

Residential and Business Deemed Savings Table

MEEIA 2025-27¹



1. MEEIA 2025-27 Demand-Side Management Plan – refers to the Company's "MEEIA Energy Efficiency Plan" as approved in File No. EO-2023-0136.

Ameren Missouri Deemed Savings Table Revision Log

Ameren Missouri Deemed Savings Table	Date	Ameren Missouri TRM			Description
		Volume 1: Overview and User Guide	Volume 2: C&I Measures	Volume 3: Residential Measures	
Revision		Revision	Revision	Revision	
1.0	05/30/2018	1.0	1.0	1.0	Initial version filed for Commission approval.
2.0	12/31/2018	1.0	1.0	2.0	Updated RES/BUS "Deemed Tables" with PY2017 Evaluation results per Stipulation and Agreement (File No. EO-2018-0211). This included updates to Volume 3 of the TRM.
3.0	01/01/2020	1.0	1.0	3.0	Updated "Deemed Tables" with PY2018 Evaluation results. Also includes revisions to HVAC measures and multifamily measures, based on feedback from evaluation contractor. This includes updates to Volume 3 of the TRM.
3.1	02/06/2020	1.0	1.0	3.0	Updated "Deemed Tables" with updates for 11 step process/program updates and minor corrections found since prior TRM update.
3.2	06/18/2020	1.0	1.1	3.0	Updated Business Deemed Table in alignment with 11 step program changes to best meet goals under current market conditions.
4.0	01/01/2021	1.0	2.0	4.0	Updated "Deemed Tables" with PY19 Evaluation results and variations of existing measures such as "direct install" and other options. Updated Appendix H & I for consistency.
5.0	09/15/2021	2.0	3.0	5.0	Updated "Deemed Tables" with PY20 Evaluation results; variations of existing measures such as non-electric heat ASHP, Lighting, Water Chillers, Home Energy Report EUL, and updated Appendix G, H and I for consistency.
6.0	09/26/2022	2.0	4.0	6.0	Updated "Deemed Tables" with PY21 Evaluation results, variations of existing measures such as DMSHP replacing non-electric heat, Advanced Thermostats in Income Eligible, Handheld Showerhead in EE Products, and Lighting Redesign w/ Network Controls, a new PTHP measure, and updated Appendix G, H and I for consistency.
7.0	10/05/2023	3.0	5.0	7.0	Updated "Deemed Tables" with PY22 Evaluation results for Res HVAC and Bus Lighting. Updated Res and Bus lighting baselines to align with EISA policy of a 45 lumen/watt efficiency. Updated Res HVAC baselines to meet CFR standard efficiency under new M1 testing protocol. Added a Pay As You Save (PAYS) program deemed table tab. Updated commercial HVAC Chiller, ASHP, and Unitary equipment baselines to reflect IECC 2015 building codes. Added a new measure to VSD Air Compressor for units between 40 and 200-hp. Updated Appendices G, H, and I for consistency.
8.0	01/15/2025	4.0	6.0	8.0	Removed measures to align with approved measure list from Commission on 01/15/25. Reviewed and updated all measures including source documentation and removed measures no longer applicable to programs offered. Implement a color coding system to identify how inputs are intended to be reviewed through evaluation activities. Updating avoided cost assumptions based on MEEIA 4 filing and 2023 IRP. Add or modify measures consistent with Appendix H & I by updating items such as savings inputs, EULs, and Incremental cost for many measures.

BUSINESS PRESCRIPTIVE MEASURES

The values in the cells highlighted in this color are values used in the planning process of the portfolio. TRM allows delivery program design to use actual values for these cells, or a default value if actuals are not available.

Cells highlighted in this color are calculated variables

Lighting

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
800050_2024_12	BSS/MFIE	LED <=11 Watt Lamp Replacing Interior Halogen A 28-52 Watt Lamp	20.75	Lighting BUS	0.0001899635	0.004068	10.0	\$3.26	per measure
800100_2024_12	BSS/MFIE	LED <=20 Watt Lamp Replacing Interior Halogen 53-70 Watt Lamp	27.77	Lighting BUS	0.0001899635	0.015246	10.0	\$3.26	per measure
800150_2024_12	BSS/MFIE	LED <=14 Watt Lamp Replacing Interior Halogen BR/R 45-65 Watt Lamp	27.67	Lighting BUS	0.0001899635	0.005424	10.0	\$3.26	per measure
800200_2024_12	BSS/MFIE	LED <=13 Watt Lamp Replacing Interior Halogen MR-16 35-50 Watt Lamp	175.07	Lighting BUS	0.0001899635	0.034321	10.0	\$3.26	per measure
800250_2024_12	BSS/MFIE	LED <=20 Watt Lamp Replacing Interior Halogen PAR 48-90 Watt Lamp	40.34	Lighting BUS	0.0001899635	0.007908	10.0	\$3.26	per measure
800300_2024_12	BSS/MFIE	LED <=80 Watt Lamp or Fixture Replacing Interior HID 100-175 Watt Lamp or Fixture	716.61	Lighting BUS	0.0001899635	0.140486	15.0	\$68.00	per measure
800350_2024_12	BSS/MFIE	LED 62 - 130 Watt Lamp or Fixture Replacing Interior HID 176-300 Watt Lamp or Fixture	798.17	Lighting BUS	0.0001899635	0.156475	15.0	\$60.00	per measure
800400_2024_12	BSS/MFIE	LED 85 - 225 Watt Lamp or Fixture Replacing Interior HID 301-500 Watt Lamp or Fixture	983.73	Lighting BUS	0.0001899635	0.122853	15.0	\$156.00	per measure
800750_2024_12	BSS/MFIE	LED or Electroluminescent Replacing Interior Incandescent/ CFL Exit Sign	243.01	Lighting BUS	0.0001899635	0.047640	7.0	\$45.25	per measure
800800_2024_12	BSS	LED Replacing Interior T5 Fluorescent (Type A / Hybrid)	290.28	Lighting BUS	0.0001899635	0.056907	10.0	\$45.25	per measure
800801_2024_12	BSS	LED Replacing Interior T5 Fluorescent (Type B, Kits, and Fixtures)	473.41	Lighting BUS	0.0001899635	0.092808	15.0	\$13.00	per measure
800850_2024_12	BSS	LED Replacing Interior T8 Fluorescent (Type A / Hybrid)	220.32	Lighting BUS	0.0001899635	0.043192	10.0	\$14.00	per measure
800851_2024_12	BSS/MFIE	LED Replacing Interior T8 Fluorescent (Type B, Kits, and Fixtures)	200.02	Lighting BUS	0.0001899635	0.039212	15.0	\$15.00	per measure
800900_2024_12	BSS	LED Replacing Interior T12 Fluorescent (Type A / Hybrid)	186.88	Lighting BUS	0.0001899635	0.036636	10.0	\$16.00	per measure
800901_2024_12	BSS	LED Replacing Interior T12 Fluorescent (Type B, Kits, and Fixtures)	254.96	Lighting BUS	0.0001899635	0.049983	15.0	\$17.00	per measure
800950_2024_12	BSS/MFIE	LED Specialty Lamp	94.51	Lighting BUS	0.0001899635	0.018528	10.0	\$18.00	per measure

Lighting Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings per unit	End Use	kW Factor	kW per unit	EUL	Inc. Cost	Units
801010_2024_12	BSS	Fixture Mounted Occupancy Sensor Controlling > 60 Watts, <200 Watts	150	Lighting BUS	0.0001899635	0.029436	10.0	\$65.00	per measure
801020_2024_12	BSS	Remote Mounted Occupancy Sensor Controlling >150 Watts	546	Lighting BUS	0.0001899635	0.107025	10.0	\$105.00	per measure

ESF =Energy Savings factor for fixture and remove controls (non NLC, LLC),(represents the percentage reduction to the operating Hours from the non-controlled baseline lighting system). Determined on a site-specific basis or use 24% as default value

Commercial Solid and Glass Door Refrigerators & Freezers

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801250_2024_12	Standard	0 < V < 15 - Vertical Closed - Solid Door Refrigerator	330	Refrigeration BUS	0.0001357383	0.0448	12.0	\$150.00	per measure
801750_2024_12	Standard	15 ≤ V < 30 - Vertical Closed - Solid Door Freezer	575	Refrigeration BUS	0.0001357383	0.0781	12.0	\$350.00	per measure
801800_2024_12	Standard	30 ≤ V < 50 - Vertical Closed - Solid Door Freezer	1,118	Refrigeration BUS	0.0001357383	0.1517	12.0	\$500.00	per measure
801850_2024_12	Standard	V ≥ 50 - Vertical Closed - Solid Door Freezer	1,504	Refrigeration BUS	0.0001357383	0.2042	12.0	\$600.00	per measure
801900_2024_12	Standard	0 < V < 15 - Vertical Closed - Glass Door Freezer	559	Refrigeration BUS	0.0001357383	0.0759	12.0	\$50.00	per measure
801950_2024_12	Standard	15 ≤ V < 30 - Vertical Closed - Glass Door Freezer	975	Refrigeration BUS	0.0001357383	0.1323	12.0	\$100.00	per measure
802000_2024_12	Standard	30 ≤ V < 50 - Vertical Closed - Glass Door Freezer	1,579	Refrigeration BUS	0.0001357383	0.2144	12.0	\$300.00	per measure
802050_2024_12	Standard	V ≥ 50 - Vertical Closed - Glass Door Freezer	3,149	Refrigeration BUS	0.0001357383	0.4275	12.0	\$500.00	per measure
801650_2024_12	Standard	Horizontal Closed - Solid Door Refrigerator - All Volumes	290	Refrigeration BUS	0.0001357383	0.0394	12.0	\$0.00	per measure
801655_2024_12	Standard	Horizontal Closed - Glass Door Refrigerator - All Volumes	172	Refrigeration BUS	0.0001357383	0.0234	12.0	\$0.00	per measure
802100_2024_12	Standard	Horizontal Closed - Solid Door Freezer - All Volumes	229	Refrigeration BUS	0.0001357383	0.0310	12.0	\$0.00	per measure

Refrigerators & Freezers Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per door)	End Use	kW Factor	kW	EUL	Inc. Cost (per door)	Units
802150_2024_12	Standard	Anti-Sweat Heater Controls Refrigerator	668.1	Refrigeration BUS	0.0001357383	0.090692	12.0	\$150.00	per door
802200_2024_12	Standard	Anti-Sweat Heater Controls Freezer	770.9	Refrigeration BUS	0.0001357383	0.104645	12.0	\$150.00	per door

Heat Pump Water Heaters

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
802250_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency 2.9-14.6 kW (10 to 50 MBH)	18,785	Water Heating BUS	0.0001811545	3.4031	15.0	\$4,000	per measure
802300_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency 14.7-29.3 kW (50 to 100 MBH)	46,913	Water Heating BUS	0.0001811545	8.8608	15.0	\$7,000	per measure
802350_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency 29.4-47.9 kW (100 to 300 MBH)	129,088	Water Heating BUS	0.0001811545	23.3848	15.0	\$10,000	per measure
802400_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency 88-146.5 kW (300 to 500 MBH)	255,265	Water Heating BUS	0.0001811545	46.2424	15.0	\$14,000	per measure
802450_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency >146.6 kW (above 500 MBH)	382,898	Water Heating BUS	0.0001811545	69.3637	15.0	\$18,000	per measure
802455_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency, ≤55 gal, medium draw	3,363	Water Heating BUS	0.0001811545	0.6093	15.0	\$18,000	per measure
802460_2024_12	Standard	Heat Pump Water Heater replacing 98% Efficiency, >55 gal and ≤ 120 gal, medium draw	5,045	Water Heating BUS	0.0001811545	0.9139	15.0	\$18,000	per measure

Electric resistance efficiency; Manufacturer data

Consumption per stored gallon × Capacity, CADWHS Study

MD 40° ground temp

SEER 13.4

Assumed if ele Conditioned space

Pool Pump

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
802600_2019_12	BSS/MFIE	Pool Pump w/ Variable Frequency Drive per HP	1,747	Motors BUS	0.0001379439	0.240588	10.00	\$246	per HP

Steam Cookers

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units	Idle_base	Idle_EE	Cooking_base	Cooking_EE	Preheat_base	Preheat_EE	Base	EE	kWh annual check
802700_2024_12	Standard	3 Pan ENERGY STAR Steam Cooker	7,383	Cooking BUS	0.0001998949	1.475876	12.0	\$2,000.00	per measure	25,814	9,811	10,267	6,160	1,776	##	37,857	17,642	7,383.3
802750_2024_12	Standard	4 Pan ENERGY STAR Steam Cooker	8,569	Cooking BUS	0.0001998949	1.712809	12.0	\$2,000.00	per measure	32,961	13,712	10,267	6,160	1,776	##	45,004	21,544	8,569
802800_2024_12	Standard	5 Pan ENERGY STAR Steam Cooker	9,693	Cooking BUS	0.0001998949	1.937577	12.0	\$2,000.00	per measure	40,005	17,678	10,267	6,160	1,776	##	52,047	25,509	9,693
802850_2024_12	Standard	6 Pan ENERGY STAR Steam Cooker	10,822	Cooking BUS	0.0001998949	2.163373	12.0	\$2,000.00	per measure	46,997	23,579	10,267	6,160	1,776	##	59,040	29,411	10,822

Holding Cabinet

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
802900_2024_12	Standard	ENERGY STAR Hot Holding Cabinet (0 < V <13)	326	Cooking BUS	0.0001998949	0.065164	12.00	\$1,000.00	per measure
802950_2024_12	Standard	ENERGY STAR Hot Holding Cabinet (13 ≤ V <28)	1,677	Cooking BUS	0.0001998949	0.335124	12.00	\$1,000.00	per measure
803000_2024_12	Standard	ENERGY STAR Hot Holding Cabinet (28 ≤ V)	2,904	Cooking BUS	0.0001998949	0.580553	12.00	\$1,000.00	per measure

ENERGY STAR CFS Equipment calculator base is 30W per cubic ft

BUSINESS PRESCRIPTIVE MEASURES

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HVAC

Measure Reference No.	Program/ Channel	Measure	Total kWh Annual Savings per ton	Cooling kWh Annual Savings (per Ton)	Heating kWh Annual Savings (per ton)	End Use	End Use	kW Factor	kW	EUL	Inc. Cost	Units
803050_2024_12	BSS/Standard	Learning Thermostat, cooling and electric heat, per ton	0.0	0.00	0.0	Cooling BUS	Heating BUS	0.0009106840	0.000000	9.00	106	per ton
803060_2024_12	BSS/Standard	Learning Thermostat, cooling, per ton	0.0	0.0	0.0	Cooling BUS	Heating BUS	0.0009106840	0.000000	9.00	106	per ton

St Louis all building types Under 65k BTU/h federal stoverage Cadmus Study St Louis all building types Electric resistance and Heat Pump avg Cadmus Study Ameren MO DSM 2019 to 2024 self report

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per HP)	Units
803100_2024_12	BSS/Standard	VFD on Chilled Water Pump >= 1HP, per Hp	1,362.3	Cooling BUS	0.0009106840	1.240643	15.00	\$360.00	per Hp
803150_2024_12	Standard	VFD on Hot Water Pump >= 1HP	1,181.0	HVAC BUS	0.0004439830	0.534348	15.00	\$360.00	per Hp
803155_2024_12	Standard	VFD on Condenser Water Pump >= 1HP	1,362.3	Cooling BUS	0.0009106840	1.240643	15.00	\$360.00	per Hp
803160_2024_12	Standard	VFD on Cooling Tower Fan >= 1HP	1,910.3	HVAC BUS	0.0004439830	0.848141	15.00	\$360.00	per Hp

TRM 2.8.5 table Annual TRM 2.8.5 table ESF for Incremental cost = 300x HP +\$1500

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per HP)	Units
803200_2024_12	BSS/Standard	VFD on HVAC Fans >= 1HP	939.75	HVAC BUS	0.0004439830	0.417233	15.00	\$360.00	per Hp

Incremental cost = 300x HP +\$1500

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings per ton	End Use	kW Factor	kW	EUL	Inc. Cost	Units
803250_2024_12	BSS/Standard	Single Package or Split System Unitary AC, DX 135 - 240kbtu	118	Cooling BUS	0.0009106840	0.107215	15.0	\$218.40	per ton
803300_2024_12	BSS/Standard	Single Package or Split System Unitary AC, DX 240 - 760kBTU/h	179	Cooling BUS	0.0009106840	0.163267	15.0	\$305.76	per ton
803350_2024_12	BSS/Standard	Single Package or Split System Unitary AC, DX 65 -135kBTU/h	102	Cooling BUS	0.0009106840	0.093290	15.0	\$203.84	per ton
803400_2024_12	BSS/Standard	Single Package or Split System Unitary AC, DX >760kBTU/h	10	Cooling BUS	0.0009106840	0.009426	15.0	\$10.40	per ton
803450_2024_12	BSS/Standard	Single Package or Split System Unitary AC, DX <65kBTU/h	150	Cooling BUS	0.0009106840	0.136384	15.0	\$263.12	per ton

2023 DOE Federal Efficiency <65kBTU/h certified Energy Star average 15.93 light commercial; AHRI directory weighted average for 240 to 760 kBTU/h is IEER 15.94, 65 to 135 kBTU/h is IEER 16.5, 135 to 240 kBTU/h is IEER 16.1

Measure Reference No.	Program/ Channel	Measure (Geothermal, Water Source & Air Source Heat Pumps)	Total kWh Annual Savings	Cooling kWh Annual Savings (per ton)	Heating kWh Annual Savings (per ton)	End Use	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803500_2024_12	Standard	GSHP	526.24	430.90	95.34	Cooling BUS	Heating BUS	0.0009106840	0.392414	15.0	\$416.00	per ton
803570_2024_12	Standard	WSHP <17 kBTU/h per ton	291.85	253.32	38.53	Cooling BUS	Heating BUS	0.0009106840	0.230694	15.0	\$208.00	per ton
803575_2024_12	Standard	WSHP ≥17 kBTU/h and <65 kBTU/h per ton	228.12	189.59	38.53	Cooling BUS	Heating BUS	0.0009106840	0.172657	15.0	\$208.00	per ton
803580_2024_12	Standard	WSHP ≥65kBTU/h and <135 kBTU/h per ton	228.12	189.59	38.53	Cooling BUS	Heating BUS	0.0009106840	0.172657	15.0	\$208.00	per ton
803600_2024_12	BSS/Standard	ASHP ≥65kBTU/h and <135 kBTU/h per ton	169.55	117.34	52.21	Cooling BUS	Heating BUS	0.0009106840	0.106660	15.0	\$214.24	per ton
803650_2024_12	Standard	ASHP ≥135kBTU/h and <240 kBTU/h per ton	204.58	168.14	36.44	Cooling BUS	Heating BUS	0.0009106840	0.153122	15.0	\$297.44	per ton
803700_2024_12	BSS/Standard	ASHP ≥240kBTU/h per ton	386.42	327.65	58.77	Cooling BUS	Heating BUS	0.0009106840	0.298386	15.0	\$416.00	per ton
803750_2024_12	BSS/Standard	ASHP <65kBTU/h per ton	223.37	158.14	65.23	Cooling BUS	Heating BUS	0.0009106840	0.144016	15.0	\$280.80	per ton

2023 DOE Federal Standard

2023 DOE Federal Stan 2024 AHRI weighted average and 2024 ENER 2023 DOE Federal Stan 2024 AHRI weig 2023 DOE Feder 2024 AHRI weighted average and 2024 ENERGY STAR

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per ton)	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803800_2024_12	BSS/Standard	Air Cooled Chiller	321.48	Cooling BUS	0.0009106840	0.292767	23.0	\$854.83	per ton
803810_2024_12	Standard	Water Cooled Chiller	113.72	Cooling BUS	0.0009106840	0.103563	23.0	\$378.00	per ton

Compressed Air

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
804300_2024_12	Standard	No Loss Condensate Drain (Reciprocating - On/off Control)	3,272	Air Comp BUS	0.0001379439	0.451388	13.00	\$778.00	per measure
804350_2024_12	Standard	No Loss Condensate Drain (Reciprocating - Load/Unload)	2,419	Air Comp BUS	0.0001379439	0.333634	13.00	\$778.00	per measure
804400_2024_12	Standard	No Loss Condensate Drain (Screw - Load/Unload)	2,703	Air Comp BUS	0.0001379439	0.372886	13.00	\$778.00	per measure
804450_2024_12	Standard	No Loss Condensate Drain (Screw - Inlet Modulation)	978	Air Comp BUS	0.0001379439	0.134926	13.00	\$778.00	per measure
804500_2024_12	Standard	No Loss Condensate Drain (Screw - Inlet Modulation w/ Unloading)	978	Air Comp BUS	0.0001379439	0.134926	13.00	\$778.00	per measure
804550_2024_12	Standard	No Loss Condensate Drain (Screw - Variable Displacement)	2,721	Air Comp BUS	0.0001379439	0.375338	13.00	\$778.00	per measure
804600_2024_12	Standard	No Loss Condensate Drain (Screw - VFD)	3,166	Air Comp BUS	0.0001379439	0.436668	13.00	\$778.00	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
804650_2024_12	Standard	Compressed Air Nozzle (Reciprocating - On/off Control)	1,633	Air Comp BUS	0.0001379439	0.225284	15.00	\$59	per measure
804700_2024_12	Standard	Compressed Air Nozzle (Reciprocating - Load/Unload)	1,209	Air Comp BUS	0.0001379439	0.166711	15.00	\$59	per measure
804750_2024_12	Standard	Compressed Air Nozzle (Screw - Load/Unload)	1,192	Air Comp BUS	0.0001379439	0.164458	15.00	\$59	per measure
804800_2024_12	Standard	Compressed Air Nozzle (Screw - Inlet Modulation)	474	Air Comp BUS	0.0001379439	0.065333	15.00	\$59	per measure
804850_2024_12	Standard	Compressed Air Nozzle (Screw - Inlet Modulation w/ slowdown)	1,209	Air Comp BUS	0.0001379439	0.166711	15.00	\$59	per measure
804900_2024_12	Standard	Compressed Air Nozzle (Screw - Variable Displacement)	980	Air Comp BUS	0.0001379439	0.135171	15.00	\$59	per measure
804950_2024_12	Standard	Compressed Air Nozzle (Screw - VFD)	1,584	Air Comp BUS	0.0001379439	0.218527	15.00	\$59	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost per HP	Units
805000_2024_12	Standard	VSD Air Compressor 5-40 HP	949.4	Air Comp BUS	0.0001379439	0.130961	10.00	\$202	per HP
805001_2024_12	Standard	VSD Air Compressor >40-≤50 HP	949.4	Air Comp BUS	0.0001379439	0.130961	10.00	\$202	per HP
805002_2024_12	Standard	VSD Air Compressor 50-200 HP	1,052.0	Air Comp BUS	0.0001379439	0.145120	10.00	\$202	per HP

Incremental Cost (\$) = ((127 x hp_{compressor}) + 1446) x 1.43

Kitchen Demand Ventilation Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per Hp)	Units
805405_2020_07	Standard	Kitchen Demand Ventilation Controls, Retrofit	4,197.00	Cooking BUS	0.0001998949	0.838959	15.0	\$1,991.00	per HP

BUSINESS PRESCRIPTIVE MEASURES

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Cells highlighted in this color are calculated variables

Demand Controlled Ventilation

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per sqft)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805650_2019_12	Standard	Demand Controlled Ventilation (Gas Heat)	0.67	Cooling BUS	0.0009106840	0.00061	10.00	Actual	per sq. ft.
805700_2019_12	Standard	Demand Controlled Ventilation (Electric Heat)	1.90	Cooling BUS	0.0009106840	0.00173	10.00	Actual	per sq. ft.
805750_2019_12	Standard	Demand Controlled Ventilation (Heat Pump)	1.08	Cooling BUS	0.0009106840	0.000984	10.00	Actual	per sq. ft.

Advanced RTU Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per unit)	Units
805800_2019_12	Standard	Advanced RTU Controls	3,779.33	HVAC BUS	0.0004439830	1.677958	15.0	\$4,038.00	per measure

High Volume Low Speed Fans

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per measure)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
806090_2024_12	Standard	High Volume Low Speed Fan, 16	3,218.0	HVAC BUS	0.0004439830	1.4287	10.0	\$4,072.00	per measure
806095_2024_12	Standard	High Volume Low Speed Fan, 18	4,938.0	HVAC BUS	0.0004439830	2.1924	10.0	\$4,110.00	per measure
806100_2020_07	Standard	High Volume Low Speed Fan, 20	6,577.0	HVAC BUS	0.0004439830	2.9201	10.0	\$4,150.00	per measure
806110_2020_07	Standard	High Volume Low Speed Fan, 22	8,543.0	HVAC BUS	0.0004439830	3.7929	10.0	\$4,180.00	per measure
806120_2020_07	Standard	High Volume Low Speed Fan, 24	10,018.0	HVAC BUS	0.0004439830	4.4478	10.0	\$4,225.00	per measure

Custom Measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per motor)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
999999_2024_12	Custom	Custom-Air Comp	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Building Shell	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Cooking	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Cooling	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-HVAC	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Lighting (Controls)	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Miscellaneous	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Motors	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Process	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Refrigeration	Custom	Variable	Variable	Custom	Custom	Custom	Custom
999999_2024_12	Custom	Custom-Water Heating	Custom	Variable	Variable	Custom	Custom	Custom	Custom

RESIDENTIAL EFFICIENT PRODUCTS

Heat Pump Water Heater

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kWh _{cool}	kWh _{heat} - Unknown	kWh _{heat} - Electric Resistance	kWh _{heat} - Heat Pumps	kW	EUL	Inc. Cost	Units
250050_2024_12_	MFIE	Heat Pump Hot Water Heater	2,396.26	Water Heating RES	0.0000887318	380.52	187.07	152.66	113.43	0.212624	13.0	\$1,199.00	per measure

Learning Thermostat / Advanced Thermostat

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
250100_2024_12_	PAYS/SFIE	Learning Thermostat - ASHP heating/cooling SF	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250100_2024_12_	PAYS/SFIE	Learning Thermostat - ASHP heating/cooling SF	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250101_2024_12_	MFIE	Learning Thermostat - ASHP heating/cooling MF	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250101_2024_12_	MFIE	Learning Thermostat - ASHP heating/cooling MF	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250150_2024_12_	MFIE	Learning Thermostat - electric furnace heating / central AC MF	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250150_2024_12_	MFIE	Learning Thermostat - electric furnace heating / central AC MF	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250250_2024_12_	PAYS/SFIE	Learning Thermostat - electric furnace heating / central AC SF	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250250_2024_12_	PAYS/SFIE	Learning Thermostat - electric furnace heating / central AC SF	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250350_2024_12_	PAYS/SFIE	Learning Thermostat - Gas Heated / central AC SF**	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250350_2024_12_	PAYS/SFIE	Learning Thermostat - Gas Heated / central AC SF**	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250351_2024_12_	MFIE	Learning Thermostat - Gas Heated / central AC MF**	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250351_2024_12_	MFIE	Learning Thermostat - Gas Heated / central AC MF**	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure
250450_2024_12_	Smart Thermostats	Learning Thermostat - Unknown SF**	0.00	Cooling RES	0.0009474181	0.000000	11.0	\$79.00	per measure
250450_2024_12_	Smart Thermostats	Learning Thermostat - Unknown SF**	0.00	Heating RES	0.0000000000	0.000000	11.0		per measure

Lighting

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
251530_2024_12_	MFIE	LED Nightlights	23.24	Lighting RES	0.0001492529	0.003469	8.0	\$3.35	per measure

RESIDENTIAL ENERGY EFFICIENCY KITS

Dirty Filter Alarm

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units
300100_2024_12_	MFIE	Dirty Filter Alarm_MF	118.25	HVAC RES	0.0004660805	74.80	43.45	0.055114	5.0	\$5.00	per measure

LEDs (per bulb)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
300431_2024_12_	SFIE	LED - 10W (750-899 lumens) IE	30.06	Lighting RES	0.0001492529	0.004487	8.0	\$1.45	per measure

PAY AS YOU SAVE

LED Lamp

Measure Reference No.	Program/ Channel	Measure *	kWh Annual Savings	kW	End Use - RES	kW Factor - RES	End Use - BUS	kW Factor - BUS	kWh RES	kWh BUS	KW RES	KW BUS	EUL - RES	EUL - BUS**	Inc. Cost	Units
450100_2024_12_	PAYS	LED - 10W (750-899 lumens) DI	29.57	0.004414	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	29.57	0.00	0.0044	0.0000	2.0	0.0	\$ 1.45	per bulb

Advanced Power Strips Tier 1 / Load Sensing

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
450700_2024_12_	PAYS	Advanced Tier 1 Power Strips DI - Home	23.030	Miscellaneous RES	0.0001148238	0.002644	10.0	\$30.00	per measure

RESIDENTIAL HVAC

Central Air Conditioners

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
350600_2024_12_	PAYS	CAC-SEER15_ER1_SF	2,107.99	Cooling RES	0.0009474181	1.997148	6	\$526.97	3.11
350600_2024_12_	PAYS	CAC-SEER15_ER2_SF	273.32	Cooling RES ER2	0.0009474181	0.258948	12	\$0.00	3.11
350650_2024_12_	PAYS	CAC-SEER15_ROF_SF	262.90	Cooling RES	0.0009474181	0.249076	18	\$453.03	2.99
350800_2024_12_	PAYS/SFIE	CAC-SEER16_ER1_SF	2,184.27	Cooling RES	0.0009474181	2.069417	6	\$708.93	2.88
350800_2024_12_	PAYS/SFIE	CAC-SEER16_ER2_SF	366.69	Cooling RES ER2	0.0009474181	0.347409	12	\$0.00	2.88
350850_2024_12_	PAYS/SFIE	CAC-SEER16_ROF_SF	363.43	Cooling RES	0.0009474181	0.344320	18	\$634.98	2.85
350900_2024_12_	MFIE	CAC-SEER16_ER1_MF	1,902.85	Cooling RES	0.0009474181	1.802795	6	\$708.93	2.54
350900_2024_12_	MFIE	CAC-SEER16_ER2_MF	324.05	Cooling RES ER2	0.0009474181	0.307011	12	\$0.00	2.54
351000_2024_12_	PAYS/SFIE	CAC-SEER17_ER1_SF	2,381.95	Cooling RES	0.0009474181	2.256703	6	\$965.15	3.17
351000_2024_12_	PAYS/SFIE	CAC-SEER17_ER2_SF	530.38	Cooling RES ER2	0.0009474181	0.502492	12	\$0.00	3.17
351050_2024_12_	PAYS/SFIE	CAC-SEER17_ROF_SF	549.48	Cooling RES	0.0009474181	0.520587	18	\$891.20	3.30
351160_2024_12_	PAYS/SFIE	CAC-SEER18_ER1_SF	2,517.94	Cooling RES	0.0009474181	2.385542	6	\$994.85	3.33
351160_2024_12_	PAYS/SFIE	CAC-SEER18_ER2_SF	662.17	Cooling RES ER2	0.0009474181	0.627352	12	\$0.00	3.33
351161_2024_12_	PAYS/SFIE	CAC-SEER18_ROF_SF	660.62	Cooling RES	0.0009474181	0.625883	18	\$920.91	3.33
351170_2024_12_	PAYS/SFIE	CAC-SEER19_ER1_SF	3,468.74	Cooling RES	0.0009474181	3.286347	6	\$994.85	4.30
351170_2024_12_	PAYS/SFIE	CAC-SEER19_ER2_SF	1,002.03	Cooling RES ER2	0.0009474181	0.949341	12	\$0.00	4.30
351171_2024_12_	PAYS/SFIE	CAC-SEER19_ROF_SF	1,037.44	Cooling RES	0.0009474181	0.982889	18	\$920.91	4.43
351180_2024_12_	PAYS/SFIE	CAC-SEER20_ER1_SF	2,828.06	Cooling RES	0.0009474181	2.679355	6	\$1,080.26	3.61
351180_2024_12_	PAYS/SFIE	CAC-SEER20_ER2_SF	935.32	Cooling RES ER2	0.0009474181	0.886139	12	\$0.00	3.61
351181_2024_12_	PAYS/SFIE	CAC-SEER20_ROF_SF	968.73	Cooling RES	0.0009474181	0.917792	18	\$1,006.32	3.77
351190_2024_12_	PAYS/SFIE	CAC-SEER21+_ER1_SF	2,724.14	Cooling RES	0.0009474181	2.580900	6	\$1,193.52	3.30
351190_2024_12_	PAYS/SFIE	CAC-SEER21+_ER2_SF	1,010.53	Cooling RES ER2	0.0009474181	0.957394	12	\$0.00	3.30
351191_2024_12_	PAYS/SFIE	CAC-SEER21+_ROF_SF	1,067.57	Cooling RES	0.0009474181	1.011435	18	\$1,240.26	3.38

Mini/Multi-Split Heat Pumps and Air Conditioners

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351200_2024_12_	PAYS	Mini/MultiSplitAC_ER1_SF	1,227.25	Cooling RES	0.0009474181	1.162719	6.0	\$683.92	1.75
351200_2024_12_	PAYS	Mini/MultiSplitAC_ER2_SF	322.80	Cooling RES ER2	0.0009474181	0.305827	12.0	\$0.00	
351250_2024_12_	PAYS	Mini/MultiSplitAC_ROF_SF	240.28	Cooling RES	0.0009474181	0.227646	18.0	\$543.71	1.06
351300_2024_12_	PAYS	Mini/MultiSplitASHP_ROF_SF_NC	251.78	Cooling RES	0.0009474181	0.238541	18.0	\$543.71	1.33
351300_2024_12_	PAYS	Mini/MultiSplitASHP_ROF_SF_NC	916.80	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351350_2024_12_	PAYS	Mini/MultiSplitASHP_ROF_SF	251.78	Cooling RES	0.0009474181	0.238541	18.0	\$543.71	1.33
351350_2024_12_	PAYS	Mini/MultiSplitASHP_ROF_SF	916.80	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351400_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF	1,157.84	Cooling RES	0.0009474181	1.096959	6.0	\$626.50	1.92
351400_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF	4,740.51	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351400_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_SF	429.94	Cooling RES ER2	0.0009474181	0.407333	12.0	\$0.00	
351400_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_SF	4,740.51	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351401_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF	1,157.84	Cooling RES	0.0009474181	1.096959	6.0	\$89.87	1.92
351401_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351401_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_SF	429.94	Cooling RES ER2	0.0009474181	0.407333	12.0	\$0.00	
351401_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351450_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF	299.32	Cooling RES	0.0009474181	0.283581	18.0	\$543.71	1.33
351450_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF	4,143.51	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351451_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF	299.32	Cooling RES	0.0009474181	0.283581	18.0	\$36.63	1.33
351451_2024_12_	PAYS	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351500_2024_12_	PAYS	Mini/MultiSplitASHP_ER1_SF	1,157.84	Cooling RES	0.0009474181	1.096959	6.0	\$683.92	1.92
351500_2024_12_	PAYS	Mini/MultiSplitASHP_ER1_SF	1,456.32	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351500_2024_12_	PAYS	Mini/MultiSplitASHP_ER2_SF	361.07	Cooling RES ER2	0.0009474181	0.342084	12.0	\$0.00	
351500_2024_12_	PAYS	Mini/MultiSplitASHP_ER2_SF	1,022.43	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351550_2024_12_	MFIE	Mini/MultiSplitAC_ER1_MF	1,402.57	Cooling RES	0.0009474181	1.328820	6.0	#N/A	1.75
351550_2024_12_	MFIE	Mini/MultiSplitAC_ER2_MF	368.91	Cooling RES ER2	0.0009474181	0.349512	12.0	\$0.00	

RESIDENTIAL HVAC

Dual Fuel Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351900_2024_12_	PAYS	DFHP-SEER19-ROF_MF	398.66	Cooling Res	0.0009474181	0.377698	18.0	\$1,081.00	3.4
351900_2024_12_	PAYS	DFHP-SEER19-ROF_MF	545.76	Heating Res	0.0000000000	0.000000	18.0		
351950_2024_12_	PAYS	DFHP-SEER20-ROF_MF	594.40	Cooling Res	0.0009474181	0.563145	18.0	\$1,081.00	4.4
351950_2024_12_	PAYS	DFHP-SEER20-ROF_MF	876.06	Heating Res	0.0000000000	0.000000	18.0		
352000_2024_12_	PAYS	DFHP-SEER21-ROF_MF	816.63	Cooling Res	0.0009474181	0.773690	18.0	\$1,081.00	5.4
352000_2024_12_	PAYS	DFHP-SEER21-ROF_MF	1,268.10	Heating Res	0.0000000000	0.000000	18.0		

Ground Source Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
352050_2024_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF	1,606.94	Cooling Res	0.0009474181	1.522444	18.0	\$10,389.88	3.99
352050_2021_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF	16,223.39	Heating RES	0.0000000000	0.000000	18.0		
352100_2024_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF	4,725.70	Cooling Res	0.0009474181	4.477214	6.0	\$10,005.78	3.87
352100_2024_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF	15,784.45	Heating RES	0.0000000000	0.000000	6.0		
352100_2024_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ER2_SF	1,557.33	Cooling Res ER2	0.0009474181	1.475443	12.0		
352100_2024_12_	PAYS	GSHP-EER23-Replace_CAC_ElectricHeat_ER2_SF	15,784.45	Heating RES ER2	0.0000000000	0.000000	12.0		
352200_2024_12_	PAYS	GSHP-EER23-Replace_ASHP_ER1_SF	4,385.85	Cooling Res	0.0009474181	4.155234	6.0	\$6,248.64	3.87
352200_2024_12_	PAYS	GSHP-EER23-Replace_ASHP_ER1_SF	4,674.40	Heating RES	0.0000000000	0.000000	6.0		
352200_2024_12_	PAYS	GSHP-EER23-Replace_ASHP_ER2_SF	1,367.79	Cooling Res ER2	0.0009474181	1.295869	12.0		
352200_2024_12_	PAYS	GSHP-EER23-Replace_ASHP_ER2_SF	4,674.40	Heating RES ER2	0.0000000000	0.000000	12.0		
352250_2024_12_	PAYS	GSHP-EER23_ROF_SF	1,411.37	Cooling Res	0.0009474181	1.337157	18.0	\$7,508.89	3.99
352250_2021_12_	PAYS	GSHP-EER23_ROF_SF	4,804.39	Heating RES	0.0000000000	0.000000	18.0		
352260_2024_12_	PAYS	GSHP-EER23-Replace_GSHP_ER1_SF	1,557.33	Cooling Res	0.0009474181	1.475443	6.0	\$6,248.64	3.87
352260_2024_12_	PAYS	GSHP-EER23-Replace_GSHP_ER1_SF	4,674.40	Heating RES	0.0000000000	0.000000	6.0		
352260_2024_12_	PAYS	GSHP-EER23-Replace_GSHP_ER2_SF	1,367.79	Cooling Res ER2	0.0009474181	1.295869	12.0		
352260_2024_12_	PAYS	GSHP-EER23-Replace_GSHP_ER2_SF	4,674.40	Heating RES ER2	0.0000000000	0.000000	12.0		

RESIDENTIAL HVAC

Air Source Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
352300 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$3,236.32	2.6
352300 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF	8,299.22	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352300 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_SF	266.32	Cooling Res ER2	0.0009474181	0.252316	12.0	\$0.00	
352300 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_SF	8,299.22	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352310 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$389.45	2.6
352310 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352310 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_SF	266.32	Cooling Res ER2	0.0009474181	0.252316	12.0	\$0.00	
352310 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352350 2024 12	PAYS	ASHP-SEER15_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$131.70	2.6
352350 2024 12	PAYS	ASHP-SEER15_ER1_SF	1,774.34	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352350 2024 12	PAYS	ASHP-SEER15_ER2_SF	119.46	Cooling Res ER2	0.0009474181	0.113179	12.0	\$0.00	
352350 2024 12	PAYS	ASHP-SEER15_ER2_SF	913.36	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352400 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF	273.67	Cooling Res	0.0009474181	0.259280	18.0	\$3,334.60	2.8
352400 2024 12	PAYS	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF	8,958.99	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352410 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF	273.67	Cooling Res	0.0009474181	0.259280	18.0	\$98.84	2.8
352410 2024 12	PAYS	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352500 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF	2,150.16	Cooling Res	0.0009474181	2.037101	6.0	\$3,497.35	2.5
352500 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF	8,346.27	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352500 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_SF	387.42	Cooling Res ER2	0.0009474181	0.367049	12.0	\$0.00	
352500 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_SF	8,346.27	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352510 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF	2,150.16	Cooling Res	0.0009474181	2.037101	6.0	\$461.51	2.5
352510 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352510 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_SF	387.42	Cooling Res ER2	0.0009474181	0.367049	12.0	\$0.00	
352510 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352550 2024 12	PAYS/SFIE	ASHP-SEER16_ER1_SF	2,150.16	Cooling Res	0.0009474181	2.037101	6.0	\$417.68	2.5
352550 2024 12	PAYS/SFIE	ASHP-SEER16_ER1_SF	1,926.94	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352550 2024 12	PAYS/SFIE	ASHP-SEER16_ER2_SF	239.74	Cooling Res ER2	0.0009474181	0.227134	12.0	\$0.00	
352550 2024 12	PAYS/SFIE	ASHP-SEER16_ER2_SF	1,079.89	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352600 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF	394.62	Cooling Res	0.0009474181	0.373870	18.0	\$3,623.26	2.8
352600 2024 12	PAYS/SFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF	9,173.07	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352610 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF	394.62	Cooling Res	0.0009474181	0.373870	18.0	\$149.44	2.8
352610 2024 12	PAYS	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352650 2024 12	PAYS/SFIE	ASHP-SEER16_ROF_SF	244.06	Cooling Res	0.0009474181	0.231227	18.0	\$421.00	2.8
352650 2024 12	PAYS/SFIE	ASHP-SEER16_ROF_SF	1,104.55	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353000 2024 12	MFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF	2,088.3	Cooling Res	0.0009474181	1.978484	6.0	\$3,682.06	2.8
353000 2024 12	MFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF	9,445.7	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353000 2024 12	MFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF	400.5	Cooling Res ER2	0.0009474181	0.379394	12.0	\$0.00	
353000 2024 12	MFIE	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF	9,445.7	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF	510.45	Cooling Res	0.0009474181	0.483610	18.0	\$4,073.20	3.2
353100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF	10,794.65	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF	510.45	Cooling Res	0.0009474181	0.483610	18.0	\$183.91	3.2
353110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353200 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF	700.49	Cooling Res	0.0009474181	0.663657	18.0	\$4,172.22	3.0
353200 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF	10,358.22	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353210 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF	700.49	Cooling Res	0.0009474181	0.663657	18.0	\$264.28	3.0
353210 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353300 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF	838.11	Cooling Res	0.0009474181	0.794041	18.0	\$4,392.22	3.0
353300 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF	10,441.58	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353310 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	838.11	Cooling Res	0.0009474181	0.794041	18.0	\$326.35	3.0
353310 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353400 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	2,257.71	Cooling Res	0.0009474181	2.138995	6.0	\$4,188.75	2.6
353400 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	9,124.58	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353400 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_SF	758.63	Cooling Res ER2	0.0009474181	0.718740	12.0	\$0.00	
353400 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_SF	9,124.58	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353410 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	2,257.71	Cooling Res	0.0009474181	2.138995	6.0	\$594.14	2.6
353410 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353410 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_SF	758.63	Cooling Res ER2	0.0009474181	0.718740	12.0	\$0.00	
353410 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353450 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	823.65	Cooling Res	0.0009474181	0.780341	18.0	\$4,329.25	2.9
353450 2024 12	PAYS/SFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	10,217.26	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

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Air Source Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
353460 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	823.65	Cooling Res	0.0009474181	0.780341	18.0	\$322.96	2.9
353460 2024 12	PAYS	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353550 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	2,498.89	Cooling Res	0.0009474181	2.367494	6.0	\$4,645.17	3.3
353550 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	12,022.15	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353550 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_SF	963.47	Cooling Res ER2	0.0009474181	0.912809	12.0	\$0.00	
353550 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_SF	12,022.15	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353560 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	2,498.89	Cooling Res	0.0009474181	2.367494	6.0	\$584.70	3.3
353560 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353560 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_SF	963.47	Cooling Res ER2	0.0009474181	0.912809	12.0	\$0.00	
353560 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353600 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	1,521.91	Cooling Res	0.0009474181	1.441885	6.0	\$3,847.73	3.1
353600 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353600 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF	567.50	Cooling Res ER2	0.0009474181	0.537660	12.0	\$0.00	
353600 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353650 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	981.12	Cooling Res	0.0009474181	0.929531	18.0	\$4,678.97	3.5
353650 2024 12	PAYS/SFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	12,395.99	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353660 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	981.12	Cooling Res	0.0009474181	0.929531	18.0	\$343.17	3.5
353660 2024 12	PAYS	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353750 2024 12	PAYS/SFIE	ASHP-SEER17_ER1_SF	2,226.27	Cooling Res	0.0009474181	2.109208	6.0	\$626.73	2.7
353750 2024 12	PAYS/SFIE	ASHP-SEER17_ER1_SF	2,214.40	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353750 2024 12	PAYS/SFIE	ASHP-SEER17_ER2_SF	367.16	Cooling Res ER2	0.0009474181	0.347854	12.0	\$0.00	
353750 2024 12	PAYS/SFIE	ASHP-SEER17_ER2_SF	1,324.07	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353800 2024 12	PAYS/SFIE	ASHP-SEER17_ROF_SF	363.52	Cooling Res	0.0009474181	0.344405	18.0	\$630.00	3.2
353800 2024 12	PAYS/SFIE	ASHP-SEER17_ROF_SF	1,573.28	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353850 2024 12	PAYS/SFIE	ASHP-SEER18_ER1_SF	2,592.93	Cooling Res	0.0009474181	2.456589	6.0	\$851.83	2.9
353850 2024 12	PAYS/SFIE	ASHP-SEER18_ER1_SF	2,716.07	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353850 2024 12	PAYS/SFIE	ASHP-SEER18_ER2_SF	503.51	Cooling Res ER2	0.0009474181	0.477034	12.0	\$0.00	
353850 2024 12	PAYS/SFIE	ASHP-SEER18_ER2_SF	1,748.17	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353950 2024 12	PAYS/SFIE	ASHP-SEER18_ROF_SF	528.75	Cooling Res	0.0009474181	0.500947	18.0	\$855.00	3.0
353950 2024 12	PAYS/SFIE	ASHP-SEER18_ROF_SF	1,739.62	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354000 2024 12	PAYS/SFIE	ASHP-SEER19_ER1_SF	2,563.17	Cooling Res	0.0009474181	2.428394	6.0	\$1,078.20	3.8
354000 2024 12	PAYS/SFIE	ASHP-SEER19_ER1_SF	3,575.55	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354000 2024 12	PAYS/SFIE	ASHP-SEER19_ER2_SF	667.18	Cooling Res ER2	0.0009474181	0.632098	12.0	\$0.00	
354000 2024 12	PAYS/SFIE	ASHP-SEER19_ER2_SF	2,312.81	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354050 2024 12	PAYS/SFIE	ASHP-SEER19_ROF_SF	665.33	Cooling Res	0.0009474181	0.630346	18.0	\$1,081.00	3.0
354050 2024 12	PAYS/SFIE	ASHP-SEER19_ROF_SF	1,851.70	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	2,226.27	Cooling Res	0.0009474181	2.109208	6.0	\$3,783.95	2.7
354100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	8,961.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_SF	511.12	Cooling Res ER2	0.0009474181	0.484244	12.0	\$0.00	
354100 2024 12	PAYS/SFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_SF	8,961.76	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	2,226.27	Cooling Res	0.0009474181	2.109208	6.0	\$501.34	2.7
354110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_SF	511.12	Cooling Res ER2	0.0009474181	0.484244	12.0	\$0.00	
354110 2024 12	PAYS	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354150 2024 12	MFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	1,286.47	Cooling Res	0.0009474181	1.218825	6.0	\$3,396.73	3.1
354150 2024 12	MFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354150 2024 12	MFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF	332.07	Cooling Res ER2	0.0009474181	0.314609	12.0	\$0.00	
354150 2024 12	MFIE	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354200 2024 12	MFIE	ASHP-SEER17_ER1_MF	1,369.47	Cooling Res	0.0009474181	1.297461	6.0	\$626.52	3.3
354200 2024 12	MFIE	ASHP-SEER17_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354200 2024 12	MFIE	ASHP-SEER17_ER2_MF	248.43	Cooling Res ER2	0.0009474181	0.235367	12.0	\$0.00	
354200 2024 12	MFIE	ASHP-SEER17_ER2_MF	1,080.90	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354250 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	2,592.93	Cooling Res	0.0009474181	2.456589	6.0	\$4,148.01	2.9
354250 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	10,051.22	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354250 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_SF	666.45	Cooling Res ER2	0.0009474181	0.631407	12.0	\$0.00	
354250 2024 12	PAYS/SFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_SF	10,051.22	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354260 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	2,592.93	Cooling Res	0.0009474181	2.456589	6.0	\$578.72	2.9
354260 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354260 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_SF	666.45	Cooling Res ER2	0.0009474181	0.631407	12.0	\$0.00	
354260 2024 12	PAYS	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

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Air Source Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
354300 2024 12	MFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	2,018.52	Cooling Res	0.0009474181	1.912382	6.0	\$3,312.73	1.5
354300 2024 12	MFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	5,203.97	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354300 2024 12	MFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF	298.31	Cooling Res ER2	0.0009474181	0.282624	12.0	\$0.00	
354300 2024 12	MFIE	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF	5,203.97	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354350 2024 12	MFIE	ASHP-SEER18_ER1_MF	2,464.77	Cooling Res	0.0009474181	2.335168	6.0	\$851.67	2.5
354350 2024 12	MFIE	ASHP-SEER18_ER1_MF	2,332.67	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354350 2024 12	MFIE	ASHP-SEER18_ER2_MF	374.74	Cooling Res ER2	0.0009474181	0.355035	12.0	\$0.00	
354350 2024 12	MFIE	ASHP-SEER18_ER2_MF	1,496.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354400 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	2,563.17	Cooling Res	0.0009474181	2.428394	6.0	\$4,902.60	3.8
354400 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	13,145.12	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354400 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_SF	842.88	Cooling Res ER2	0.0009474181	0.798560	12.0	\$0.00	
354400 2024 12	PAYS/SFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_SF	13,145.12	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354410 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	2,563.17	Cooling Res	0.0009474181	2.428394	6.0	\$550.40	3.6
354410 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354410 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_SF	842.88	Cooling Res ER2	0.0009474181	0.798560	12.0	\$0.00	
354410 2024 12	PAYS	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354450 2024 12	MFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	1,416.58	Cooling Res	0.0009474181	1.342094	6.0	\$3,847.73	3.1
354450 2024 12	MFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354450 2024 12	MFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF	462.17	Cooling Res ER2	0.0009474181	0.437868	12.0	\$0.00	
354450 2024 12	MFIE	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354500 2024 12	MFIE	ASHP-SEER19_ER1_MF	1,507.97	Cooling Res	0.0009474181	1.428678	6.0	\$1,077.52	3.3
354500 2024 12	MFIE	ASHP-SEER19_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354500 2024 12	MFIE	ASHP-SEER19_ER2_MF	386.93	Cooling Res ER2	0.0009474181	0.366584	12.0	\$0.00	
354500 2024 12	MFIE	ASHP-SEER19_ER2_MF	1,080.90	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354550 2024 12	PAYS/SFIE	ASHP-SEER20_ER1_SF	2,257.71	Cooling Res	0.0009474181	2.138995	6.0	\$1,077.70	2.6
354550 2024 12	PAYS/SFIE	ASHP-SEER20_ER1_SF	2,572.52	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354550 2024 12	PAYS/SFIE	ASHP-SEER20_ER2_SF	614.66	Cooling Res ER2	0.0009474181	0.582340	12.0	\$0.00	
354550 2024 12	PAYS/SFIE	ASHP-SEER20_ER2_SF	1,707.96	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354600 2024 12	PAYS/SFIE	ASHP-SEER20_ROF_SF	667.97	Cooling Res	0.0009474181	0.632847	18.0	\$1,081.00	2.9
354600 2024 12	PAYS/SFIE	ASHP-SEER20_ROF_SF	1,928.68	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354650 2024 12	MFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	1,471.88	Cooling Res	0.0009474181	1.394486	6.0	\$3,847.73	3.1
354650 2024 12	MFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354650 2024 12	MFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF	517.47	Cooling Res ER2	0.0009474181	0.490260	12.0	\$0.00	
354650 2024 12	MFIE	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF	1,798.76	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354700 2024 12	MFIE	ASHP-SEER20_ER1_MF	1,566.84	Cooling Res	0.0009474181	1.484453	6.0	\$1,077.52	3.3
354700 2024 12	MFIE	ASHP-SEER20_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354700 2024 12	MFIE	ASHP-SEER20_ER2_MF	445.80	Cooling Res ER2	0.0009474181	0.422359	12.0	\$0.00	
354700 2024 12	MFIE	ASHP-SEER20_ER2_MF	1,080.90	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354750 2024 12	PAYS/SFIE	ASHP-SEER21_ER1_SF	2,498.89	Cooling Res	0.0009474181	2.367494	6.0	\$1,078.02	3.3
354750 2024 12	PAYS/SFIE	ASHP-SEER21_ER1_SF	3,540.79	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354750 2024 12	PAYS/SFIE	ASHP-SEER21_ER2_SF	803.95	Cooling Res ER2	0.0009474181	0.761677	12.0	\$0.00	
354750 2024 12	PAYS/SFIE	ASHP-SEER21_ER2_SF	2,421.65	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354800 2024 12	PAYS/SFIE	ASHP-SEER21_ROF_SF	820.00	Cooling Res	0.0009474181	0.776883	18.0	\$1,081.00	3.5
354800 2024 12	PAYS/SFIE	ASHP-SEER21_ROF_SF	2,434.05	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354850 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF	512.58	Cooling Res	0.0009474181	0.485628	18.0	\$3,689.00	2.8
354850 2024 12	MFIE	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354900 2024 12	MFIE	ASHP-SEER21_ER1_MF	1,620.10	Cooling Res	0.0009474181	1.534912	6.0	\$1,077.52	3.3
354900 2024 12	MFIE	ASHP-SEER21_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354900 2024 12	MFIE	ASHP-SEER21_ER2_MF	499.05	Cooling Res ER2	0.0009474181	0.472809	12.0	\$0.00	
354900 2024 12	MFIE	ASHP-SEER21_ER2_MF	1,080.90	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354950 2024 12	MFIE	ASHP-SEER17_ROF_MF	248.43	Cooling Res	0.0009474181	0.235367	18.0	\$630.00	3.3
354950 2024 12	MFIE	ASHP-SEER17_ROF_MF	1,204.98	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355000 2024 12	MFIE	ASHP-SEER18_ROF_MF	321.53	Cooling Res	0.0009474181	0.304623	18.0	\$855.00	3.3
355000 2024 12	MFIE	ASHP-SEER18_ROF_MF	1,204.98	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355050 2024 12	MFIE	ASHP-SEER19_ROF_MF	386.93	Cooling Res	0.0009474181	0.366584	18.0	\$1,081.00	3.3
355050 2024 12	MFIE	ASHP-SEER19_ROF_MF	1,204.98	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355100 2024 12	MFIE	ASHP-SEER20_ROF_MF	445.80	Cooling Res	0.0009474181	0.422359	18.0	\$1,081.00	3.3
355100 2024 12	MFIE	ASHP-SEER20_ROF_MF	1,204.98	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355150 2024 12	MFIE	ASHP-SEER21_ROF_MF	499.05	Cooling Res	0.0009474181	0.472809	18.0	\$1,081.00	3.3
355150 2024 12	MFIE	ASHP-SEER21_ROF_MF	1,204.98	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

RESIDENTIAL HVAC

Packaged Terminal Air Source Heat Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
356200_2024_12_	MFIE	PTHP-SEER12-ER1_MF	459.54	Cooling Res	0.0009474181	0.435377	5.0	\$224.93	1.01
356200_2024_12_	MFIE	PTHP-SEER12-ER1_MF	1,229.91	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356200_2024_12_	MFIE	PTHP-SEER12-ER2_MF	16.00	Cooling Res ER2	0.0009474181	0.015159	10.0	\$0.00	
356200_2024_12_	MFIE	PTHP-SEER12-ER2_MF	112.08	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356250_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF	522.59	Cooling Res	0.0009474181	0.495111	5.0	\$224.93	1.01
356250_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF	2,610.79	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356250_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF	16.00	Cooling Res ER2	0.0009474181	0.015159	10.0	\$0.00	
356250_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF	2,610.79	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356300_2024_12_	MFIE	PTHP-SEER12-ROF_MF	16.00	Cooling Res	0.0009474181	0.015159	15.0	\$84.93	1.01
356300_2024_12_	MFIE	PTHP-SEER12-ROF_MF	112.08	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356350_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF	16.00	Cooling Res	0.0009474181	0.015159	15.0	\$84.93	1.01
356350_2024_12_	MFIE	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF	2,610.79	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356400_2024_12_	MFIE	PTHP-SEER13-ER1_MF	507.53	Cooling Res	0.0009474181	0.480843	5.0	\$224.93	1.01
356400_2024_12_	MFIE	PTHP-SEER13-ER1_MF	1,248.41	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356400_2024_12_	MFIE	PTHP-SEER13-ER2_MF	63.99	Cooling Res ER2	0.0009474181	0.060625	10.0	\$0.00	
356400_2024_12_	MFIE	PTHP-SEER13-ER2_MF	130.58	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356450_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF	570.58	Cooling Res	0.0009474181	0.540578	5.0	\$224.93	1.01
356450_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF	2,629.29	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356450_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF	63.99	Cooling Res ER2	0.0009474181	0.060625	10.0	\$0.00	
356450_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF	2,629.29	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356500_2024_12_	MFIE	PTHP-SEER13-ROF_MF	63.99	Cooling Res	0.0009474181	0.060625	15.0	\$84.93	1.01
356500_2024_12_	MFIE	PTHP-SEER13-ROF_MF	130.58	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356550_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF	63.99	Cooling Res	0.0009474181	0.060625	15.0	\$84.93	1.01
356550_2024_12_	MFIE	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF	2,629.29	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356600_2024_12_	MFIE	PTHP-SEER14-ER1_MF	548.66	Cooling Res	0.0009474181	0.519810	5.0	\$224.93	1.01
356600_2024_12_	MFIE	PTHP-SEER14-ER1_MF	1,288.67	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356600_2024_12_	MFIE	PTHP-SEER14-ER2_MF	105.12	Cooling Res ER2	0.0009474181	0.099593	10.0	\$0.00	
356600_2024_12_	MFIE	PTHP-SEER14-ER2_MF	170.84	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356650_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF	611.71	Cooling Res	0.0009474181	0.579545	5.0	\$224.93	1.01
356650_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF	2,669.55	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356650_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF	105.12	Cooling Res ER2	0.0009474181	0.099593	10.0	\$0.00	
356650_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF	2,669.55	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356700_2024_12_	MFIE	PTHP-SEER14-ROF_MF	105.12	Cooling Res	0.0009474181	0.099593	15.0	\$84.93	1.01
356700_2024_12_	MFIE	PTHP-SEER14-ROF_MF	170.84	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356750_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF	105.12	Cooling Res	0.0009474181	0.099593	15.0	\$84.93	1.01
356750_2024_12_	MFIE	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF	2,669.55	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356800_2024_12_	MFIE	PTHP-SEER15-ER1_MF	584.31	Cooling Res	0.0009474181	0.553586	5.0	\$224.93	1.01
356800_2024_12_	MFIE	PTHP-SEER15-ER1_MF	1,328.35	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356800_2024_12_	MFIE	PTHP-SEER15-ER2_MF	140.77	Cooling Res ER2	0.0009474181	0.133368	10.0	\$0.00	
356800_2024_12_	MFIE	PTHP-SEER15-ER2_MF	210.52	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356850_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF	647.36	Cooling Res	0.0009474181	0.613321	5.0	\$224.93	1.01
356850_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF	2,709.23	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356850_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF	140.77	Cooling Res ER2	0.0009474181	0.133368	10.0	\$0.00	
356850_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF	2,709.23	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356900_2024_12_	MFIE	PTHP-SEER15-ROF_MF	140.77	Cooling Res	0.0009474181	0.133368	15.0	\$84.93	1.01
356900_2024_12_	MFIE	PTHP-SEER15-ROF_MF	210.52	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356950_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF	140.77	Cooling Res	0.0009474181	0.133368	15.0	\$84.93	1.01
356950_2024_12_	MFIE	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF	2,709.23	Heating Res	0.0000000000	0.000000	15.0	\$0.00	

RESIDENTIAL INCOME ELIGIBLE

AC Tune-Up

*MFIEC = Multifamily Income Eligible Comprehensive Envelope, CompE = Comprehensive Envelope									
Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
400150_2024_12	SFIE	AC Tune-up / Refrigerant charge SF	591.36	Cooling RES	0.0009474181	0.560265	2.0	\$81.00	per measure
400410_2024_12	SFIE	AC Tune-up / Packaged Service SF	368.11	Cooling RES	0.0009474181	0.348754	2.0	\$185.00	per measure
400411_2024_12	MFIE	AC Tune-up / Packaged Service MF	239.27	Cooling RES	0.0009474181	0.226689	2.0	\$185.00	per measure

Air Sealing

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units (sq. ft)
400450_2024_12	MFIE	Air Sealing (infiltration reduction) - 30% MF IE DI electric furnace base	0.330	Building Shell RES	0.0004660805	0.29	0.04	0.000154	20.0	\$0.12	1.0
400500_2024_12	MFIE	Air Sealing (infiltration reduction) - 30% MF IE DI heat pump base	0.250	Building Shell RES	0.0004660805	0.21	0.04	0.000117	20.0	\$0.12	1.0
400501_2022_12	MFIE	Air Sealing (infiltration reduction) - 30% MF IE DI gas furnace base	0.050	Building Shell RES	0.0004660805	0.01	0.04	0.000023	20.0	\$0.12	1.0
400550_2024_12	PAYS/SFIE	Air Sealing (infiltration reduction) - 30% SF IE DI electric furnace base	0.360	Building Shell RES	0.0004660805	0.308	0.05	0.000168	20.0	\$0.12	1.0
400551_2024_12	PAYS/SFIE	Air Sealing (infiltration reduction) - 30% SF IE DI gas furnace base	0.060	Building Shell RES	0.0004660805	0.012	0.050	0.000028	20.0	\$0.12	1.0
400600_2024_12	PAYS/SFIE	Air Sealing (infiltration reduction) - 30% SF IE DI heat pump base	0.310	Building Shell RES	0.0004660805	0.26	0.05	0.000144	20.0	\$0.12	1.0
400650_2024_12	SFIE	MH Adjusted Air Sealing (infiltration reduction) - 30% SF IE DI electric furnace base	0.480	Building Shell RES	0.0004660805	0.41	0.06	0.000224	20.0	\$0.12	1.0
400651_2024_12	SFIE	MH Adjusted Air Sealing (infiltration reduction) - 30% SF IE DI heat pump base	0.450	Building Shell RES	0.0004660805	0.39	0.06	0.000210	20.0	\$0.12	1.0
400652_2024_12	SFIE	MH Adjusted Air Sealing (infiltration reduction) - 30% SF IE DI gas furnace base	0.080	Building Shell RES	0.0004660805	0.02	0.06	0.000037	20.0	\$0.12	1.0

Ceiling Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units - area of ceiling/attic
400700_2024_12	MFIE	Ceiling Insulation R11-R49 MF IE DI electric furnace base	0.91	Building Shell RES	0.0004660805	0.8	0.10	0.000424	30.0	\$2.12	1.0
400750_2024_12	MFIE	Ceiling Insulation R11-R49 MF IE DI heat pump base	0.61	Building Shell RES	0.0004660805	0.5	0.11	0.000284	30.0	\$2.12	1.0
400800_2024_12	MFIE	Ceiling Insulation R11-R49 MF IE DI gas heat electric cool base	0.14	Building Shell RES	0.0004660805	0.0	0.10	0.000065	30.0	\$2.12	1.0
400850_2024_12	PAYS	Ceiling Insulation R11-R49 SF IE DI electric furnace base	0.91	Building Shell RES	0.0004660805	0.8	0.10	0.000424	30.0	\$2.12	1.0
400900_2024_12	PAYS	Ceiling Insulation R11-R49 SF IE DI heat pump base	0.61	Building Shell RES	0.0004660805	0.5	0.11	0.000284	30.0	\$2.12	1.0
400950_2024_12	PAYS	Ceiling Insulation R11-R49 SF IE DI gas heat electric cool base	0.14	Building Shell RES	0.0004660805	0.0	0.10	0.000065	30.0	\$2.12	1.0
401000_2024_12	MFIE	Ceiling Insulation R5-R30 MF IE DI electric furnace base	1.49	Building Shell RES	0.0004660805	1.3	0.16	0.000694	30.0	\$1.16	1.0
401050_2024_12	MFIE	Ceiling Insulation R5-R30 MF IE DI heat pump base	1.00	Building Shell RES	0.0004660805	0.8	0.18	0.000466	30.0	\$1.16	1.0
401100_2024_12	MFIE	Ceiling Insulation R5-R30 MF IE DI gas heat electric cool base	0.22	Building Shell RES	0.0004660805	0.1	0.16	0.000103	30.0	\$1.16	1.0
401150_2024_12	PAYS	Ceiling Insulation R5-R30 SF IE DI electric furnace base	1.49	Building Shell RES	0.0004660805	1.3	0.16	0.000694	30.0	\$1.16	1.0
401200_2024_12	PAYS	Ceiling Insulation R5-R30 SF IE DI heat pump base	1.00	Building Shell RES	0.0004660805	0.8	0.18	0.000466	30.0	\$1.16	1.0
401250_2024_12	PAYS	Ceiling Insulation R5-R30 SF IE DI gas heat electric cool base	0.22	Building Shell RES	0.0004660805	0.1	0.16	0.000103	30.0	\$1.16	1.0
401300_2024_12	MFIE	Ceiling Insulation R5-R38 MF IE DI electric furnace base	1.60	Building Shell RES	0.0004660805	1.4	0.18	0.000746	30.0	\$1.68	1.0
401350_2024_12	MFIE	Ceiling Insulation R5-R38 MF IE DI heat pump base	1.07	Building Shell RES	0.0004660805	0.9	0.19	0.000499	30.0	\$1.68	1.0
401400_2024_12	MFIE	Ceiling Insulation R5-R38 MF IE DI gas heat electric cool base	0.24	Building Shell RES	0.0004660805	0.1	0.18	0.000112	30.0	\$1.68	1.0
401450_2024_12	PAYS	Ceiling Insulation R5-R38 SF IE DI electric furnace base	1.60	Building Shell RES	0.0004660805	1.4	0.18	0.000746	30.0	\$1.68	1.0
401500_2024_12	PAYS	Ceiling Insulation R5-R38 SF IE DI heat pump base	1.07	Building Shell RES	0.0004660805	0.9	0.19	0.000499	30.0	\$1.68	1.0
401550_2024_12	PAYS	Ceiling Insulation R5-R38 SF IE DI gas heat electric cool base	0.24	Building Shell RES	0.0004660805	0.1	0.18	0.000112	30.0	\$1.68	1.0
401600_2024_12	MFIE	Ceiling Insulation R5-R49 MF IE DI electric furnace base	1.69	Building Shell RES	0.0004660805	1.5	0.19	0.000788	30.0	\$2.57	1.0
401650_2024_12	MFIE	Ceiling Insulation R5-R49 MF IE DI heat pump base	1.14	Building Shell RES	0.0004660805	0.9	0.21	0.000531	30.0	\$2.57	1.0
401700_2024_12	MFIE	Ceiling Insulation R5-R49 MF IE DI gas heat electric cool base	0.25	Building Shell RES	0.0004660805	0.1	0.19	0.000117	30.0	\$2.57	1.0
401750_2024_12	PAYS	Ceiling Insulation R5-R49 SF IE DI electric furnace base	1.69	Building Shell RES	0.0004660805	1.5	0.19	0.000788	30.0	\$2.57	1.0
401800_2024_12	PAYS	Ceiling Insulation R5-R49 SF IE DI heat pump base	1.14	Building Shell RES	0.0004660805	0.9	0.21	0.000531	30.0	\$2.57	1.0
401850_2024_12	PAYS	Ceiling Insulation R5-R49 SF IE DI gas heat electric cool base	0.25	Building Shell RES	0.0004660805	0.1	0.19	0.000117	30.0	\$2.57	1.0
401900_2024_12	MFIE	Ceiling Insulation R5-R60 MF IE DI electric furnace base	1.76	Building Shell RES	0.0004660805	1.6	0.20	0.000820	30.0	\$3.42	1.0
401950_2024_12	MFIE	Ceiling Insulation R5-R60 MF IE DI heat pump base	1.18	Building Shell RES	0.0004660805	1.0	0.21	0.000550	30.0	\$3.42	1.0
402000_2024_12	MFIE	Ceiling Insulation R5-R60 MF IE DI gas heat electric cool base	0.26	Building Shell RES	0.0004660805	0.1	0.20	0.000121	30.0	\$3.42	1.0
402050_2024_12	PAYS	Ceiling Insulation R5-R60 SF IE DI electric furnace base	1.76	Building Shell RES	0.0004660805	1.6	0.20	0.000820	30.0	\$3.42	1.0
402100_2024_12	PAYS	Ceiling Insulation R5-R60 SF IE DI heat pump base	1.18	Building Shell RES	0.0004660805	1.0	0.21	0.000550	30.0	\$3.42	1.0
402150_2024_12	PAYS	Ceiling Insulation R5-R60 SF IE DI gas heat electric cool base	0.26	Building Shell RES	0.0004660805	0.1	0.20	0.000121	30.0	\$3.42	1.0

Floor Insulation

*MH = Mobile Home											
Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units - area of floor (ft2)
402200_2024_12	SFIE	Floor Insulation R25 (R-3.96 base) MH electric furnace/baseboard and electric cooling	2.05	Building Shell RES	0.0004660805	1.81	0.24	0.000955	30.0	\$0.68	1.0
402201_2024_12	SFIE	Floor Insulation R25 (R-3.96 base) MH heat pump and electric cooling	1.36	Building Shell RES	0.0004660805	1.12	0.24	0.000634	30.0	\$0.68	1.0
402202_2024_12	SFIE	Floor Insulation R25 (R-3.96 base) MH gas furnace/baseboard and electric cooling	0.24	Building Shell RES	0.0004660805	0.00	0.24	0.000112	30.0	\$0.68	1.0
402203_2024_12	SFIE	Floor Insulation R25 (R-13 base) MH electric furnace/baseboard and electric cooling	0.20	Building Shell RES	0.0004660805	0.18	0.02	0.000093	30.0	\$0.68	1.0
402204_2024_12	SFIE	Floor Insulation R25 (R-13 base) MH heat pump and electric cooling	0.11	Building Shell RES	0.0004660805	0.09	0.02	0.000051	30.0	\$0.68	1.0
402205_2024_12	SFIE	Floor Insulation R25 (R-13 base) MH gas furnace/baseboard and electric cooling	0.02	Building Shell RES	0.0004660805	0.00	0.02	0.000009	30.0	\$0.68	1.0

Dirty Filter Alarm

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units
402250_2024_12	MFIE/SFIE	Dirty Filter Alarm, MFIE	68.45	HVAC RES	0.0004660805	43.3	25.2	0.031903	5.0	\$5.00	per measure

Duct Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	ΔkWhCooling	ΔkWhHeating	Δtherms	kW	EUL	Inc. Cost*	Units - DuctLength (ft.)
402300_2024_12	PAYS	Duct Insulation - Electric Heating	22.80	HVAC RES	0.0004660805	1.3	21.5	0.00	0.010627	20.0	\$4.22	1.0
402350_2024_12	PAYS	Mobile Home Adjusted Duct Insulation - Electric Heating	22.80	HVAC RES	0.0004660805	1.3	21.5	0.00	0.010627	20.0	\$4.22	1.0
402400_2024_12	PAYS	Duct Insulation - Gas Heating	2.49	HVAC RES	0.0004660805	1.3	1.2	1.32	0.001161	20.0	\$4.22	1.0

RESIDENTIAL INCOME ELIGIBLE

Duct Repair (Duct Sealing and Repair - Methodology 3)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	ΔkWhCooling	ΔkWhHeating	kW	EUL	Inc. Cost*	Units - DuctLength (ft.)
402450_2024_12	SFIE	Duct Repair (Sealing) - Electric Heating SF	4.92	HVAC RES	0.0004660805	0.8	4.1	0.002293	20.0	\$8.04	1.0
402451_2024_12	SFIE	Duct Repair (Sealing) - Gas Heating SF	1.00	HVAC RES	0.0004660805	0.8	0.2	0.000466	20.0	\$8.04	1.0
402452_2024_12	MFIE	Duct Repair (Sealing) - Electric Heating MF Adjusted	4.11	HVAC RES	0.0004660805	0.70	3.41	0.001916	20.0	\$8.04	1.0
402453_2024_12	MFIE	Duct Repair (Sealing) - Gas Heating MF Adjusted	0.87	HVAC RES	0.0004660805	0.70	0.17	0.000405	20.0	\$8.04	1.0
402500_2024_12	SFIE	Duct Repair (Sealing) - Electric Heating MH Adjusted	6.01	HVAC RES	0.0004660805	1.0	5.1	0.002801	20.0	\$8.04	1.0
402501_2024_12	SFIE	Duct Repair (Sealing) - Gas Heating MH Adjusted	1.19	HVAC RES	0.0004660805	1.0	0.2	0.000555	20.0	\$8.04	1.0

ECM/ Blower Motor

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	Auto kWh	Continuous kWh	kW	EUL	Inc. Cost	Units
402600_2024_12	SFIE	ECM Auto Fan Early Replacement ER1 (Full Cost) - SF	579.09	HVAC RES	0.0004660805	264.1	28.2	286.7	0.0	0.269903	6	\$262.50	per measure
402600_2024_12	SFIE	ECM Auto Fan Early Replacement ER2 (Remaining Life) - SF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000	0	\$0.00	per measure
402800_2024_12	MFIE	ECM Auto Fan Early Replacement ER1 (Full Cost) - MF	579.09	HVAC RES	0.0004660805	264.1	28.2	286.7	0.0	0.269903	6	\$262.50	per measure
402800_2024_12	MFIE	ECM Auto Fan Early Replacement ER2 (Remaining Life) - MF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000	0	\$0.00	per measure

Note: As part of the Code of Federal Regulations, energy conservation standards for covered residential furnace fans became effective on July 3, 2019 (10 CFR 430.32(l)). This code requirement effectively makes ECMs part of the baseline for New Construction (NC), Replace-on-Fail (ROF), Time-of-Replacement (TOS), and Early Replacement (EREP) scenarios. Savings are only allowable for EREP measures, for the remaining useful life of the existing equipment (ER1, 6 years). Therefore, the EUL of the measure is assumed to be 6 years. (ER1 = 6, ER2 = 0).

Heat Pump (HP) Tune-up

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
403311_2021_12	MFIE	HP tune-up / Packaged Service MF	226.60	Cooling RES	0.0009474181	0.214685	2.0	\$185.00	per measure
403311_2021_12	MFIE	HP tune-up / Packaged Service MF	726.80	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure

Low Flow Faucet Aerators (Bathroom)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
403400_2024_12	MFIE	Low Flow Bathroom Faucet Aerator MFIE DI	40.62	Water heating RES	0.0000887318	0.054	0.003604	10.0	\$11.33	per measure
403450_2024_12	PAYS/SFIE	Low Flow Bathroom Faucet Aerator SFIE DI	40.62	Water heating RES	0.0000887318	0.054	0.003604	10.0	\$11.33	per measure

Low Flow Faucet Aerators (Kitchen)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
403480_2024_12	MFIE	Low Flow Kitchen Faucet Aerator MFIE DI	121.19	Water Heating RES	0.0000887318	0.086	0.010753	10.0	\$11.33	per measure
403481_2024_12	PAYS/SFIE	Low Flow Kitchen Faucet Aerator SFIE DI	121.19	Water Heating RES	0.0000887318	0.086	0.010753	10.0	\$11.33	per measure

Low Flow Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
403550_2024_12	MFIE	Low Flow Showerhead MFIE DI	248.01	Water heating RES	0.0000887318	0.116	0.022006	10.0	\$15.33	per measure
403551_2024_12	MFIE	Low Flow Handheld Showerhead MFIE DI	248.01	Water heating RES	0.0000887318	0.116	0.022006	10.0	\$23.35	per measure
403600_2024_12	PAYS/SFIE	Low Flow Showerhead SFIE DI	207.70	Water heating RES	0.0000887318	0.116	0.018430	10.0	\$15.33	per measure
403601_2024_12	SFIE	Low Flow Handheld Showerhead SFIE DI	207.70	Water heating RES	0.0000887318	0.116	0.018430	10.0	\$23.35	per measure

Pipe Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
403700_2019_12	MFIE	Pipe Insulation MFIE DI	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$5.66	per foot
403750_2019_12	PAYS/SFIE	Pipe Insulation SFIE DI	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$5.66	per foot

Programmable Thermostat

*MFLIC = Multifamily Low Income Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
403800_2019_12	MFIE	Setback thermostat - full setback - ASHP heating/cooling MF	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
403800_2019_12	MFIE	Setback thermostat - full setback - ASHP heating/cooling MF	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403850_2024_12	SFIE	Setback thermostat - full setback - ASHP heating/cooling SF	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
403850_2024_12	SFIE	Setback thermostat - full setback - ASHP heating/cooling SF	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403900_2019_12	MFIE	Setback thermostat - full setback - elec furnace heating / central AC MF	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
403900_2019_12	MFIE	Setback thermostat - full setback - elec furnace heating / central AC MF	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403950_2024_12	SFIE	Setback thermostat - full setback - elec furnace heating / central AC SF	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
403950_2024_12	SFIE	Setback thermostat - full setback - elec furnace heating / central AC SF	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404000_2024_12	MFIE	Setback thermostat - full setback - gas heating / central AC MF	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
404000_2024_12	MFIE	Setback thermostat - full setback - gas heating / central AC MF	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404050_2019_12	SFIE	Setback thermostat for SF - full setback - gas heating / central AC	0.00	Cooling RES	0.0009474181	0.000000	10.0	\$70.00	per measure
404050_2019_12	SFIE	Setback thermostat for SF - full setback - gas heating / central AC	0.00	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure

RESIDENTIAL INCOME ELIGIBLE

Lighting															
** CFL baseline is Post 2021, EISA baseline is pre-2021 **															
Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use - RES	kW Factor - RES	End Use - BUS	kW Factor - BUS	kWh RES	kWh BUS	kW	EUL - RES	EUL - BUS**	Inc. Cost*		Units
													\$F	MF	
404450_2024_12	PAYS/SFIE / MFIE	LED - 10.5W Downlight E26 IE DI	44.6	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	44.6	0.00000000	0.006651	8.0	0.0	\$1.66	\$1.66	per measure
404500_2024_12	PAYS/SFIE / MFIE	LED - 10W (750-899 lumens) IEDI	22.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	22.22	0.00000000	0.003316	8.0	0.0	\$1.45	\$1.45	per measure
404600_2024_12	PAYS/SFIE / MFIE	LED - 12W Dimmable Light Bulb IE DI	58.3	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	58.3	0.00000000	0.008705	8.0	0.0	\$1.66	\$1.66	per measure
404650_2024_12	PAYS/SFIE / MFIE	LED - 15W (900-1399 lumens) IEDI	27.8	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.8	0.00000000	0.004147	8.0	0.0	\$1.45	\$1.45	per measure
404651_2024_12	PAYS/SFIE / MFIE	LED - 11W Flood Light BR30 Bulb IE DI	41.9	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	41.9	0.00000000	0.006260	8.0	0.0	\$1.66	\$1.66	per measure
404700_2024_12	PAYS/SFIE / MFIE	LED - 15W Flood Light PAR30 Bulb IE DI	69.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	69.5	0.00000000	0.010368	8.0	0.0	\$1.66	\$1.66	per measure
404750_2024_12	PAYS/SFIE / MFIE	LED - 18W Flood Light PAR38 Bulb IE DI	87.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	87.2	0.00000000	0.013009	8.0	0.0	\$1.66	\$1.66	per measure
404800_2024_12	PAYS/SFIE / MFIE	LED - 20W (1400-1999 lumens) IEDI	37.4	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	37.4	0.00000000	0.005575	8.0	0.0	\$1.45	\$1.45	per measure
404850_2024_12	PAYS/SFIE / MFIE	LED - 4W Candelabra Specialty IE DI	23.3	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.26	0.00000000	0.003472	8.0	0.0	\$1.66	\$1.66	per measure
404950_2024_12	PAYS/SFIE / MFIE	LED - 8W Globe Light G25 Bulb Specialty IE DI	61.0	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	60.9	0.00000000	0.009097	8.0	0.0	\$1.66	\$1.66	per measure
405410_2024_12	PAYS/SFIE / MFIE	LED - 6W (400-749 lumens) IEDI	15.1	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	15.1	0.00000000	0.002250	8.0	0.0	\$1.45	\$1.45	per measure
405430_2024_12	SFIE	LED Nightlights	28.53	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	28.5	0.00000000	0.004258	8.0	0.0	\$3.35	\$3.35	per measure

Advanced Power Strips Tier 2

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
405750_2024_12	MFIE	Advanced Tier 2 Power Strips: Infrared ,TOS/NC	177.080	Miscellaneous RES	0.0001148238	0.020333	10.0	\$60.00	per measure
405751_2024_12	SFIE	Advanced Tier 2 Power Strips: Infrared DI	177.080	Miscellaneous RES	0.0001148238	0.020333	10.0	\$60.00	per measure

Refrigerator

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
405800_2024_12	SFIE / MFIE	Refrigerator - early replacement ER1	643.50	Refrigeration RES	0.0001285253	0.082706	5.0	\$28.00	per measure
405800_2024_12	SFIE / MFIE	Refrigerator - early replacement ER2	41.53	Refrigeration RES ER2	0.0001285253	0.005338	10.0	\$0.00	per measure
405825_2024_12	SFIE / MFIE	Refrigerator - Pre 1993 - ER1	1298.55	Refrigeration RES	0.0001285253	0.166896	5.0	\$28.00	per measure
405825_2024_12	SFIE / MFIE	Refrigerator - Pre 1993 - ER2	41.53	Refrigeration RES ER2	0.0001285253	0.005338	10.0	\$0.00	per measure

Energy Star Room AC

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
406000_2024_12	SFIE	AC - Energy Star Room _unknown size_ SF	400.38	Cooling RES	0.0009474181	0.379327	12.0	\$300.00	per measure
406004_2024_12	SFIE	AC - Energy Star Room _12kBtu_ SF	465.46	Cooling RES	0.0009474181	0.440985	12.0	\$300.00	per measure

Cool Roofs

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
406804_2024_12	MFIE	Cool Roof: Multi-Family Vintage Up to 1979-Non-Electric Heating	114.00	Building Shell RES	0.0004660805	0.053133	15.0	\$7.84	per sq ft
406805_2024_12	MFIE	Cool Roof: Multi-Family Vintage 1980-1999-Non-Electric Heating	58.10	Building Shell RES	0.0004660805	0.027079	15.0	\$7.84	per sq ft
406806_2024_12	MFIE	Cool Roof: Multi-Family Vintage 2000-2009-Non-Electric Heating	24.90	Building Shell RES	0.0004660805	0.011605	15.0	\$7.84	per sq ft
406807_2024_12	MFIE	Cool Roof: Multi-Family Vintage 2010-2015-Non-Electric Heating	19.50	Building Shell RES	0.0004660805	0.009089	15.0	\$7.84	per sq ft
406812_2024_12	MFIE	Cool Roof: Multi-Family Vintage Up to 1979-Heat Pump Heating	47.88	Building Shell RES	0.0004660805	0.022316	15.0	\$7.84	per sq ft
406813_2024_12	MFIE	Cool Roof: Multi-Family Vintage 1980-1999-Heat Pump Heating	24.40	Building Shell RES	0.0004660805	0.011372	15.0	\$7.84	per sq ft
406814_2024_12	MFIE	Cool Roof: Multi-Family Vintage 2000-2009-Heat Pump Heating	10.46	Building Shell RES	0.0004660805	0.004875	15.0	\$7.84	per sq ft
406815_2024_12	MFIE	Cool Roof: Multi-Family Vintage 2010-2015-Heat Pump Heating	8.19	Building Shell RES	0.0004660805	0.003817	15.0	\$7.84	per sq ft

RESIDENTIAL DEMAND RESPONSE

←----- Use the "Grouping" Features to expand or hide the formulas/input variables

Demand Response Advanced Thermostat

Measure Reference No.	Program/Channel	Measure [1]	Gross kWh Annual Savings [2]	End Use [3]	kW Factor [4]	Summer kW (Annual) [5]	Winter kW (Annual) [6]	EUL	Inc. Cost	Units
600050_2024_12_	DR	Summer Demand Response Advanced Thermostat - with Program-driven Optimization	0.00	-	n/a	-	-	1.0	\$0.00	per thermostat
600060_2023_12_	DR	Winter Demand Response Advanced Thermostat - with Program-driven Optimization	0.00	-	n/a	-	-	1.0	\$0.00	per thermostat
600100_2021_12_	DR	Summer Demand Response Advanced Thermostat - without Program-Driven Optimization	0.00	-	n/a	-	-	1.0	\$0.00	per thermostat
600110_2023_12_	DR	Winter Demand Response Advanced Thermostat - without Program-Driven Optimization	0.00	-	n/a	-	-	1.0	\$0.00	per thermostat

TRM Section:

3.7.2

[Note 1]

As advanced thermostats mature, some models include embedded optimization routines that achieve energy savings. The program differentiates between thermostats with "program-driven optimization," which achieve savings through program influence to operate optional optimization, and without "program-driven optimization," which achieve no energy savings due to either the default optimization baseline or no optimization routine employed.

[Note 2]

Source for Savings: Ameren MO PY2023 Final Report

Device Optimization Energy Savings Summary, Aggregate: Table 19.

Total Number of Devices Enrolled at the end of the 2023 event season: Ameren Missouri Demand Response PY2023 Program Tracking Data

Gross kWh Annual Savings are calculated as the total aggregate PY2023 energy savings (502.57 MWh) divided by the number of devices active at the end of the 2023 event season (8,140).

[Note 3]

End Use should be "Cooling RES" for optimization routines that save energy only during the cooling season, and "Heating RES" for optimization routines that save energy only during the heating season. For optimization routines that save energy during both cooling and heating seasons and energy savings are aggregated, the End Use may be "HVAC RES."

[Note 4]

The kW factor based on end use is not used because the actual demand impacts are directly measured.

Summer demand savings are calculated for demand response events, therefore no demand savings are calculated based on the energy savings for this measure. For planning estimates a value of 0.95 kW/thermostat is assumed based on the PY23 evaluation results; refer to Table 17. Residential DR Program: Event Day Energy Savings by Device Manufacturer for the number of devices and Table 13. Residential DR Program: Resource Capability Impacts for the per account kW impacts and number of accounts.

[Note 5]

Per device kW impact is calculated as the per account kW load impact (1.13) multiplied by the number of accounts (46,213) all divided by the number of devices (54,808).

[Note 6]

Winter demand savings are calculated for demand response events. For planning estimates a value of 1.3 kW/thermostat. Calculated by examining the average hourly kW reduction during a summer event, adjusting for winter conditions by reducing the estimate by 30%, and applying an adjustment factor of 0.78. (Source: ADM Associates, Inc., "py2024_residential_dr_winter_savings_estimation_07.12.2024.xlsx").

Residential demand response: For demand and energy savings associated with calling a demand response event, smart thermostat program participants will be randomly partitioned into two groups. In this scenario, on an event day, participants in one group receive a signal to initiate activity on the thermostat, while the other group of participants would not receive this signal. As a result, the participants who receive the signal will serve as the treatment group, and the participants who do not receive a signal will serve as the control group. Demand impacts will be estimated from the average of the hours over all event periods. Energy savings impacts will be estimated from comparing the 24 hours of the control group for each event day to the 24 hours of actual kWh consumption for each event day. However, if it is not practical or plausible to use this approach (such as everyone is dispatched), other quasi experimental design approaches may be used.

Business demand response: For demand and energy savings associated with calling a demand response event, a customer baseline load ("CBL") approach will be used. A CBL approach applies a model or algorithm to develop customer-specific baselines for each event that are used to estimate load impacts for each hour of the event. Demand impacts will be estimated from the average of the hours over all event periods. Energy savings impacts will be estimated from comparing the 24 hours of the CBL for each event day to the 24 hours of actual kWh consumption for each event day.

Demand Response Water Heater

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor [1]	Summer kW (Annual) [2]	Winter kW (Annual) [3]	EUL	Inc. Cost	Units
600401_2024_12_	DR	Demand Response Heat Pump Water Heater Switch	0.00	-	n/a	0.2700	-	1.0	\$149.00	per unit
600402_2024_12_	DR	Demand Response Electric Resistance Water Heater Switch	0.00	-	n/a	0.2200	-	1.0	\$149.00	per unit

TRM Section:

3.9.3

[Note 1]

The kW factor based on end use is not used because the actual demand impacts are directly measured.

Summer demand savings are calculated for demand response events, therefore no demand savings are calculated based on the energy savings for this measure. These values have not been reviewed through evaluation. The demand reduction impact planning values of 0.27 kW for Heat Pump Water Heaters and 0.22 kW for Electric Water Heaters were calculated based on the percent reduction by demand response (DR) applied to the coincident peak load. Specifically:

[Note 2]

Heat Pump Water Heater: The 52% reduction applied to the coincident peak load of 0.52 kW results in a demand reduction impact of 0.27 kW.

Electric Water Heater: The 42% reduction applied to the coincident peak load of 0.52 kW results in a demand reduction impact of 0.22 kW.

These calculations utilize the EPRI end-use loadshape database to determine the coincident peak load, as specific loadshape or peak load data for Missouri was unavailable. Therefore, the coincident peak values were derived from the SERC region data.

[Note 3]

Winter demand savings are calculated for demand response events.

Table below calculates a weighted average kWh and Kw value for HVAC Early Replacement (ER) vs Replace on Fail (ROF) measures based on the TRM values and the ER % Entered below (cell "BC3").														
		ER ROF												
		60% 40%												
		Weighted Average				Weighted Average				Weighted Average Total				
MEASURE NAME		ID	ER1 Cooling kWh	ER1 Heating kWh	ER2 Cooling kWh	ER2 Heating kWh	ER1 Cooling kW	ER1 Heating kW	ER2 Cooling kW	ER2 Heating kW	ER1 Total kWh	ER2 Total kWh	ER1 Total kW	ER2 Total kW
CAC-SEER15_ER1_SF		350600	1,369.95		269.15		1.297915	-	0.254998	-	1,369.95	269.15	1.297915	0.254998
CAC-SEER15_ROF_SF		350650	1,369.95		269.15		1.297915	-	0.254998	-	1,369.95	269.15	1.297915	0.254998
CAC-SEER16_ER1_SF		350800	1,455.93		365.39		1.379374	-	0.346177	-	1,455.93	365.39	1.379374	0.346177
CAC-SEER16_ROF_SF		350850	1,455.93		365.39		1.379374	-	0.346177	-	1,455.93	365.39	1.379374	0.346177
CAC-SEER16_ER1_MF		350900												
CAC-SEER17_ER1_SF		351000	1,648.96		538.02		1.562255	-	0.509730	-	1,648.96	538.02	1.562255	0.509730
CAC-SEER17_ROF_SF		351050	1,648.96		538.02		1.562255	-	0.509730	-	1,648.96	538.02	1.562255	0.509730
CAC-SEER18_ER1_SF		351160	1,775.01		661.55		1.681677	-	0.626764	-	1,775.01	661.55	1.681677	0.626764
CAC-SEER18_ROF_SF		351161	1,775.01		661.55		1.681677	-	0.626764	-	1,775.01	661.55	1.681677	0.626764
CAC-SEER19_ER1_SF		351170	2,496.22		1,016.19		2.364964	-	0.962757	-	2,496.22	1,016.19	2.364964	0.962757
CAC-SEER19_ROF_SF		351171	2,496.22		1,016.19		2.364964	-	0.962757	-	2,496.22	1,016.19	2.364964	0.962757
CAC-SEER20_ER1_SF		351180	2,084.33		948.68		1.974732	-	0.898797	-	2,084.33	948.68	1.974732	0.898797
CAC-SEER20_ROF_SF		351181	2,084.33		948.68		1.974732	-	0.898797	-	2,084.33	948.68	1.974732	0.898797
CAC-SEER21+_ER1_SF		351190	2,061.51		1,033.35		1.953112	-	0.979014	-	2,061.51	1,033.35	1.953112	0.979014
CAC-SEER21+_ROF_SF		351191	2,061.51		1,033.35		1.953112	-	0.979014	-	2,061.51	1,033.35	1.953112	0.979014
Mini/MultiSplitAC_ER1_SF		351200	832.46		289.79		0.788688	-	0.274552	-	832.46	289.79	0.788688	0.274552
Mini/MultiSplitAC_ROF_SF		351250	832.46		289.79		0.788688	-	0.274552	-	832.46	289.79	0.788688	0.274552
Mini/MultiSplitASHP_ROF_SF_NC		351300	795.42	1,240.51	583.36	980.18	0.753595	-	0.552686	-	2,035.93	1,563.54	0.753595	0.552686
Mini/MultiSplitASHP_ROF_SF		351350	795.42	1,240.51	583.36	980.18	0.753595	-	0.552686	-	2,035.93	1,563.54	0.753595	0.552686
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF		351400	814.43	4,501.71	377.69	4,501.71	0.771606	-	0.357830	-	5,316.14	4,879.40	0.771606	0.357830
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF		351401	814.43	-	377.69	-	0.771606	-	0.357830	-	814.43	377.69	0.771606	0.357830
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF		351450	814.43	4,501.71	377.69	4,501.71	0.771606	-	0.357830	-	5,316.14	4,879.40	0.771606	0.357830
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF		351451	814.43	-	377.69	-	0.771606	-	0.357830	-	814.43	377.69	0.771606	0.357830
Mini/MultiSplitASHP_ER1_SF		351500	795.42	1,240.51	583.36	980.18	0.753595	-	0.552686	-	2,035.93	1,563.54	0.753595	0.552686
Mini/MultiSplitAC_ER1_MF		351550												
DFHP-SEER19-ROF_MF		351900	398.66	545.76	-	-	0.377698	-	-	-	944.42	-	0.377698	-
DFHP-SEER20-ROF_MF		351950	594.40	876.06	-	-	0.563145	-	-	-	1,470.46	-	0.563145	-
DFHP-SEER21-ROF_MF		352000	816.63	1,268.10	-	-	0.773690	-	-	-	2,084.73	-	0.773690	-
GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF		352050	3,478.20	15,960.03	1,577.17	15,960.03	3.295310	-	1.494239	-	19,438.23	17,537.20	3.295310	1.494239
GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF		352100	3,478.20	15,960.03	1,577.17	15,960.03	3.295310	-	1.494239	-	19,438.23	17,537.20	3.295310	1.494239
GSHP-EER23-Replace_ASHP_ER1_SF		352200	3,196.06	4,726.40	1,385.22	4,726.40	3.028005	-	1.312383	-	7,922.46	6,111.62	3.028005	1.312383
GSHP-EER23_ROF_SF		352250	3,196.06	4,726.40	1,385.22	4,726.40	3.028005	-	1.312383	-	7,922.46	6,111.62	3.028005	1.312383
GSHP-EER23-Replace_GSHP_ER1_SF		352260	3,196.06	4,726.40	1,385.22	4,726.40	3.028005	-	1.312383	-	7,922.46	6,111.62	3.028005	1.312383
ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF		352300	1,312.07	8,563.13	269.26	8,563.13	1.243079	-	0.255102	-	9,875.20	8,832.39	1.243079	0.255102
ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF		352310	1,312.07	-	269.26	-	1.243079	-	0.255102	-	1,312.07	269.26	1.243079	0.255102
ASHP-SEER15_ER1_SF		352350												
ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF		352400	1,312.07	8,563.13	269.26	8,563.13	1.243079	-	0.255102	-	9,875.20	8,832.39	1.243079	0.255102
ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF		352410	1,312.07	-	269.26	-	1.243079	-	0.255102	-	1,312.07	269.26	1.243079	0.255102
ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF		352500	1,447.94	8,676.99	390.30	8,676.99	1.371805	-	0.369777	-	10,124.93	9,067.29	1.371805	0.369777
ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF		352510	1,447.94	-	390.30	-	1.371805	-	0.369777	-	1,447.94	390.30	1.371805	0.369777
ASHP-SEER16_ER1_SF		352550	1,387.72	1,597.98	241.47	1,089.75	1.314751	-	0.228773	-	2,985.70	1,331.22	1.314751	0.228773
ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF		352600	1,447.94	8,676.99	390.30	8,676.99	1.371805	-	0.369777	-	10,124.93	9,067.29	1.371805	0.369777
ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF		352610	1,447.94	-	390.30	-	1.371805	-	0.369777	-	1,447.94	390.30	1.371805	0.369777
ASHP-SEER16_ROF_SF		352650	1,387.72	1,597.98	241.47	1,089.75	1.314751	-	0.228773	-	2,985.70	1,331.22	1.314751	0.228773
ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF		353000												
ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF		353100	1,539.94	9,694.92	510.85	9,694.92	1.458967	-	0.483989	-	11,234.86	10,205.77	1.458967	0.483989
ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF		353110	1,539.94	-	510.85	-	1.458967	-	0.483989	-	1,539.94	510.85	1.458967	0.483989
ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF		353200	1,835.95	10,174.02	680.07	10,174.02	1.739412	-	0.644311	-	12,009.97	10,854.09	1.739412	0.644311
ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF		353210	1,835.95	-	680.07	-	1.739412	-	0.644311	-	1,835.95	680.07	1.739412	0.644311
ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF		353300	1,873.15	12,063.70	840.97	12,063.70	1.774656	-	0.796750	-	13,936.85	12,904.67	1.774656	0.796750

Table below calculates a weighted average kWh and Kw value for HVAC Early Replacement (ER) vs Replace on Fail (ROF) measures based on the TRM values and the ER % Entered below (cell "BC3").													
		ER ROF		60% 40%									
		Weighted Average				Weighted Average				Weighted Average Total			
MEASURE NAME	ID	ER1 Cooling kWh	ER1 Heating kWh	ER2 Cooling kWh	ER2 Heating kWh	ER1 Cooling kW	ER1 Heating kW	ER2 Cooling kW	ER2 Heating kW	ER1 Total kWh	ER2 Total kWh	ER1 Total kW	ER2 Total kW
ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	353310	1,873.15	-	840.97	-	1.774656	-	0.796750	-	1,873.15	840.97	1.774656	0.796750
ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	353400	1,684.09	9,561.65	784.64	9,561.65	1.595537	-	0.743382	-	11,245.74	10,346.29	1.595537	0.743382
ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	353410	1,684.09	-	784.64	-	1.595537	-	0.743382	-	1,684.09	784.64	1.595537	0.743382
ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	353450	1,684.09	9,561.65	784.64	9,561.65	1.595537	-	0.743382	-	11,245.74	10,346.29	1.595537	0.743382
ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	353460	1,684.09	-	784.64	-	1.595537	-	0.743382	-	1,684.09	784.64	1.595537	0.743382
ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	353550	1,891.78	12,171.69	970.53	12,171.69	1.792307	-	0.919498	-	14,063.47	13,142.22	1.792307	0.919498
ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	353560	1,891.78	-	970.53	-	1.792307	-	0.919498	-	1,891.78	970.53	1.792307	0.919498
ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	353600	1,118.18	6,541.11	545.53	6,541.11	1.059384	-	0.516845	-	7,659.29	7,086.64	1.059384	0.516845
ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	353650	1,891.78	12,171.69	970.53	12,171.69	1.792307	-	0.919498	-	14,063.47	13,142.22	1.792307	0.919498
ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	353660	1,891.78	-	970.53	-	1.792307	-	0.919498	-	1,891.78	970.53	1.792307	0.919498
ASHP-SEER17_ER1_SF	353750	1,481.17	1,957.95	365.70	1,423.75	1.403287	-	0.346471	-	3,439.12	1,789.45	1.403287	0.346471
ASHP-SEER17_ROF_SF	353800	1,481.17	1,957.95	365.70	1,423.75	1.403287	-	0.346471	-	3,439.12	1,789.45	1.403287	0.346471
ASHP-SEER18_ER1_SF	353850	1,767.26	2,325.49	513.61	1,744.75	1.674334	-	0.486603	-	4,092.75	2,258.36	1.674334	0.486603
ASHP-SEER18_ROF_SF	353950	1,767.26	2,325.49	513.61	1,744.75	1.674334	-	0.486603	-	4,092.75	2,258.36	1.674334	0.486603
ASHP-SEER19_ER1_SF	354000	1,804.03	2,886.01	666.44	2,128.37	1.709171	-	0.631397	-	4,690.04	2,794.81	1.709171	0.631397
ASHP-SEER19_ROF_SF	354050	1,804.03	2,886.01	666.44	2,128.37	1.709171	-	0.631397	-	4,690.04	2,794.81	1.709171	0.631397
ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	354100	1,539.94	9,694.92	510.85	9,694.92	1.458967	-	0.483989	-	11,234.86	10,205.77	1.458967	0.483989
ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	354110	1,539.94	-	510.85	-	1.458967	-	0.483989	-	1,539.94	510.85	1.458967	0.483989
ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	354150												
ASHP-SEER17_ER1_MF	354200	921.05	1,561.25	248.43	1,130.53	0.872619	-	0.235367	-	2,482.30	1,378.96	0.872619	0.235367
ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	354250	1,835.95	10,174.02	680.07	10,174.02	1.739412	-	0.644311	-	12,009.97	10,854.09	1.739412	0.644311
ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	354260	1,835.95	-	680.07	-	1.739412	-	0.644311	-	1,835.95	680.07	1.739412	0.644311
ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	354300												
ASHP-SEER18_ER1_MF	354350	1,607.47	1,881.59	353.46	1,379.59	1.522946	-	0.334874	-	3,489.06	1,733.05	1.522946	0.334874
ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	354400	1,873.15	12,063.70	840.97	12,063.70	1.774656	-	0.796750	-	13,936.85	12,904.67	1.774656	0.796750
ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	354410	1,873.15	-	840.97	-	1.774656	-	0.796750	-	1,873.15	840.97	1.774656	0.796750
ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	354450												
ASHP-SEER19_ER1_MF	354500	1,059.55	1,561.25	386.93	1,130.53	1.003837	-	0.366584	-	2,620.80	1,517.46	1.003837	0.366584
ASHP-SEER20_ER1_SF	354550	1,621.81	2,314.98	635.98	1,796.25	1.536532	-	0.602539	-	3,936.79	2,432.23	1.536532	0.602539
ASHP-SEER20_ROF_SF	354600	1,621.81	2,314.98	635.98	1,796.25	1.536532	-	0.602539	-	3,936.79	2,432.23	1.536532	0.602539
ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	354650												
ASHP-SEER20_ER1_MF	354700	1,118.42	1,561.25	445.80	1,130.53	1.059611	-	0.422359	-	2,679.67	1,576.33	1.059611	0.422359
ASHP-SEER21_ER1_SF	354750	1,827.33	3,098.09	810.37	2,426.61	1.731246	-	0.767759	-	4,925.42	3,236.98	1.731246	0.767759
ASHP-SEER21_ROF_SF	354800	1,827.33	3,098.09	810.37	2,426.61	1.731246	-	0.767759	-	4,925.42	3,236.98	1.731246	0.767759
ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	354850	1,118.18	6,541.11	545.53	6,541.11	1.059384	-	0.516845	-	7,659.29	7,086.64	1.059384	0.516845
ASHP-SEER21_ER1_MF	354900	1,171.68	1,561.25	499.05	1,130.53	1.110071	-	0.472809	-	2,732.93	1,629.58	1.110071	0.472809
ASHP-SEER17_ROF_SF	354950	921.05	1,561.25	248.43	1,130.53	0.872619	-	0.235367	-	2,482.30	1,378.96	0.872619	0.235367
ASHP-SEER18_ROF_SF	355000	1,607.47	1,881.59	353.46	1,379.59	1.522946	-	0.334874	-	3,489.06	1,733.05	1.522946	0.334874
ASHP-SEER19_ROF_SF	355050	1,059.55	1,561.25	386.93	1,130.53	1.003837	-	0.366584	-	2,620.80	1,517.46	1.003837	0.366584
ASHP-SEER20_ROF_SF	355100	1,118.42	1,561.25	445.80	1,130.53	1.059611	-	0.422359	-	2,679.67	1,576.33	1.059611	0.422359
ASHP-SEER21_ROF_SF	355150	1,171.68	1,561.25	499.05	1,130.53	1.110071	-	0.472809	-	2,732.93	1,629.58	1.110071	0.472809
PTHP-SEER12-ER1_SF	356200	282.12	782.78	16.00	112.08	0.267286	-	0.015159	-	1,064.90	128.08	0.267286	0.015159
PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_SF	356250	319.95	2,610.79	16.00	2,610.79	0.303126	-	0.015159	-	2,930.74	2,626.79	0.303126	0.015159
PTHP-SEER12-ROF_SF	356300	282.12	782.78	16.00	112.08	0.267286	-	0.015159	-	1,064.90	128.08	0.267286	0.015159
PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_SF	356350	319.95	2,610.79	16.00	2,610.79	0.303126	-	0.015159	-	2,930.74	2,626.79	0.303126	0.015159
PTHP-SEER13-ER1_SF	356400	330.11	801.28	63.99	130.58	0.312752	-	0.060625	-	1,131.39	194.57	0.312752	0.060625
PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_SF	356450	367.94	2,629.29	63.99	2,629.29	0.348593	-	0.060625	-	2,997.23	2,693.28	0.348593	0.060625
PTHP-SEER13-ROF_SF	356500	330.11	801.28	63.99	130.58	0.312752	-	0.060625	-	1,131.39	194.57	0.312752	0.060625
PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_SF	356550	367.94	2,629.29	63.99	2,629.29	0.348593	-	0.060625	-	2,997.23	2,693.28	0.348593	0.060625
PTHP-SEER14-ER1_SF	356600	371.24	841.54	105.12	170.84	0.351719	-	0.099593	-	1,212.78	275.96	0.351719	0.099593
PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_SF	356650	409.07	2,669.55	105.12	2,669.55	0.387560	-	0.099593	-	3,078.62	2,774.67	0.387560	0.099593
PTHP-SEER14-ROF_SF	356700	371.24	841.54	105.12	170.84	0.351719	-	0.099593	-	1,212.78	275.96	0.351719	0.099593
PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_SF	356750	409.07	2,669.55	105.12	2,669.55	0.387560	-	0.099593	-	3,078.62	2,774.67	0.387560	0.099593
PTHP-SEER15-ER1_SF	356800	406.89	881.22	140.77	210.52	0.385495	-	0.133368	-	1,288.11	351.29	0.385495	0.133368
PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_SF	356850	444.72	2,709.23	140.77	2,709.23	0.421336	-	0.133368	-	3,153.95	2,850.00	0.421336	0.133368
PTHP-SEER15-ROF_SF	356900	406.89	881.22	140.77	210.52	0.385495	-	0.133368	-	1,288.11	351.29	0.385495	0.133368
PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_SF	356950	444.72	2,709.23	140.77	2,709.23	0.421336	-	0.133368	-	3,153.95	2,850.00	0.421336	0.133368