

Residential and Business Deemed Savings Table

MEEIA 2019-21¹



1. MEEIA 2019-21 Demand-Side Management Plan – refers to the Company's "2019-21 MEEIA Energy Efficiency Plan" as approved in File No. EO-2018-0211 and as subsequently amended and extended by order of the Missouri Public Service Commission.

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	
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.

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

PROGRAMS: All

Lighting

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
800050_2023_12_	C&I	LED <=11 Watt Lamp Replacing Interior Halogen A 28-52 Watt Lamp	21.94	Lighting BUS	0.0001899635	0.004301	10.0	\$15.64	per measure
800100_2023_12_	C&I	LED 7-20 Watt Lamp Replacing Interior Halogen 53-70 Watt Lamp	63.06	Lighting BUS	0.0001899635	0.012362	10.0	\$19.64	per measure
800150_2023_12_	C&I	LED <=14 Watt Lamp Replacing Interior Halogen BR/R 45-65 Watt Lamp	28.31	Lighting BUS	0.0001899635	0.005550	10.0	\$48.27	per measure
800200_2023_12_	C&I	LED <=13 Watt Lamp Replacing Interior Halogen MR-16 35-50 Watt Lamp	120.73	Lighting BUS	0.0001899635	0.023668	10.0	\$36.64	per measure
800250_2023_12_	C&I	LED <=20 Watt Lamp Replacing Interior Halogen PAR 48-90 Watt Lamp	40.60	Lighting BUS	0.0001899635	0.007959	10.0	\$74.64	per measure
800300_2019_12_	C&I	LED <=80 Watt Lamp or Fixture Replacing Interior HID 100-175 Watt Lamp or Fixture	1,129.10	Lighting BUS	0.0001899635	0.221351	15.0	\$191.39	per measure
800350_2019_12_	C&I	LED 62 - 130 Watt Lamp or Fixture Replacing Interior HID 176-300 Watt Lamp or Fixture	843.88	Lighting BUS	0.0001899635	0.165436	15.0	\$233.64	per measure
800400_2019_12_	C&I	LED 85 - 225 Watt Lamp or Fixture Replacing Interior HID 301-500 Watt Lamp or Fixture	1,040.07	Lighting BUS	0.0001899635	0.203898	15.0	\$361.64	per measure
800450_2019_12_	C&I	LED <=80 Watt Lamp or Fixture Replacing Exterior <24/7 HID 100-175 Watt Lamp or Fixture	442.18	Ext Lighting BUS	0.0000056160	0.002483	15.0	\$191.39	per measure
800500_2019_12_	C&I	LED 62 - 130 Watt Lamp or Fixture Replacing Exterior <24/7 HID 176-300 Watt Lamp or Fixture	842.07	Ext Lighting BUS	0.0000056160	0.004729	15.0	\$233.64	per measure
800550_2019_12_	C&I	LED 85 - 225 Watt Lamp or Fixture Replacing Exterior <24/7 HID 301-500 Watt Lamp or Fixture	1,540.91	Ext Lighting BUS	0.0000056160	0.008654	15.0	\$361.64	per measure
800600_2019_12_	C&I	LED <=80 Watt Lamp or Fixture Replacing Exterior 24/7 HID 100-175 Watt Lamp or Fixture Misc.	694.41	Miscellaneous BUS	0.0001379439	0.095790	15.0	\$191.39	per measure
800650_2019_12_	C&I	LED 62 - 130 Watt Lamp or Fixture Replacing Exterior 24/7 HID 176-300 Watt Lamp or Fixture Misc.	1,468.89	Miscellaneous BUS	0.0001379439	0.202624	15.0	\$233.64	per measure
800700_2019_12_	C&I	LED 85 - 225 Watt Lamp or Fixture Replacing Exterior 24/7 HID 301-500 Watt Lamp or Fixture Misc.	2,633.51	Miscellaneous BUS	0.0001379439	0.363277	15.0	\$361.64	per measure
800750_2023_12_	C&I	LED or Electroluminescent Replacing Interior Incandescent/CFL Exit Sign	261.05	Lighting BUS	0.0001899635	0.051177	7.0	\$45.25	per measure
800800_2023_12_	C&I	LED Replacing Interior T5 Fluorescent (Type A / Hybrid)	347.98	Lighting BUS	0.0001899635	0.068219	10.0	\$29.64	per measure
800801_2023_12_	C&I	LED Replacing Interior T5 Fluorescent (Type B, Kits, and Fixtures)	449.25	Lighting BUS	0.0001899635	0.088072	15.0	\$29.64	per measure
800802_2021_12_	C&I	LED Replacing Interior T5 Fluorescent (Type C)	303.22	Lighting BUS	0.0001899635	0.059444	11.0	\$29.64	per measure
800850_2023_12_	C&I	LED Replacing Interior T8 Fluorescent (Type A / Hybrid)	186.98	Lighting BUS	0.0001899635	0.036656	10.0	\$29.64	per measure
800851_2023_12_	C&I	LED Replacing Interior T8 Fluorescent (Type B, Kits, and Fixtures)	192.42	Lighting BUS	0.0001899635	0.037722	15.0	\$29.64	per measure
800852_2023_12_	C&I	LED Replacing Interior T8 Fluorescent (Type C)	179.44	Lighting BUS	0.0001899635	0.035178	11.0	\$29.64	per measure
800900_2020_12_	C&I	LED Replacing Interior T12 Fluorescent (Type A / Hybrid)	197.58	Lighting BUS	0.0001899635	0.038734	10.0	\$29.64	per measure
800901_2023_12_	C&I	LED Replacing Interior T12 Fluorescent (Type B, Kits, and Fixtures)	319.38	Lighting BUS	0.0001899635	0.062612	15.0	\$29.64	per measure
800902_2023_12_	C&I	LED Replacing Interior T12 Fluorescent (Type C)	281.76	Lighting BUS	0.0001899635	0.055237	11.0	\$29.64	per measure
800950_2023_12_	C&I	LED Specialty Lamp	99.92	Lighting BUS	0.0001899635	0.019589	10.0	\$11.94	per measure
800980_2023_12_	C&I	LED Lighting Redesign	44,626.91	Lighting BUS	0.0001899635	8.748764	15.0	\$10,000.00	per project

Lighting - Lighting Power Density (LPD)

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
800990_2021_12_	C&I	Lighting Power Density	0.708	Lighting BUS	0.0001899635	0.000139	15.0	\$0.22	per sqft

Lighting - Occupancy Sensor Lighting Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801010_2023_07_	C&I	Fixture Mounted Occupancy Sensor Controlling > 60 Watts	164.85	Lighting BUS	0.0001899635	0.032318	10.0	\$45.00	per measure
801020_2023_07_	C&I	Remote Mounted Occupancy Sensor Controlling > 150 Watts	241.34	Lighting BUS	0.0001899635	0.047313	10.0	\$105.00	per measure

ESF =Energy Savings factor (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

Lighting - LED with Network Controls

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801225_2020_12_	C&I	LED Retrofit Kit with Network Controls Replacing Interior T5 Fluorescent	157.62	Lighting BUS	0.0001899635	0.030900	15.0	\$55.76	per measure
801227_2020_12_	C&I	LED Fixture with Network Controls Replacing Interior T5 Fluorescent	157.62	Lighting BUS	0.0001899635	0.030900	15.0	\$55.76	per measure
801229_2020_12_	C&I	LED Retrofit Kit with Network Controls Replacing Interior T8 Fluorescent	186.30	Lighting BUS	0.0001899635	0.036523	15.0	\$55.76	per measure
801231_2020_12_	C&I	LED Fixture with Network Controls Replacing Interior T8 Fluorescent	331.86	Lighting BUS	0.0001899635	0.065059	15.0	\$55.76	per measure
801233_2020_12_	C&I	LED Retrofit Kit with Network Controls Replacing Interior T12 Fluorescent	312.86	Lighting BUS	0.0001899635	0.061334	15.0	\$55.76	per measure
801235_2020_12_	C&I	LED Fixture with Network Controls Replacing Interior T12 Fluorescent	361.42	Lighting BUS	0.0001899635	0.070854	15.0	\$55.76	per measure
801237_2020_12_	C&I	LED Retrofit Kit with Network Controls Replacing Interior HID	1,054.60	Lighting BUS	0.0001899635	0.206746	15.0	\$366.72	per measure
801239_2020_12_	C&I	LED Fixture with Network Controls Replacing Interior HID	1,054.60	Lighting BUS	0.0001899635	0.206746	15.0	\$366.72	per measure
801241_2022_12_	C&I	Lighting Redesign-LED Fixture w/ network controls-Replacing Linear Fluoresc	90,833.22	Lighting BUS	0.0001899635	17.807156	15.0	\$10,000.00	per project

Commercial Solid and Glass Door Refrigerators & Freezers

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

PROGRAMS: All

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801250_2019_12_	C&I	0 < V < 15 - Vertical Closed - Solid Door Refrigerator	379.86	Refrigeration BUS	0.0001357383	0.051562	12.0	\$150.00	per measure
801300_2019_12_	C&I	15 ≤ V < 30 - Vertical Closed - Solid Door Refrigerator	626.40	Refrigeration BUS	0.0001357383	0.085026	12.0	\$400.00	per measure
801350_2019_12_	C&I	30 ≤ V < 50 - Vertical Closed - Solid Door Refrigerator	982.52	Refrigeration BUS	0.0001357383	0.133366	12.0	\$550.00	per measure
801400_2019_12_	C&I	V ≥ 50 - Vertical Closed - Solid Door Refrigerator	1,311.25	Refrigeration BUS	0.0001357383	0.177987	12.0	\$700.00	per measure
801450_2019_12_	C&I	0 < V < 15 - Vertical Closed - Glass Door Refrigerator	354.29	Refrigeration BUS	0.0001357383	0.048091	12.0	\$250.00	per measure
801500_2019_12_	C&I	15 ≤ V < 30 - Vertical Closed - Glass Door Refrigerator	217.32	Refrigeration BUS	0.0001357383	0.029499	12.0	\$500.00	per measure
801550_2019_12_	C&I	30 ≤ V < 50 - Vertical Closed - Glass Door Refrigerator	226.46	Refrigeration BUS	0.0001357383	0.030739	12.0	\$1,307.00	per measure
801600_2019_12_	C&I	V ≥ 50 - Vertical Closed - Glass Door Refrigerator	372.56	Refrigeration BUS	0.0001357383	0.050571	12.0	\$2,300.00	per measure
801650_2019_12_	C&I	Horizontal Closed - Solid or Glass Door Refrigerator - All Volumes	1,219.94	Refrigeration BUS	0.0001357383	0.165593	12.0	\$525.00	per measure
801700_2019_12_	C&I	0 < V < 15 - Vertical Closed - Solid Door Freezer	348.81	Refrigeration BUS	0.0001357383	0.047347	12.0	\$150.00	per measure
801750_2019_12_	C&I	15 ≤ V < 30 - Vertical Closed - Solid Door Freezer	1,307.60	Refrigeration BUS	0.0001357383	0.177491	12.0	\$400.00	per measure
801800_2019_12_	C&I	30 ≤ V < 50 - Vertical Closed - Solid Door Freezer	2,403.35	Refrigeration BUS	0.0001357383	0.326227	12.0	\$550.00	per measure
801850_2019_12_	C&I	V ≥ 50 - Vertical Closed - Solid Door Freezer	2,951.22	Refrigeration BUS	0.0001357383	0.400594	12.0	\$700.00	per measure
801900_2019_12_	C&I	0 < V < 15 - Vertical Closed - Glass Door Freezer	1,429.95	Refrigeration BUS	0.0001357383	0.194099	12.0	\$220.00	per measure
801950_2019_12_	C&I	15 ≤ V < 30 - Vertical Closed - Glass Door Freezer	3,186.81	Refrigeration BUS	0.0001357383	0.432572	12.0	\$950.00	per measure
802000_2019_12_	C&I	30 ≤ V < 50 - Vertical Closed - Glass Door Freezer	5,150.03	Refrigeration BUS	0.0001357383	0.699056	12.0	\$1,307.00	per measure
802050_2019_12_	C&I	V ≥ 50 - Vertical Closed - Glass Door Freezer	5,884.18	Refrigeration BUS	0.0001357383	0.798709	12.0	\$2,300.00	per measure
802100_2019_12_	C&I	Horizontal Closed - Solid or Glass Door Freezer - All Volumes	5,265.08	Refrigeration BUS	0.0001357383	0.714673	12.0	\$595.00	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_2019_12_	C&I	Anti-Sweat Heater Controls Refrigerator	668.14	Refrigeration BUS	0.0001357383	0.090692	12.0	\$151.00	per door
802200_2019_12_	C&I	Anti-Sweat Heater Controls Freezer	770.93	Refrigeration BUS	0.0001357383	0.104645	12.0	\$151.00	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_2019_12_	C&I	Heat Pump Water Heater w/ 98% Efficiency 2.9-14.6 kW (10 to 50 MBH)	21,156.00	Water Heating BUS	0.0001811545	3.832505	15.0	\$4,000.00	per measure
802300_2019_12_	C&I	Heat Pump Water Heater w/ 98% Efficiency 14.7-29.3 kW (50 to 100 MBH)	52,890.00	Water Heating BUS	0.0001811545	9.581262	15.0	\$7,000.00	per measure
802350_2019_12_	C&I	Heat Pump Water Heater w/ 98% Efficiency 29.4-87.9 kW (100 to 300 MBH)	141,041.00	Water Heating BUS	0.0001811545	25.550212	15.0	\$10,000.00	per measure
802400_2019_12_	C&I	Heat Pump Water Heater w/ 98% Efficiency 88-146.5 kW (300 to 500 MBH)	282,081.00	Water Heating BUS	0.0001811545	51.100243	15.0	\$14,000.00	per measure
802450_2019_12_	C&I	Heat Pump Water Heater w/ 98% Efficiency >146.6 kW (above 500 MBH)	423,122.00	Water Heating BUS	0.0001811545	76.650454	15.0	\$18,000.00	per measure

Heat Pump Pool Heater

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost (per unit)	Units
802500_2019_12_	C&I	Pool Heater Heat Pump (Uncovered)	35,272.88	Water Heating BUS	0.0001811545	6.389841	15.00	\$1,000.00	per measure
802550_2019_12_	C&I	Pool Heater Heat Pump (Covered)	6,206.88	Water Heating BUS	0.0001811545	1.124404	15.00	\$1,000.00	per measure

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_	C&I	Pool Pump w/ Variable Frequency Drive	1,747.00	Motors BUS	0.0001379439	0.240988	10.00	\$246.00	per measure
802650_2019_12_	C&I	Pool Pump Timer	601.28	Motors BUS	0.0001379439	0.082943	10.00	\$100.00	per measure

Steam Cookers

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
802700_2019_12_	C&I	3 Pan ENERGY STAR Steam Cooker	7,856.31	Cooking BUS	0.0001998949	1.570436	12.0	\$4,150.00	per measure
802750_2019_12_	C&I	4 Pan ENERGY STAR Steam Cooker	9,213.50	Cooking BUS	0.0001998949	1.841732	12.0	\$4,150.00	per measure
802800_2019_12_	C&I	5 Pan ENERGY STAR Steam Cooker	10,512.97	Cooking BUS	0.0001998949	2.101489	12.0	\$4,150.00	per measure
802850_2019_12_	C&I	6 Pan ENERGY STAR Steam Cooker	11,818.65	Cooking BUS	0.0001998949	2.362488	12.0	\$4,150.00	per measure

Holding Cabinet

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
802900_2019_12_	C&I	ENERGY STAR Hot Holding Cabinet (0 < V < 13)	709.50	Cooking BUS	0.0001998949	0.141825	12.00	\$1,783.00	per measure
802950_2019_12_	C&I	ENERGY STAR Hot Holding Cabinet (13 ≤ V < 28)	2,772.25	Cooking BUS	0.0001998949	0.554159	12.00	\$1,783.00	per measure
803000_2019_12_	C&I	ENERGY STAR Hot Holding Cabinet (28 ≤ V)	4,438.34	Cooking BUS	0.0001998949	0.887202	12.00	\$1,783.00	per measure

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

PROGRAMS: All

HVAC

Measure Reference No.	Program/ Channel	Measure	Cooling kWh Annual Savings (per ton)	Heating kWh Annual Savings (per ton)	Total kWh Annual Savings	End Use	End Use	kW Factor	kW	EUL	Inc. Cost	Units
803050_2019_12_	C&I	Learning Thermostat	205.34	233.0	438.3	Cooling BUS	Heating BUS	0.0009106840	0.187000	10.00	\$224.00	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per HP)	Units
803100_2020_07_	C&I	VFD on Chilled Water Pump >= 1HP	1,289.6	Cooling BUS	0.0009106840	1.174455	15.00	\$179.00	per Hp
803150_2020_07_	C&I	VFD on Hot Water Pump >= 1HP	1,696.6	HVAC BUS	0.0004439830	0.753248	15.00	\$179.00	per Hp
803155_2020_07_	C&I	VFD on Condenser Water Pump >= 1HP	1,289.6	Cooling BUS	0.0009106840	1.174455	15.00	\$179.00	per Hp
803160_2020_07_	C&I	VFD on Cooling Tower Fan >= 1HP	479.5	HVAC BUS	0.0004439830	0.212881	15.00	\$179.00	per Hp

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost (per HP)	Units
803200_2020_07_	C&I	VFD on HVAC Fans >= 1HP	939.75	HVAC BUS	0.0004439830	0.417233	15.00	\$168.00	per Hp

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per ton)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
803250_2023_07_	C&I	Single Packag or Split Sytem Unitary AC_DX 135 - 240kbtu	133.17	Cooling BUS	0.0009106840	0.121276	15.0	\$100.00	per ton
803300_2023_07_	C&I	Single Packag or Split Sytem Unitary AC_DX 240 - 760kbtu	143.84	Cooling BUS	0.0009106840	0.130993	15.0	\$100.00	per ton
803350_2023_07_	C&I	Single Packag or Split Sytem Unitary AC_DX 65 -135kbtu	131.41	Cooling BUS	0.0009106840	0.119673	15.0	\$100.00	per ton
803400_2023_07_	C&I	Single Packag or Split Sytem Unitary AC_DX >760kbtu	153.77	Cooling BUS	0.0009106840	0.140036	15.0	\$100.00	per ton
803450_2020_07_	C&I	Single Packag or Split Sytem Unitary AC_DX <65kbtu	129.60	Cooling BUS	0.0009106840	0.118025	15.0	\$100.00	per ton

Measure Reference No.	Program/ Channel	Measure	Cooling kWh Annual Savings (per ton)	Heating kWh Annual Savings (per ton)	Total kWh Annual Savings	End Use	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803500_2023_12_	C&I	GSHP <135kbtu; ≥17EER	31.92	195.01	226.93	Cooling BUS	Heating BUS	0.0009106840	0.029069	15.0	\$180.00	per ton
803550_2023_12_	C&I	GSHP <135kbtu; ≥19EER	110.16	195.01	305.17	Cooling BUS	Heating BUS	0.0009106840	0.100321	15.0	\$180.00	per ton
803600_2023_07_	C&I	ASHP 65 - 135kbtu	110.01	223.04	333.05	Cooling BUS	Heating BUS	0.0009106840	0.100184	15.0	\$100.00	per ton
803650_2023_07_	C&I	ASHP 135 - 240kbtu	117.31	265.20	382.51	Cooling BUS	Heating BUS	0.0009106840	0.106832	15.0	\$100.00	per ton
803700_2023_07_	C&I	ASHP >240kbtu	130.23	265.20	395.43	Cooling BUS	Heating BUS	0.0009106840	0.118598	15.0	\$100.00	per ton
803750_2023_07_	C&I	ASHP <65kbtu	97.73	122.01	219.74	Cooling BUS	Heating BUS	0.0009106840	0.089001	15.0	\$100.00	per ton

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per ton)	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803800_2023_12_	C&I	Air Cooled Chiller	321.48	Cooling BUS	0.0009106840	0.292767	20.0	\$106.23	per ton
803810_2023_12_	C&I	Water Cooled Chiller	113.72	Cooling BUS	0.0009106840	0.103563	20.0	\$106.23	per ton

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per ton)	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803820_2022_12_	C&I	Air Cooled Chiller Tune up	80.95	Cooling BUS	0.0009106840	0.07372	5.0	\$5.00	per ton
803825_2022_12_	C&I	Water Cooled Chiller Tune up	48.86	Cooling BUS	0.0009106840	0.044496	5.0	\$5.00	per ton

Appliances

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
803850_2019_12_	C&I	Clothes Washer (Electric DHW; Electric Dryer)	907.62	Miscellaneous BUS	0.0001379439	0.125201	11.00	\$200.00	per measure
803900_2019_12_	C&I	Clothes Washer (Gas DHW; Electric Dryer)	308.41	Miscellaneous BUS	0.0001379439	0.042543	11.00	\$200.00	per measure
803950_2019_12_	C&I	Clothes Washer (Electric DHW; Gas Dryer)	750.78	Miscellaneous BUS	0.0001379439	0.103566	11.00	\$200.00	per measure
804000_2019_12_	C&I	Clothes Washer (Gas DHW; Gas Dryer)	151.57	Miscellaneous BUS	0.0001379439	0.020908	11.00	\$200.00	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
804050_2019_12_	C&I	Clothes Dryer Vented Electric, Standard (≥ 4.4 ft3)	840.73	Miscellaneous BUS	0.0001379439	0.115974	14.00	\$75.00	per measure
804100_2019_12_	C&I	Clothes Dryer Vented Electric, Compact (120V) (< 4.4 ft3)	307.28	Miscellaneous BUS	0.0001379439	0.042387	14.00	\$105.00	per measure
804150_2019_12_	C&I	Clothes Dryer Vented Electric, Compact (240V) (<4.4 ft3)	340.11	Miscellaneous BUS	0.0001379439	0.046916	14.00	\$105.00	per measure
804200_2019_12_	C&I	Clothes Dryer Ventless Electric, Compact (240V) (<4.4 ft3)	428.66	Miscellaneous BUS	0.0001379439	0.059131	14.00	\$105.00	per measure
804250_2019_12_	C&I	Clothes Dryer Vented Gas	40.57	Miscellaneous BUS	0.0001379439	0.005596	14.00	\$75.00	per measure

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

PROGRAMS: All

Compressed Air

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
804300_2019_12_	C&I	No Loss Condensate Drain (Reciprocating - On/off Control)	3,272.3	Air Comp BUS	0.0001379439	0.451388	13.00	\$700.00	per measure
804350_2019_12_	C&I	No Loss Condensate Drain (Reciprocating - Load/Unload)	2,418.6	Air Comp BUS	0.0001379439	0.333634	13.00	\$700.00	per measure
804400_2019_12_	C&I	No Loss Condensate Drain (Screw - Load/Unload)	2,703.2	Air Comp BUS	0.0001379439	0.372886	13.00	\$700.00	per measure
804450_2019_12_	C&I	No Loss Condensate Drain (Screw - Inlet Modulation)	978.1	Air Comp BUS	0.0001379439	0.134926	13.00	\$700.00	per measure
804500_2019_12_	C&I	No Loss Condensate Drain (Screw - Inlet Modulation w/ Unloading)	978.1	Air Comp BUS	0.0001379439	0.134926	13.00	\$700.00	per measure
804550_2019_12_	C&I	No Loss Condensate Drain (Screw - Variable Displacement)	2,721.0	Air Comp BUS	0.0001379439	0.375338	13.00	\$700.00	per measure
804600_2019_12_	C&I	No Loss Condensate Drain (Screw - VFD)	3,165.6	Air Comp BUS	0.0001379439	0.436668	13.00	\$700.00	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
804650_2019_12_	C&I	Compressed Air Nozzle (Reciprocating - On/off Control)	1,547.21	Air Comp BUS	0.0001379439	0.213428	15.00	\$77.00	per measure
804700_2019_12_	C&I	Compressed Air Nozzle (Reciprocating - Load/Unload)	1,203.38	Air Comp BUS	0.0001379439	0.165999	15.00	\$77.00	per measure
804750_2019_12_	C&I	Compressed Air Nozzle (Screw - Load/Unload)	1,289.34	Air Comp BUS	0.0001379439	0.177857	15.00	\$77.00	per measure
804800_2019_12_	C&I	Compressed Air Nozzle (Screw - Inlet Modulation)	515.74	Air Comp BUS	0.0001379439	0.071143	15.00	\$77.00	per measure
804850_2019_12_	C&I	Compressed Air Nozzle (Screw - Inlet Modulation w/ Unloading)	515.74	Air Comp BUS	0.0001379439	0.071143	15.00	\$77.00	per measure
804900_2019_12_	C&I	Compressed Air Nozzle (Screw - Variable Displacement)	1,289.34	Air Comp BUS	0.0001379439	0.177857	15.00	\$77.00	per measure
804950_2019_12_	C&I	Compressed Air Nozzle (Screw - VFD)	1,547.21	Air Comp BUS	0.0001379439	0.213428	15.00	\$77.00	per measure

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per HP)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805000_2023_07_	C&I	VSD Air Compressor 5-40 HP	949.4	Air Comp BUS	0.0001379439	0.130961	10.00	"=((127*HPcomp)+1446)*1.24"	per HP
805001_2023_07_	C&I	VSD Air Compressor >40-50 HP	949.4	Air Comp BUS	0.0001379439	0.130961	10.00	"=((127*HPcomp)+1446)*1.24"	per HP
805002_2023_07_	C&I	VSD Air Compressor 50-200 HP	1,052.0	Air Comp BUS	0.0001379439	0.145120	10.00	"=((127*HPcomp)+1446)*1.24"	per HP

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per CFM Reduced)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805020_2022_12_	C&I	Leak Repair (Reciprocating - On/off Control)	1,090.75	Air Comp BUS	0.0001379439	0.150462	2.00	Actual	per CFM Reduced
805022_2022_12_	C&I	Leak Repair (Reciprocating - Load/Unload)	806.21	Air Comp BUS	0.0001379439	0.111212	2.00	Actual	per CFM Reduced
805024_2022_12_	C&I	Leak Repair (Screw - Load/Unload)	901.06	Air Comp BUS	0.0001379439	0.124296	2.00	Actual	per CFM Reduced
805026_2022_12_	C&I	Leak Repair (Screw - Inlet Modulation)	326.04	Air Comp BUS	0.0001379439	0.044975	2.00	Actual	per CFM Reduced
805028_2022_12_	C&I	Leak Repair (Screw - Inlet Modulation w/ Unloading)	326.04	Air Comp BUS	0.0001379439	0.044975	2.00	Actual	per CFM Reduced
805030_2022_12_	C&I	Leak Repair (Screw - Variable Displacement)	906.98	Air Comp BUS	0.0001379439	0.125112	2.00	Actual	per CFM Reduced
805032_2022_12_	C&I	Leak Repair (Screw - VFD)	1,055.18	Air Comp BUS	0.0001379439	0.145556	2.00	Actual	per CFM Reduced

Combination Oven

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805050_2019_12_	C&I	Combination Oven (Pan Capacity < 15)	6,372.30	Cooking BUS	0.0001998949	1.27379	12.0	\$4,300.00	per measure
805100_2019_12_	C&I	Combination Oven (Pan Capacity ≥ 15)	11,743.62	Cooking BUS	0.0001998949	2.34749	12.0	\$4,300.00	per measure

Fryer

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805150_2019_12_	C&I	Standard Open Deep-Fat Fryer	952.31	Cooking BUS	0.0001998949	0.190362	12.0	\$210.00	per measure
805200_2019_12_	C&I	Large Vat Open Deep-Fat Fryer	2,537.84	Cooking BUS	0.0001998949	0.507301	12.0	\$0.00	per measure

Convection Oven

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805250_2019_12_	C&I	Convection Oven (Full Size)	1,938.47	Cooking BUS	0.0001998949	0.38749	12.0	\$0.00	per measure
805300_2019_12_	C&I	Convection Oven (Half Size)	192.11	Cooking BUS	0.0001998949	0.038402	12.0	\$0.00	per measure

Griddle

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805350_2019_12_	C&I	Griddle	1,910.38	Cooking BUS	0.0001998949	0.381875	12.0	\$0.00	per measure

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

PROGRAMS: All

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_	C&I	Kitchen Demand Ventilation Controls, Retrofit	4,197.00	Cooking BUS	0.0001998949	0.838959	15.0	\$1,991.00	per HP
805410_2020_07_	C&I	Kitchen Demand Ventilation Controls, New	4,197.00	Cooking BUS	0.0001998949	0.838959	15.0	\$1,991.00	per HP

Pre-Rinse Spray Valve

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805450_2019_12_	C&I	Pre-Rinse Spray Valve	5,786.53	Cooking BUS	0.0001998949	1.156698	5.0	\$92.90	per measure

Low Flow Faucet Aerator

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805500_2019_12_	C&I	Low Flow Faucet Aerator	86.63	Water Heating BUS	0.0001811545	0.015693	9.0	\$8.00	per measure

Circulator Pump

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805550_2019_12_	C&I	Circulator Pump	651.00	Miscellaneous BUS	0.0001379439	0.089801	15.0	\$1,200.00	per measure

Small Commercial Programmable Thermostats

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per sqft)	End Use	kW Factor	kW	EUL	Inc. Cost (per unit)	Units
805600_2019_12_	C&I	Small Commercial Programmable Thermostats	0.03	Cooling BUS	0.0009106840	0.000027	8.0	\$181.00	per measure

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_	C&I	Demand Controlled Ventilation (Gas Heat)	0.67	Cooling BUS	0.0009106840	0.00061	10.00	Actual	per sq. ft.
805700_2019_12_	C&I	Demand Controlled Ventilation (Electric Heat)	1.90	Cooling BUS	0.0009106840	0.00173	10.00	Actual	per sq. ft.
805750_2019_12_	C&I	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_	C&I	Advanced RTU Controls	3,779.33	HVAC BUS	0.0004439830	1.677958	15.0	\$4,038.00	per measure

PTAC & PTHP

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per ton) first 5 years	kWh Annual Savings (per ton) next ten years	End Use	kW Factor	kW (per ton) first 5 years	kW (per ton) next ten years	EUL	Inc. Cost (per ton)	Units
805850_2019_12_	C&I	PTAC	411.27	10.5	Cooling BUS	0.0009106840	0.3745	0.010	15.0	\$1,047.00	per ton
805900_2019_12_	C&I	PTHP	715.42	177.1	Cooling BUS	0.0009106840	0.3745	0.019	15.0	\$1,047.00	per ton

Refrigerated Beverage Vending Machine

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per cubicft)	End Use	kW Factor	kW	EUL	Inc. Cost	Units
805950_2019_12_	C&I	Refrigerated Beverage Vending Machine (Class A)	0.13	Refrigeration BUS	0.0001357383	0.000018	12.0	\$140.00	per measure
806000_2019_12_	C&I	Refrigerated Beverage Vending Machine (Class B)	0.32	Refrigeration BUS	0.0001357383	0.000043	12.0	\$140.00	per measure

ECM for Walk-in & Reach-in Coolers/Freezers

Measure Reference No.	Program/ Channel	Measure	kWh Annual Savings (per motor)	End Use	kW Factor	kW	EUL	Inc. Cost (per motor)	Units
806050_2019_12_	C&I	ECM for Walk-in & Reach-in Coolers/Freezers	1,409.00	Miscellaneous BUS	0.0001379439	0.194363	15.0	\$177.00	per motor

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

PROGRAMS: All

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
806100_2020_07_	C&I	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_	C&I	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_	C&I	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 (per motor)	Units
999999_2019_12	C&I	Custom	Custom	Variable	Variable	Custom	Custom	Custom	Custom

RESIDENTIAL LIGHTING

Lighting Program

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
200050_2023_12	Lighting	LED - 10.5W Downlight E26 (CFL baseline)	6.68	0.001026	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.72	0.96	0.0009	0.0002	19.0	6.0	\$	1.66 per bulb
200100_2019_12	Lighting	LED - 10.5W Downlight E26 (Halogen baseline)	40.38	0.006263	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	34.57	5.81	0.0052	0.0011	19.0	6.0	\$	1.66 per bulb
200150_2023_12	Lighting	LED - 10W (CFL baseline) (750-1049 lumens)	10.50	0.001629	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	8.99	1.51	0.0013	0.0003	19.0	6.0	\$	1.45 per bulb
200200_2019_12	Lighting	LED - 10W (Halogen baseline) (750-1049 lumens)	32.29	0.005009	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.65	4.65	0.0041	0.0009	19.0	6.0	\$	1.45 per bulb
200250_2023_12	Lighting	LED - 12W Dimmable Light Bulb (Replacing CFL)	3.95	0.000612	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.38	0.57	0.0005	0.0001	19.0	6.0	\$	1.66 per bulb
200300_2023_12	Lighting	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent)	3.95	0.000612	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.38	0.57	0.0005	0.0001	19.0	6.0	\$	1.66 per bulb
200350_2019_12	Lighting	LED - 15W (Halogen baseline) (1050-1489 lumens)	38.17	0.005921	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	32.68	5.49	0.0049	0.0010	19.0	6.0	\$	1.45 per bulb
200400_2023_12	Lighting	LED - 15W (CFL baseline) (1050-1489 lumens)	16.14	0.002503	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	13.81	2.32	0.0021	0.0004	19.0	6.0	\$	1.45 per bulb
200401_2023_12	Lighting	LED - 11W Flood Light BR30 Bulb (CFL baseline)	3.82	0.000592	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.27	0.55	0.0005	0.0001	19.0	6.0	\$	1.66 per bulb
200402_2020_12	Lighting	LED - 11W Flood Light BR30 Bulb (Halogen baseline)	51.54	0.007995	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	44.13	7.41	0.0066	0.0014	19.0	6.0	\$	1.66 per bulb
200450_2023_12	Lighting	LED - 15W Flood Light PAR30 Bulb (CFL baseline)	14.32	0.002221	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	12.26	2.06	0.0018	0.0004	19.0	6.0	\$	1.66 per bulb
200500_2019_12	Lighting	LED - 15W Flood Light PAR30 Bulb (Halogen baseline)	48.97	0.007595	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	41.92	7.04	0.0063	0.0013	19.0	6.0	\$	1.66 per bulb
200550_2023_12	Lighting	LED - 18W Flood Light PAR30 Bulb (CFL baseline)	6.68	0.001036	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.72	0.96	0.0009	0.0002	19.0	6.0	\$	1.66 per bulb
200600_2019_12	Lighting	LED - 18W Flood Light PAR30 Bulb (Halogen baseline)	78.27	0.012140	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	67.01	11.26	0.0100	0.0021	19.0	6.0	\$	1.66 per bulb
200650_2023_12	Lighting	LED - 20W (CFL baseline) (1490-2600 lumens)	28.19	0.004372	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	24.13	4.05	0.0036	0.0008	19.0	6.0	\$	1.45 per bulb
200700_2019_12	Lighting	LED - 20W (Halogen baseline) (1490-2600 lumens)	53.01	0.008222	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	45.38	7.63	0.0068	0.0014	19.0	6.0	\$	1.45 per bulb
200750_2023_12	Lighting	LED - 4W Candelabra (CFL baseline)	4.64	0.000720	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.97	0.67	0.0006	0.0001	19.0	6.0	\$	1.66 per bulb
200800_2023_12	Lighting	LED - 4W Candelabra (Replacing Specialty Incandescent)	4.93	0.000765	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.22	0.71	0.0006	0.0001	19.0	6.0	\$	1.66 per bulb
200850_2023_12	Lighting	LED - RW Globe Light G25 Bulb (Replacing CFL)	6.61	0.001025	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.66	0.95	0.0008	0.0002	19.0	6.0	\$	1.66 per bulb
200900_2023_12	Lighting	LED - RW Globe Light G25 Bulb (Replacing Specialty Incandescent)	6.61	0.001025	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.66	0.95	0.0008	0.0002	19.0	6.0	\$	1.66 per bulb
200950_2019_12	Lighting	LED - 10W (Halogen baseline) (750-1049 lumens) - Specialty Connected Light	30.67	0.004758	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	26.26	4.41	0.0039	0.0008	19.0	6.0	\$	20.00 per bulb
201000_2019_12	Lighting	LED - 15W (Halogen baseline) (1050-1489 lumens) - Specialty Connected Light	40.34	0.006257	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	34.54	5.80	0.0052	0.0011	19.0	6.0	\$	20.00 per bulb
201050_2019_12	Lighting	LED - 15W Flood Light PAR30 Bulb (Halogen baseline) - Specialty Connected Light	48.53	0.007527	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	41.55	6.98	0.0062	0.0013	19.0	6.0	\$	20.00 per bulb
201099_2023_12	Lighting	LED - 6W (CFL baseline) (310-749 lumens)	5.41	0.000840	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.63	0.78	0.0007	0.0001	19.0	6.0	\$	1.45 per bulb
201100_2019_12	Lighting	LED - 6W (Halogen baseline) (310-749 lumens)	21.47	0.003330	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	18.38	3.09	0.0027	0.0006	19.0	6.0	\$	1.45 per bulb
201130_2023_12	Lighting	LED Nightlights	26.05	0.003935	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	24.90	1.15	0.0037	0.0002	19.0	6.0	\$	3.35 per bulb

**Measure Descriptions with reference to "(CFL Baseline)" are in fact aligned to the May 2022 EISA standards putting into effect the 45 lumens/watt backstop provision
*EUL-BUS based on MD TRM - 20,000 hours total life; 3,351 annual hours of use for average building type.

RESIDENTIAL EFFICIENT PRODUCTS

Heat Pump Hot Water Heater

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kWh _{cool}	kWh _{heat} - Electric Resistance	kWh _{heat} - Heat Pumps	kW	EUL	Inc. Cost	Units
250050_2019_12_	Efficient Products	Heat Pump Hot Water Heater	2,276.14	Water Heating RES	0.000887318	383.38	153.81	96.43	0.201966	13.0	\$588.00	per measure

Learning Thermostat / Advanced Thermostat

*CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
250100_2021_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling SF	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250100_2021_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling SF	550.48	Heating RES	0.0000000000	0.000000	10.0		per measure
250101_2021_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling MF	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250101_2021_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling MF	357.82	Heating RES	0.0000000000	0.000000	10.0		per measure
250102_2021_12_	Efficient Products_CompE	Learning Thermostat - ASHP heating/cooling MF_CompE	138.33	Cooling RES	0.0009474181	0.131056	10.0	\$125.00	per measure
250102_2021_12_	Efficient Products_CompE	Learning Thermostat - ASHP heating/cooling MF_CompE	121.74	Heating RES	0.0000000000	0.000000	10.0		per measure
250150_2021_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC MF	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250150_2021_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC MF	608.22	Heating RES	0.0000000000	0.000000	10.0		per measure
250151_2021_12_	Efficient Products_CompE	Learning Thermostat - electric furnace heating / central AC MF_CompE	138.33	Cooling RES	0.0009474181	0.131056	10.0	\$125.00	per measure
250151_2021_12_	Efficient Products_CompE	Learning Thermostat - electric furnace heating / central AC MF_CompE	206.94	Heating RES	0.0000000000	0.000000	10.0		per measure
250250_2021_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC SF	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250250_2021_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC SF	935.72	Heating RES	0.0000000000	0.000000	10.0		per measure
250350_2021_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC SF**	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250350_2021_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC SF**	41.35	Heating RES	0.0000000000	0.000000	10.0		per measure
250351_2021_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC MF**	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250351_2021_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC MF**	26.88	Heating RES	0.0000000000	0.000000	10.0		per measure
250352_2021_12_	Efficient Products_CompE	Learning Thermostat - Gas Heated / central AC MF_CompE**	138.33	Cooling RES	0.0009474181	0.131056	10.0	\$125.00	per measure
250352_2021_12_	Efficient Products_CompE	Learning Thermostat - Gas Heated / central AC MF_CompE**	26.88	Heating RES	0.0000000000	0.000000	10.0		per measure
250450_2021_12_	Efficient Products	Learning Thermostat - Unknown SF**	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250450_2021_12_	Efficient Products	Learning Thermostat - Unknown SF**	276.79	Heating RES	0.0000000000	0.000000	10.0		per measure
250451_2021_12_	Efficient Products	Learning Thermostat - Unknown MF**	190.21	Cooling RES	0.0009474181	0.180208	10.0	\$125.00	per measure
250451_2021_12_	Efficient Products	Learning Thermostat - Unknown MF**	179.91	Heating RES	0.0000000000	0.000000	10.0		per measure
250452_2021_12_	Efficient Products_CompE	Learning Thermostat - Unknown MF_CompE**	138.33	Cooling RES	0.0009474181	0.131056	10.0	\$125.00	per measure
250452_2021_12_	Efficient Products_CompE	Learning Thermostat - Unknown MF_CompE**	73.09	Heating RES	0.0000000000	0.000000	10.0		per measure

High Efficiency Pool Pumps

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
250500_2021_12_	Efficient Products	ENERGY STAR Pool Pump and motor w auto controls - multi speed	0.00	Pool Spa RES	0.0002354459	0.000000	10.0	\$0.00	per measure
250550_2021_12_	Efficient Products	ENERGY STAR VFDs on Residential Swimming Pool Pumps - ROF	315.21	Pool Spa RES	0.0002354459	0.074215	10.0	\$314.00	per measure
250551_2021_12_	Efficient Products	ENERGY STAR VFDs on Residential Swimming Pool Pumps - ER	1,478.34	Pool Spa RES	0.0002354459	0.348069	10.0	\$549.00	per measure

Advanced Power Strips Tier 2 / Advanced Control Strategies

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
250600_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - A	237.60	Miscellaneous RES	0.0001148238	0.027282	10.0	\$30.00	per measure
250650_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - B	216.00	Miscellaneous RES	0.0001148238	0.024802	10.0	\$30.00	per measure
250700_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - C	194.40	Miscellaneous RES	0.0001148238	0.022322	10.0	\$30.00	per measure
250750_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - D	172.80	Miscellaneous RES	0.0001148238	0.019842	10.0	\$30.00	per measure
250800_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - E	151.20	Miscellaneous RES	0.0001148238	0.017361	10.0	\$30.00	per measure
250850_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - F	129.60	Miscellaneous RES	0.0001148238	0.014881	10.0	\$30.00	per measure
250900_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - G	108.00	Miscellaneous RES	0.0001148238	0.012401	10.0	\$30.00	per measure
250950_2019_12_	Efficient Products	Advanced Tier 2 Power Strips - H	86.40	Miscellaneous RES	0.0001148238	0.009921	10.0	\$30.00	per measure
251000_2019_12_	Efficient Products	Advanced Tier 2 Power Strips / TOS/NC / Average	151.96	Miscellaneous RES	0.0001148238	0.017449	10.0	\$30.00	per measure
251001_2020_12_	Efficient Products	Advanced Tier 2 Power Strips / DI / Average	153.90	Miscellaneous RES	0.0001148238	0.017671	10.0	\$60.00	per measure

ENERGY STAR Air Purifier

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
251050_2019_12_	Efficient Products	ENERGY STAR Air Purifier/Cleaner	578.86	HVAC RES	0.0004660805	0.269795	9.0	\$70.00	per measure

RESIDENTIAL EFFICIENT PRODUCTS

ENERGY STAR Dehumidifier

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
251100_2019_12_	Efficient Products	ENERGY STAR Dehumidifier	204.00	Cooling RES	0.0009474181	0.193273	12.0	\$5.00	per measure

Energy Star Room AC

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
251150_2019_12_	Efficient Products	ENERGY STAR Room AC (kWh w ISR)	49.5	Cooling RES	0.0009474181	0.046859	9.0	\$20.00	per measure
251200_2019_12_	Efficient Products	ENERGY STAR Room AC (kWh w/o ISR)	50.7	Cooling RES	0.0009474181	0.048072	9.0	\$20.00	per measure

Low Flow Handheld Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
251300_2022_12_	Efficient Products	Low Flow Handheld Showerhead SF	86.90	Water heating RES	0.000887318	0.109	0.007711	10.0	\$15.02	per measure
251350_2022_12_	Efficient Products	Low Flow Handheld Showerhead MF	98.65	Water heating RES	0.000887318	0.109	0.008753	10.0	\$15.02	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
300050_2019_12_	School	Dirty Filter Alarm_SF	53.75	HVAC RES	0.0004660805	34.00	19.75	0.025052	14.0	\$5.00	per measure
300051_2020_12_	IE	Dirty Filter Alarm_SF - IE Kits	98.22	HVAC RES	0.0004660805	62.13	36.09	0.045778	14.0	\$5.00	per measure
300060_2021_12_	ARP	Dirty Filter Alarm_SF - ARP Kits	15.27	HVAC RES	0.0004660805	9.66	5.61	0.007117	14.0	\$5.00	per measure
300100_2019_12_	School	Dirty Filter Alarm_MF	177.38	HVAC RES	0.0004660805	112.20	65.18	0.082673	14.0	\$5.00	per measure
300101_2019_12_	School	Dirty Filter Alarm_MF_CompE	85.65	HVAC RES	0.0004660805	38.25	47.40	0.039920	14.0	\$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
300150_2023_12_	School	LED - 10W (CFL baseline) (750-1049 lumens)	7.18	Lighting RES	0.0001492529	0.001072	19.0	\$1.95	per measure
300200_2023_12_	MF	LED - 10W (CFL baseline) (750-1049 lumens)	10.84	Lighting RES	0.0001492529	0.001618	19.0	\$1.95	per measure
300250_2019_12_	School	LED - 10W (Halogen baseline) (750-1049 lumens)	22.19	Lighting RES	0.0001492529	0.003312	19.0	\$1.95	per measure
300251_2020_12_	IE	LED - 10W (Halogen baseline) (750-1049 lumens) - IE Kit	30.15	Lighting RES	0.0001492529	0.004500	19.0	\$1.95	per measure
300260_2020_12_	ARP	LED - 10W (Halogen baseline) (750-1049 lumens) - ARP Kit	29.48	Lighting RES	0.0001492529	0.004400	19.0	\$1.95	per measure
300300_2019_12_	MF	LED - 10W (Halogen baseline) (750-1049 lumens)	33.50	Lighting RES	0.0001492529	0.005000	19.0	\$1.95	per measure
300350_2023_12_	School	LED - 10.5W Downlight E26 (CFL baseline)	3.92	Lighting RES	0.0001492529	0.000585	19.0	\$1.95	per measure
300400_2023_12_	MF	LED - 10.5W Downlight E26 (CFL baseline)	5.91	Lighting RES	0.0001492529	0.000882	19.0	\$1.95	per measure
300401_2020_12_	IE	LED 8W Globe Light G25 Bulb (Halogen Baseline) - IE Kit	32.10	Lighting RES	0.0001492529	0.004791	19.0	\$1.95	per measure
300402_2020_12_	IE	LED 20W (Halogen baseline) (1490-2600 lumens) - IE Kit	50.36	Lighting RES	0.0001492529	0.007516	19.0	\$1.95	per measure
300403_2020_12_	IE	LED 15W Flood Light PAR30 Bulb (Halogen Baseline) - IE Kit	45.49	Lighting RES	0.0001492529	0.006790	19.0	\$1.95	per measure
300430_2021_12_	IE	LED Nightlights	26.15	Lighting RES	0.0001492529	0.003903	19.0	\$1.95	per measure

Kit Faucet Aerators (Kitchen)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
300450_2019_12_	School	Kit Faucet Aerator (Kitchen)	29.75	Water Heating RES	0.0000887318	0.079	0.002640	\$10.00	\$3.00	per measure
300460_2020_12_	ARP	Kit Faucet Aerator (Kitchen) - ARP Kits	12.77	Water Heating RES	0.0000887318	0.079	0.001133	\$10.00	\$3.00	per measure
300500_2019_12_	MF	Kit Faucet Aerator (Kitchen)	99.55	Water Heating RES	0.0000887318	0.079	0.008833	\$10.00	\$3.00	per measure
300501_2020_12_	IE	Kit Faucet Aerator (Kitchen) - SFIE Kits	43.69	Water Heating RES	0.0000887318	0.079	0.003877	\$10.00	\$3.00	per measure

Kit Faucet Aerators (Bathroom)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
300550_2019_12_	School	Kit Faucet Aerator (Bathroom)	6.17	Water Heating RES	0.0000887318	0.06153283	0.000547	10.0	\$3.00	per measure
300560_2020_12_	ARP	Kit Faucet Aerator (Bathroom) - ARP Kits	2.65	Water Heating RES	0.0000887318	0.06153283	0.000235	10.0	\$3.00	per measure
300600_2019_12_	MF	Kit Faucet Aerator (Bathroom)	30.10	Water Heating RES	0.0000887318	0.06153283	0.002671	10.0	\$3.00	per measure
300601_2020_12_	IE	Kit Faucet Aerator (Bathroom) - SFLI Kits	13.84	Water Heating RES	0.0000887318	0.04658558	0.001228	10.0	\$3.00	per measure

RESIDENTIAL ENERGY EFFICIENCY KITS

Low Flow Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
300650_2019_12_	School	Low Flow Showerheads	71.66	Water Heating RES	0.0000887318	0.109	0.006359	10.0	\$7.00	per measure
300660_2020_12_	ARP	Low Flow Showerheads - ARP Kits	27.35	Water Heating RES	0.0000887318	0.109	0.002427	10.0	\$7.00	per measure
300700_2019_12_	MF	Low Flow Showerheads	291.45	Water Heating RES	0.0000887318	0.109	0.025861	10.0	\$7.00	per measure
300701_2021_12_	IE	Low Flow Showerheads - SFIE Kits	79.49	Water Heating RES	0.0000887318	0.109	0.007053	10.0	\$7.00	per measure

Pipe Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
300750_2019_12_	School	Pipe Insulation	3.24	Water Heating RES	0.0000887318	0.000287	12.0	\$2.87	per foot
300760_2020_12_	ARP	Pipe Insulation - ARP Kits	2.59	Water Heating RES	0.0000887318	0.000230	12.0	\$2.87	per foot
300800_2019_12_	MF	Pipe Insulation	15.01	Water Heating RES	0.0000887318	0.001332	12.0	\$2.87	per foot
300801_2020_12_	IE	Pipe Insulation - SFIE Kits	3.40	Water Heating RES	0.0000887318	0.000302	12.0	\$2.87	per foot

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
300850_2019_12_	Unknown	Advanced Tier 1 Power Strips -TOS/NC - Home Office	29.45	Miscellaneous RES	0.0001148238	0.003382	10.0	\$20.00	per measure
300851_2020_12_	Unknown	Advanced Tier 1 Power Strips -DI - Home Office	29.45	Miscellaneous RES	0.0001148238	0.003382	10.0	\$30.00	per measure
300900_2019_12_	Unknown	Advanced Tier 1 Power Strips -Kits - Home Office	29.08	Miscellaneous RES	0.0001148238	0.003339	10.0	\$20.00	per measure
300950_2019_12_	Unknown	Advanced Tier 1 Power Strips -TOS/NC - Home Entertainment	71.35	Miscellaneous RES	0.0001148238	0.008193	10.0	\$20.00	per measure
300951_2020_12_	Unknown	Advanced Tier 1 Power Strips -DI - Home Entertainment	71.35	Miscellaneous RES	0.0001148238	0.008193	10.0	\$30.00	per measure
301000_2019_12_	Unknown	Advanced Tier 1 Power Strips -Kits - Home Entertainment	70.44	Miscellaneous RES	0.0001148238	0.008088	10.0	\$20.00	per measure
301050_2019_12_	Unknown	Advanced Tier 1 Power Strips -TOS/NC - Unknown Location	56.26	Miscellaneous RES	0.0001148238	0.006460	10.0	\$20.00	per measure
301051_2020_12_	Unknown	Advanced Tier 1 Power Strips -DI - Unknown Location	56.26	Miscellaneous RES	0.0001148238	0.006460	10.0	\$30.00	per measure
301100_2019_12_	Unknown	Advanced Tier 1 Power Strips -Kits - Unknown Location	50.59	Miscellaneous RES	0.0001148238	0.005809	10.0	\$20.00	per measure

Advanced Power Strips Tier 2 / Advanced Control Strategies

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
301149_2021_12_	Unknown	Advanced Tier 2 Power Strips - TOS/NC/DI - Unknown Location	153.90	Miscellaneous RES	0.0001148238	0.017671	10.0	\$10.00	per measure
301150_2021_12_	IE	Advanced Tier 2 Power Strips - SFIE Kits - Unknown Location	151.96	Miscellaneous RES	0.0001148238	0.017449	10.0	\$30.00	per measure

*The actual full installation cost of the Tier 2 AV APS (including equipment and labor) should be used.

RESIDENTIAL HVAC

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
350050_2021_12	SF	ECM Auto Fan ROF-SF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	20.0	\$0.00	per measure
350100_2021_12	MF	ECM Auto Fan ROF-MF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	20.0	\$0.00	per measure
350150_2021_12	SF	ECM Auto Fan ER1 - SF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259000	6.0	\$86.21	per measure
350150_2021_12	SF	ECM Auto Fan ER2 - SF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	0.0	\$0.00	per measure
350175_2021_12	MF	ECM Auto Fan ER1 - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259000	6.0	\$86.21	per measure
350175_2021_12	MF	ECM Auto Fan ER2 - MF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	0.0	\$0.00	per measure
350200_2021_12	SF	ECM Continuous Fan ROF-SF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	20.0	\$0.00	per measure
350250_2021_12	MF	ECM Continuous Fan ROF-MF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	20.0	\$0.00	per measure
350300_2021_12	SF	ECM Continuous Fan ER1 - SF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259000	6.0	\$86.21	per measure
350300_2021_12	SF	ECM Continuous Fan ER2 - SF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	0.0	\$0.00	per measure
350350_2021_12	MF	ECM Continuous Fan ER1 - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259000	6.0	\$86.21	per measure
350350_2021_12	MF	ECM Continuous Fan ER2 - MF	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000000	0.0	\$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(y)). 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).

Central Air Conditioners

*MfC = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
350400_2023_12	SF	CAC-SEER14_ER1_SF	1,507.85	Cooling RES	0.0009474181	1.428564	6	\$515.09	2.98
350400_2023_12	SF	CAC-SEER14_ER2_SF	0.00	Cooling RES ER2	0.0009474181	0.000000	12	\$0.00	2.98
350450_2023_12	SF	CAC-SEER14_ROF_SF	0.00	Cooling RES	0.0009474181	0.000000	18	\$0.00	2.97
350500_2023_12	MF	CAC-SEER14_ER1_MF	1,011.98	Cooling RES	0.0009474181	0.958768	6	\$442.08	2.00
350500_2023_12	MF	CAC-SEER14_ER2_MF	0.00	Cooling RES ER2	0.0009474181	0.000000	12	\$0.00	2.00
350501_2023_12	MfC	CAC-SEER14_ER1_MF_CompE	735.98	Cooling RES	0.0009474181	0.697281	6	\$345.70	2.00
350501_2023_12	MfC	CAC-SEER14_ER2_MF_CompE	0.00	Cooling RES ER2	0.0009474181	0.000000	12	\$0.00	2.00
350550_2023_12	MF	CAC-SEER14_ROF_MF	0.00	Cooling RES	0.0009474181	0.000000	18	\$0.00	2.00
350551_2023_12	MfC	CAC-SEER14_ROF_MF_CompE	0.00	Cooling RES	0.0009474181	0.000000	18	\$0.00	2.00
350600_2023_12	SF	CAC-SEER15_ER1_SF	2,107.99	Cooling RES	0.0009474181	1.997148	6	\$646.39	3.11
350600_2023_12	SF	CAC-SEER15_ER2_SF	169.64	Cooling RES ER2	0.0009474181	0.160720	12	\$0.00	3.11
350650_2023_12	SF	CAC-SEER15_ROF_SF	161.06	Cooling RES	0.0009474181	0.152591	18	\$108.00	2.95
350700_2023_12	MF	CAC-SEER15_ER1_MF	1,759.78	Cooling RES	0.0009474181	1.667247	6	\$530.52	2.44
350700_2023_12	MF	CAC-SEER15_ER2_MF	131.75	Cooling RES ER2	0.0009474181	0.124822	12	\$0.00	2.44
350701_2023_12	MfC	CAC-SEER15_ER1_MF_CompE	1,279.84	Cooling RES	0.0009474181	1.212544	6	\$530.52	2.44
350701_2023_12	MfC	CAC-SEER15_ER2_MF_CompE	95.82	Cooling RES ER2	0.0009474181	0.090782	12	\$8.00	2.44
350750_2023_12	MF	CAC-SEER15_ROF_MF	74.99	Cooling RES	0.0009474181	0.071047	18	\$108.00	1.51
350751_2023_12	MfC	CAC-SEER15_ROF_MF_CompE	54.54	Cooling RES	0.0009474181	0.051672	18	\$108.00	1.51
350800_2023_12	SF	CAC-SEER16_ER1_SF	2,134.78	Cooling RES	0.0009474181	2.022529	6	\$726.66	2.93
350800_2023_12	SF	CAC-SEER16_ER2_SF	275.66	Cooling RES ER2	0.0009474181	0.261165	12	\$0.00	2.93
350850_2023_12	SF	CAC-SEER16_ROF_SF	283.54	Cooling RES	0.0009474181	0.268631	18	\$221.00	3.00
350900_2023_12	MF	CAC-SEER16_ER1_MF	1,835.08	Cooling RES	0.0009474181	1.738588	6	\$657.24	2.52
350900_2023_12	MF	CAC-SEER16_ER2_MF	238.17	Cooling RES ER2	0.0009474181	0.225647	12	\$0.00	2.52
350901_2023_12	MfC	CAC-SEER16_ER1_MF_CompE	1,334.60	Cooling RES	0.0009474181	1.264424	6	\$657.24	2.52
350901_2023_12	MfC	CAC-SEER16_ER2_MF_CompE	173.22	Cooling RES ER2	0.0009474181	0.164112	12	\$0.00	2.52
350950_2023_12	MF	CAC-SEER16_ROF_MF	257.86	Cooling RES	0.0009474181	0.244301	18	\$221.00	2.75
350951_2023_12	MfC	CAC-SEER16_ROF_MF_CompE	187.53	Cooling RES	0.0009474181	0.177669	18	\$221.00	2.75
351000_2023_12	SF	CAC-SEER17_ER1_SF	2,272.74	Cooling RES	0.0009474181	2.153235	6	\$1,128.88	2.94
351000_2023_12	SF	CAC-SEER17_ER2_SF	394.29	Cooling RES ER2	0.0009474181	0.373557	12	\$0.00	2.94
351050_2023_12	SF	CAC-SEER17_ROF_SF	384.26	Cooling RES	0.0009474181	0.364055	18	\$620.00	2.88
351100_2023_12	MF	CAC-SEER17_ER1_MF	1,936.61	Cooling RES	0.0009474181	1.834779	6	\$1,034.84	2.40
351100_2023_12	MF	CAC-SEER17_ER2_MF	327.41	Cooling RES ER2	0.0009474181	0.310194	12	\$0.00	2.40
351101_2023_12	MfC	CAC-SEER17_ER1_MF_CompE	1,408.44	Cooling RES	0.0009474181	1.334382	6	\$1,034.84	2.40
351101_2023_12	MfC	CAC-SEER17_ER2_MF_CompE	238.11	Cooling RES ER2	0.0009474181	0.225590	12	\$0.00	2.40
351150_2023_12	MF	CAC-SEER17_ROF_MF	360.75	Cooling RES	0.0009474181	0.341781	18	\$620.00	2.75
351151_2023_12	MfC	CAC-SEER17_ROF_MF_CompE	262.36	Cooling RES	0.0009474181	0.248565	18	\$620.00	2.75

RESIDENTIAL HVAC

Central Air Conditioners

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351160_2023_12	SF	CAC-SEER18_ER1_SF	2,517.94	Cooling RES	0.0009474181	2.385542	6	\$1,402.78	3.33
351160_2023_12	SF	CAC-SEER18_ER2_SF	551.22	Cooling RES ER2	0.0009474181	0.522236	12	\$0.00	3.33
351161_2023_12	SF	CAC-SEER18_ROF_SF	561.19	Cooling RES	0.0009474181	0.531682	18	\$826.67	3.40
351162_2023_12	MF	CAC-SEER18_ER1_MF	2,128.65	Cooling RES	0.0009474181	2.016722	6	\$1,379.27	2.50
351162_2023_12	MF	CAC-SEER18_ER2_MF	412.98	Cooling RES ER2	0.0009474181	0.391265	12	\$0.00	2.50
351163_2023_12	MFc	CAC-SEER18_ER1_MF_CompE	1,220.33	Cooling RES	0.0009474181	1.156163	6	\$1,258.79	2.50
351163_2023_12	MFc	CAC-SEER18_ER2_MF_CompE	300.35	Cooling RES ER2	0.0009474181	0.284557	12	\$0.00	2.50
351164_2023_12	MF	CAC-SEER18_ROF_MF	330.39	Cooling RES	0.0009474181	0.313017	18	\$826.67	2.00
351165_2023_12	MFc	CAC-SEER18_ROF_MF_CompE	240.28	Cooling RES	0.0009474181	0.227646	18	\$826.67	2.00
351170_2023_12	SF	CAC-SEER19_ER1_SF	3,468.74	Cooling RES	0.0009474181	3.286347	6	\$1,777.12	4.30
351170_2023_12	SF	CAC-SEER19_ER2_SF	858.80	Cooling RES ER2	0.0009474181	0.813643	12	\$0.00	4.30
351171_2023_12	SF	CAC-SEER19_ROF_SF	852.72	Cooling RES	0.0009474181	0.807882	18	\$1,033.33	4.24
351172_2023_12	MF	CAC-SEER19_ER1_MF	1,403.23	Cooling RES	0.0009474181	1.329446	6	\$1,379.03	2.00
351172_2023_12	MF	CAC-SEER19_ER2_MF	391.25	Cooling RES ER2	0.0009474181	0.370677	12	\$0.00	2.00
351173_2023_12	MFc	CAC-SEER19_ER1_MF_CompE	1,020.53	Cooling RES	0.0009474181	0.966869	6	\$1,379.03	2.00
351173_2023_12	MFc	CAC-SEER19_ER2_MF_CompE	284.54	Cooling RES ER2	0.0009474181	0.269578	12	\$0.00	2.00
351174_2023_12	MF	CAC-SEER19_ROF_MF	391.25	Cooling RES	0.0009474181	0.370677	18	\$1,033.33	2.00
351175_2023_12	MFc	CAC-SEER19_ROF_MF_CompE	284.54	Cooling RES	0.0009474181	0.269578	18	\$1,033.33	2.00
351180_2023_12	SF	CAC-SEER20_ER1_SF	2,749.75	Cooling RES	0.0009474181	2.605163	6	\$1,825.08	3.38
351180_2023_12	SF	CAC-SEER20_ER2_SF	764.57	Cooling RES ER2	0.0009474181	0.724367	12	\$0.00	3.38
351181_2023_12	SF	CAC-SEER20_ROF_SF	662.85	Cooling RES	0.0009474181	0.627996	18	\$1,240.00	2.97
351182_2023_12	MF	CAC-SEER20_ER1_MF	1,436.44	Cooling RES	0.0009474181	1.360909	6	\$1,585.70	2.00
351182_2023_12	MF	CAC-SEER20_ER2_MF	446.02	Cooling RES ER2	0.0009474181	0.422567	12	\$0.00	2.00
351183_2023_12	MFc	CAC-SEER20_ER1_MF_CompE	1,060.36	Cooling RES	0.0009474181	1.004604	6	\$1,585.70	2.00
351183_2023_12	MFc	CAC-SEER20_ER2_MF_CompE	324.38	Cooling RES ER2	0.0009474181	0.307323	12	\$0.00	2.00
351184_2023_12	MF	CAC-SEER20_ROF_MF	446.02	Cooling RES	0.0009474181	0.422567	18	\$1,240.00	2.00
351185_2023_12	MFc	CAC-SEER20_ROF_MF_CompE	324.38	Cooling RES	0.0009474181	0.307323	18	\$1,240.00	2.00
351190_2023_12	SF	CAC-SEER21+_ER1_SF	2,671.22	Cooling RES	0.0009474181	2.530762	6	\$2,003.71	3.22
351190_2023_12	SF	CAC-SEER21+_ER2_SF	880.23	Cooling RES ER2	0.0009474181	0.833946	12	\$0.00	3.22
351191_2023_12	SF	CAC-SEER21+_ROF_SF	990.06	Cooling RES	0.0009474181	0.938001	18	\$1,446.67	3.50
351192_2023_12	MF	CAC-SEER21+_ER1_MF	1,507.56	Cooling RES	0.0009474181	1.428290	6	\$1,792.36	2.00
351192_2023_12	MF	CAC-SEER21+_ER2_MF	495.58	Cooling RES ER2	0.0009474181	0.469521	12	\$0.00	2.00
351193_2023_12	MFc	CAC-SEER21+_ER1_MF_CompE	1,096.41	Cooling RES	0.0009474181	1.038759	6	\$1,792.36	2.00
351193_2023_12	MFc	CAC-SEER21+_ER2_MF_CompE	360.42	Cooling RES ER2	0.0009474181	0.341468	12	\$0.00	2.00
351194_2023_12	MF	CAC-SEER21+_ROF_MF	495.58	Cooling RES	0.0009474181	0.469521	18	\$1,446.67	2.00
351195_2023_12	MFc	CAC-SEER21+_ROF_MF_CompE	360.42	Cooling RES	0.0009474181	0.341468	18	\$1,446.67	2.00

*Incremental cost to be adjusted based on cost testing used

Mini/Multi-Split Heat Pumps and Air Conditioners

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351200_2023_12	SF	Mini/MultiSplitAC_ER1_SF	1,227.25	Cooling RES	0.0009474181	1.162719	6.0	\$1,449.70	1.75
351200_2023_12	SF	Mini/MultiSplitAC_ER2_SF	280.15	Cooling RES ER2	0.0009474181	0.265419	12.0	\$0.00	
351250_2023_12	SF	Mini/MultiSplitAC_ROF_SF	214.55	Cooling RES	0.0009474181	0.203269	18.0	\$364.64	1.06
351300_2023_12	SF	Mini/MultiSplitASHP_ROF_SF_NC	242.16	Cooling RES	0.0009474181	0.229427	18.0	\$364.64	1.47
351300_2023_12	SF	Mini/MultiSplitASHP_ROF_SF_NC	572.32	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351350_2023_12	SF	Mini/MultiSplitASHP_ROF_SF	242.16	Cooling RES	0.0009474181	0.229427	18.0	\$364.64	1.47
351350_2023_12	SF	Mini/MultiSplitASHP_ROF_SF	572.32	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351400_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF	971.64	Cooling RES	0.0009474181	0.920549	6.0	\$2,505.19	1.55
351400_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF	4,740.51	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351400_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_SF	308.55	Cooling RES ER2	0.0009474181	0.292326	12.0	\$0.00	
351400_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_SF	4,740.51	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351401_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF	971.64	Cooling RES	0.0009474181	0.920549	6.0	\$2,505.19	1.55
351401_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351401_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_SF	308.55	Cooling RES ER2	0.0009474181	0.292326	12.0	\$0.00	
351401_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351450_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF	295.52	Cooling RES	0.0009474181	0.279981	18.0	\$364.64	1.47
351450_2023_12	SF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF	4,143.51	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351451_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF	295.52	Cooling RES	0.0009474181	0.279981	18.0	\$364.64	1.47
351451_2022_12	SF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351500_2023_12	SF	Mini/MultiSplitASHP_ER1_SF	971.64	Cooling RES	0.0009474181	0.920549	6.0	\$795.09	1.55
351500_2023_12	SF	Mini/MultiSplitASHP_ER1_SF	2,197.56	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351500_2023_12	SF	Mini/MultiSplitASHP_ER2_SF	252.31	Cooling RES ER2	0.0009474181	0.239043	12.0	\$0.00	
351500_2023_12	SF	Mini/MultiSplitASHP_ER2_SF	1,456.32	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Mini/Multi-Split Heat Pumps and Air Conditioners

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351550_2023_12	MF	Mini/MultiSplitAC_ER1_MF	1,402.57	Cooling RES	0.0009474181	1.328820	6.0	\$1,604.71	1.75
351550_2023_12	MF	Mini/MultiSplitAC_ER2_MF	320.17	Cooling RES ER2	0.0009474181	0.303335	12.0	\$0.00	
351551_2023_12	Mfc	Mini/MultiSplitAC_ER1_MF_CompE	937.47	Cooling RES	0.0009474181	0.888176	6.0	\$1,604.71	2.00
351551_2023_12	Mfc	Mini/MultiSplitAC_ER2_MF_CompE	226.66	Cooling RES ER2	0.0009474181	0.214742	12.0	\$0.00	
351600_2023_12	MF	Mini/MultiSplitAC_ROF_MF	406.52	Cooling RES	0.0009474181	0.385144	18.0	\$364.64	1.06
351601_2021_12	Mfc	Mini/MultiSplitAC_ROF_MF_CompE	1,100.38	Cooling RES	0.0009474181	1.042520	18.0	\$364.64	2.00
351650_2023_12	MF	Mini/MultiSplitASHP_ROF_MF_NC	163.83	Cooling RES	0.0009474181	0.155216	18.0	\$364.64	1.47
351650_2023_12	MF	Mini/MultiSplitASHP_ROF_MF_NC	369.67	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351651_2023_12	Mfc	Mini/MultiSplitASHP_ROF_MF_NC_CompE	107.58	Cooling RES	0.0009474181	0.101923	18.0	\$364.64	1.01
351651_2023_12	Mfc	Mini/MultiSplitASHP_ROF_MF_NC_CompE	140.50	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351700_2023_12	MF	Mini/MultiSplitASHP_ROF_MF	163.83	Cooling RES	0.0009474181	0.155216	18.0	\$364.64	1.47
351700_2023_12	MF	Mini/MultiSplitASHP_ROF_MF	369.67	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351701_2023_12	Mfc	Mini/MultiSplitASHP_ROF_MF_CompE	107.58	Cooling RES	0.0009474181	0.101923	18.0	\$364.64	1.01
351701_2023_12	Mfc	Mini/MultiSplitASHP_ROF_MF_CompE	140.50	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351750_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF	1,200.76	Cooling RES	0.0009474181	1.137622	6.0	\$3,126.64	2.00
351750_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF	5,287.87	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351750_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_MF	345.16	Cooling RES ER2	0.0009474181	0.327011	12.0	\$0.00	
351750_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_MF	5,287.87	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351751_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF_CompE	788.53	Cooling RES	0.0009474181	0.747068	6.0	\$3,126.64	2.00
351751_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF_CompE	2,009.80	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351751_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_MF_CompE	226.66	Cooling RES ER2	0.0009474181	0.214742	12.0	\$0.00	
351751_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER2_MF_CompE	2,009.80	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351752_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF	1,093.24	Cooling RES	0.0009474181	1.035755	6.0	\$3,126.64	2.00
351752_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351752_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_MF	345.16	Cooling RES ER2	0.0009474181	0.327011	12.0	\$0.00	
351752_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_MF	0.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351753_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF_CompE	788.53	Cooling RES	0.0009474181	0.747068	6.0	\$3,126.64	2.00
351753_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351753_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_MF_CompE	226.66	Cooling RES ER2	0.0009474181	0.214742	12.0	\$0.00	
351753_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351800_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF	200.36	Cooling RES	0.0009474181	0.189825	18.0	\$364.64	1.01
351800_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF	3,872.08	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351801_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF_CompE	131.58	Cooling RES	0.0009474181	0.124661	18.0	\$364.64	1.01
351801_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF_CompE	1,808.12	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351802_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF	200.36	Cooling RES	0.0009474181	0.189825	18.0	\$364.64	1.01
351802_2023_12	MF	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351803_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF_CompE	131.58	Cooling RES	0.0009474181	0.124661	18.0	\$364.64	1.01
351803_2023_12	Mfc	Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351850_2023_12	MF	Mini/MultiSplitASHP_ER1_MF	1,200.76	Cooling RES	0.0009474181	1.137622	6.0	\$920.06	2.00
351850_2023_12	MF	Mini/MultiSplitASHP_ER1_MF	2,576.48	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351850_2023_12	MF	Mini/MultiSplitASHP_ER2_MF	272.59	Cooling RES ER2	0.0009474181	0.258257	12.0	\$0.00	
351850_2023_12	MF	Mini/MultiSplitASHP_ER2_MF	1,456.32	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351851_2023_12	Mfc	Mini/MultiSplitASHP_ER1_MF_CompE	788.53	Cooling RES	0.0009474181	0.747068	6.0	\$920.06	2.00
351851_2023_12	Mfc	Mini/MultiSplitASHP_ER1_MF_CompE	979.26	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351851_2023_12	Mfc	Mini/MultiSplitASHP_ER2_MF_CompE	179.00	Cooling RES ER2	0.0009474181	0.169588	12.0	\$0.00	
351851_2023_12	Mfc	Mini/MultiSplitASHP_ER2_MF_CompE	678.87	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	

Dual Fuel Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
351900_2023_12	MF	DFHP-SEER19-ROF_MF	323.45	Cooling Res	0.0009474181	0.306442	18.0	\$2,936.60	3.4
351900_2023_12	MF	DFHP-SEER19-ROF_MF	483.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351901_2023_12	Mfc	DFHP-SEER19-ROF_MF_CompE	235.24	Cooling Res	0.0009474181	0.222871	18.0	\$2,936.60	3.4
351901_2023_12	Mfc	DFHP-SEER19-ROF_MF_CompE	220.18	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351950_2023_12	MF	DFHP-SEER20-ROF_MF	497.07	Cooling Res	0.0009474181	0.470933	18.0	\$3,176.60	4.4
351950_2023_12	MF	DFHP-SEER20-ROF_MF	772.89	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351951_2023_12	Mfc	DFHP-SEER20-ROF_MF_CompE	361.50	Cooling Res	0.0009474181	0.342492	18.0	\$3,176.60	4.4
351951_2023_12	Mfc	DFHP-SEER20-ROF_MF_CompE	352.26	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352000_2023_12	MF	DFHP-SEER21-ROF_MF	697.19	Cooling Res	0.0009474181	0.660530	18.0	\$3,626.60	5.4
352000_2023_12	MF	DFHP-SEER21-ROF_MF	1,116.40	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352001_2023_12	Mfc	DFHP-SEER21-ROF_MF_CompE	507.04	Cooling Res	0.0009474181	0.480379	18.0	\$3,626.60	5.4
352001_2023_12	Mfc	DFHP-SEER21-ROF_MF_CompE	508.81	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

RESIDENTIAL HVAC

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_2023_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF	1,603.02	Cooling Res	0.0009474181	1.518730	18.0	\$4,717.00	4.20
352050_2021_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF	16,223.39	Heating RES	0.0000000000	0.000000	18.0		
352100_2021_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF	4,933.84	Cooling Res	0.0009474181	4.674409	6.0	\$5,250.00	3.87
352100_2021_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF	15,784.45	Heating RES	0.0000000000	0.000000	6.0		
352100_2021_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ER2_SF	1,431.53	Cooling Res ER2	0.0009474181	1.356257	12.0		
352100_2021_12	SF	GSHP-EER23-Replace_CAC_ElectricHeat_ER2_SF	15,784.45	Heating RES ER2	0.0000000000	0.000000	12.0		
352200_2021_12	SF	GSHP-EER23_ER1_SF	3,557.73	Cooling Res	0.0009474181	3.370658	6.0	\$4,859.00	3.87
352200_2021_12	SF	GSHP-EER23_ER1_SF	2,686.03	Heating RES	0.0000000000	0.000000	6.0		
352200_2021_12	SF	GSHP-EER23_ER2_SF	1,431.53	Cooling Res ER2	0.0009474181	1.356257	12.0		
352200_2021_12	SF	GSHP-EER23_ER2_SF	1,977.83	Heating RES ER2	0.0000000000	0.000000	12.0		
352250_2023_12	SF	GSHP-EER23_ROF_SF	1,603.02	Cooling Res	0.0009474181	1.518730	18.0	\$3,200.00	4.20
352250_2021_12	SF	GSHP-EER23_ROF_SF	2,032.83	Heating RES	0.0000000000	0.000000	18.0		

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
352300_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$1,004.86	2.6
352300_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF	8,299.22	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352300_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_SF	166.32	Cooling Res ER2	0.0009474181	0.157575	12.0	\$0.00	
352300_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_SF	8,299.22	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352310_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$1,004.86	2.6
352310_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352310_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_SF	166.32	Cooling Res ER2	0.0009474181	0.157575	12.0	\$0.00	
352310_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352350_2023_12	SF	ASHP-SEER15_ER1_SF	2,004.34	Cooling Res	0.0009474181	1.898948	6.0	\$1,004.86	2.6
352350_2023_12	SF	ASHP-SEER15_ER1_SF	1,774.34	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352350_2023_12	SF	ASHP-SEER15_ER2_SF	17.43	Cooling Res ER2	0.0009474181	0.016513	12.0	\$0.00	
352350_2023_12	SF	ASHP-SEER15_ER2_SF	125.72	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352400_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF	171.42	Cooling Res	0.0009474181	0.162406	18.0	\$303.00	2.8
352400_2023_12	SF	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF	8,958.99	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352410_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF	171.42	Cooling Res	0.0009474181	0.162406	18.0	\$303.00	2.8
352410_2023_12	SF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352450_2023_12	SF	ASHP-SEER15_ROF_SF	19.19	Cooling Res	0.0009474181	0.018181	18.0	\$303.00	2.8
352450_2023_12	SF	ASHP-SEER15_ROF_SF	44.14	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352500_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF	2,031.51	Cooling Res	0.0009474181	1.924689	6.0	\$1,128.50	2.5
352500_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF	8,346.27	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352500_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_SF	280.11	Cooling Res ER2	0.0009474181	0.265381	12.0	\$0.00	
352500_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_SF	8,346.27	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352510_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF	2,031.51	Cooling Res	0.0009474181	1.924689	6.0	\$1,128.50	2.5
352510_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352510_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_SF	280.11	Cooling Res ER2	0.0009474181	0.265381	12.0	\$0.00	
352510_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352550_2023_12	SF	ASHP-SEER16_ER1_SF	2,031.51	Cooling Res	0.0009474181	1.924689	6.0	\$1,128.50	2.5
352550_2023_12	SF	ASHP-SEER16_ER1_SF	1,926.94	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352550_2023_12	SF	ASHP-SEER16_ER2_SF	133.91	Cooling Res ER2	0.0009474181	0.126869	12.0	\$0.00	
352550_2023_12	SF	ASHP-SEER16_ER2_SF	305.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352600_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF	292.10	Cooling Res	0.0009474181	0.276741	18.0	\$438.00	2.8
352600_2023_12	SF	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF	9,173.07	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352610_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF	292.10	Cooling Res	0.0009474181	0.276741	18.0	\$438.00	3.0
352610_2023_12	SF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352650_2023_12	SF	ASHP-SEER16_ROF_SF	139.45	Cooling Res	0.0009474181	0.132117	18.0	\$438.00	2.8
352650_2023_12	SF	ASHP-SEER16_ROF_SF	244.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352700_2023_12	MF	ASHP-SEER15_ER1_MF	2,374.39	Cooling Res	0.0009474181	2.249540	6.0	\$1,114.17	3.0
352700_2023_12	MF	ASHP-SEER15_ER1_MF	2,372.56	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352700_2023_12	MF	ASHP-SEER15_ER2_MF	7.62	Cooling Res ER2	0.0009474181	0.007219	12.0	\$0.00	
352700_2023_12	MF	ASHP-SEER15_ER2_MF	467.17	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352701_2023_12	Mfc	ASHP-SEER15_ER1_MF_CompE	1,726.83	Cooling Res	0.0009474181	1.636030	6.0	\$1,114.17	3.0
352701_2023_12	Mfc	ASHP-SEER15_ER1_MF_CompE	808.83	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352701_2023_12	Mfc	ASHP-SEER15_ER2_MF_CompE	5.54	Cooling Res ER2	0.0009474181	0.005249	12.0	\$0.00	
352701_2023_12	Mfc	ASHP-SEER15_ER2_MF_CompE	159.26	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
352750_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF	2,374.4	Cooling Res	0.0009474181	2.249540	6.0	\$1,114.17	3.0
352750_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF	9,913.7	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352750_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_MF	171.5	Cooling Res ER2	0.0009474181	0.162473	12.0	\$0.00	
352750_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_MF	9,913.7	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352751_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,726.8	Cooling Res	0.0009474181	1.636030	6.0	\$1,114.17	3.0
352751_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF_CompE	3,379.7	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352751_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_MF_CompE	124.7	Cooling Res ER2	0.0009474181	0.118162	12.0	\$0.00	
352751_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ER2_MF_CompE	3,379.7	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352760_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF	2,374.4	Cooling Res	0.0009474181	2.249540	6.0	\$1,114.17	3.0
352760_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF	0.0	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352760_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_MF	171.5	Cooling Res ER2	0.0009474181	0.162473	12.0	\$0.00	
352760_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_MF	0.0	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352761_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF_CompE	1,726.8	Cooling Res	0.0009474181	1.636030	6.0	\$1,114.17	3.0
352761_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.0	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352761_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_MF_CompE	124.7	Cooling Res ER2	0.0009474181	0.118162	12.0	\$0.00	
352761_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.0	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352800_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF	124.1	Cooling Res	0.0009474181	0.117612	18.0	\$303.00	2.2
352800_2023_12	MF	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF	6,883.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352801_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF_CompE	90.3	Cooling Res	0.0009474181	0.085542	18.0	\$303.00	2.2
352801_2023_12	Mfc	ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,346.5	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352810_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF	124.1	Cooling Res	0.0009474181	0.117612	18.0	\$303.00	2.2
352810_2023_12	MF	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352811_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF_CompE	90.3	Cooling Res	0.0009474181	0.085542	18.0	\$303.00	2.2
352811_2023_12	Mfc	ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352850_2023_12	MF	ASHP-SEER16_ER1_MF	2,088.3	Cooling Res	0.0009474181	1.978484	6.0	\$1,212.49	2.8
352850_2023_12	MF	ASHP-SEER16_ER1_MF	2,245.6	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352850_2023_12	MF	ASHP-SEER16_ER2_MF	137.6	Cooling Res ER2	0.0009474181	0.130355	12.0	\$0.00	
352850_2023_12	MF	ASHP-SEER16_ER2_MF	426.3	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352851_2023_12	Mfc	ASHP-SEER16_ER1_MF_CompE	1,518.8	Cooling Res	0.0009474181	1.438891	6.0	\$1,212.49	2.8
352851_2023_12	Mfc	ASHP-SEER16_ER1_MF_CompE	765.5	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352851_2023_12	Mfc	ASHP-SEER16_ER2_MF_CompE	100.1	Cooling Res ER2	0.0009474181	0.094808	12.0	\$0.00	
352851_2023_12	Mfc	ASHP-SEER16_ER2_MF_CompE	145.3	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352900_2023_12	MF	ASHP-SEER16_ROF_MF	97.8	Cooling Res	0.0009474181	0.092620	18.0	\$438.00	2.2
352900_2023_12	MF	ASHP-SEER16_ROF_MF	207.2	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352901_2023_12	Mfc	ASHP-SEER16_ROF_MF_CompE	71.1	Cooling Res	0.0009474181	0.067361	18.0	\$438.00	2.2
352901_2023_12	Mfc	ASHP-SEER16_ROF_MF_CompE	70.6	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352950_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF	209.5	Cooling Res	0.0009474181	0.198475	18.0	\$438.00	2.2
352950_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF	7,302.7	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352951_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF_CompE	152.4	Cooling Res	0.0009474181	0.144349	18.0	\$438.00	2.2
352951_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,489.5	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352960_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF	209.5	Cooling Res	0.0009474181	0.198475	18.0	\$438.00	2.2
352960_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352961_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF_CompE	152.4	Cooling Res	0.0009474181	0.144349	18.0	\$438.00	2.2
352961_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353000_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF	2,088.3	Cooling Res	0.0009474181	1.978484	6.0	\$1,212.49	2.8
353000_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF	9,445.7	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353000_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF	294.8	Cooling Res ER2	0.0009474181	0.279337	12.0	\$0.00	
353000_2023_12	MF	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF	9,445.7	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353001_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,518.8	Cooling Res	0.0009474181	1.438891	6.0	\$1,212.49	2.8
353001_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF_CompE	3,220.1	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353001_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF_CompE	214.4	Cooling Res ER2	0.0009474181	0.203155	12.0	\$0.00	
353001_2023_12	Mfc	ASHP-SEER16-Replace_CAC_ElectricHeat_ER2_MF_CompE	3,220.1	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353010_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF	2,088.3	Cooling Res	0.0009474181	1.978484	6.0	\$1,212.49	2.8
353010_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF	0.0	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353010_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_MF	294.8	Cooling Res ER2	0.0009474181	0.279337	12.0	\$0.00	
353010_2023_12	MF	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_MF	0.0	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353011_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF_CompE	1,518.8	Cooling Res	0.0009474181	1.438891	6.0	\$1,212.49	2.8
353011_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.0	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353011_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_MF_CompE	214.4	Cooling Res ER2	0.0009474181	0.203155	12.0	\$0.00	
353011_2023_12	Mfc	ASHP-SEER16-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.0	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353050_2023_12	MF	ASHP-SEER15_ROF_MF	97.8	Cooling Res	0.0009474181	0.000000	18.0	\$303.00	2.2
353050_2023_12	MF	ASHP-SEER15_ROF_MF	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353051_2023_12	Mfc	ASHP-SEER15_ROF_MF_CompE	0.0	Cooling Res	0.0009474181	0.000000	18.0	\$303.00	2.2
353051_2023_12	Mfc	ASHP-SEER15_ROF_MF_CompE	0.0	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
353100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF	424.08	Cooling Res	0.0009474181	0.401781	18.0	\$724.00	3.2
353100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF	10,794.65	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF	424.08	Cooling Res	0.0009474181	0.401781	18.0	\$724.00	3.2
353110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF	239.23	Cooling Res	0.0009474181	0.226651	18.0	\$724.00	2.8
353150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353151_2023_12	MFc	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF_CompE	173.99	Cooling Res	0.0009474181	0.164841	18.0	\$724.00	2.8
353151_2023_12	MFc	ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF	239.23	Cooling Res	0.0009474181	0.226651	18.0	\$724.00	2.8
353160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF_CompE	173.99	Cooling Res	0.0009474181	0.164841	18.0	\$724.00	2.8
353161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353200_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF	496.20	Cooling Res	0.0009474181	0.470109	18.0	\$962.92	3.0
353200_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF	10,358.22	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353210_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF	496.20	Cooling Res	0.0009474181	0.470109	18.0	\$962.92	3.0
353210_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353250_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF	496.57	Cooling Res	0.0009474181	0.470459	18.0	\$962.92	3.0
353250_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF	10,124.50	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353251_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF_CompE	361.14	Cooling Res	0.0009474181	0.342151	18.0	\$962.92	3.0
353251_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF_CompE	3,451.53	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353260_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF	496.57	Cooling Res	0.0009474181	0.470459	18.0	\$962.92	3.0
353260_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353261_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF_CompE	361.14	Cooling Res	0.0009474181	0.342151	18.0	\$962.92	3.0
353261_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353300_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF	699.07	Cooling Res	0.0009474181	0.662312	18.0	\$1,203.65	3.0
353300_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF	10,441.58	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353310_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	699.07	Cooling Res	0.0009474181	0.662312	18.0	\$1,203.65	3.0
353310_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353350_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF	382.36	Cooling Res	0.0009474181	0.362255	18.0	\$1,203.65	2.8
353350_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353351_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF_CompE	259.45	Cooling Res	0.0009474181	0.245808	18.0	\$1,203.65	2.8
353351_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353360_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_MF	382.36	Cooling Res	0.0009474181	0.362255	18.0	\$1,203.65	2.8
353360_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353361_2023_12	MFc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_MF_CompE	259.45	Cooling Res	0.0009474181	0.245808	18.0	\$1,203.65	2.8
353361_2023_12	MFc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353400_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	2,567.77	Cooling Res	0.0009474181	2.432752	6.0	\$2,149.16	2.6
353400_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	9,124.58	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353400_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_SF	717.86	Cooling Res ER2	0.0009474181	0.680114	12.0	\$0.00	
353400_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_SF	9,124.58	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353410_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	2,567.77	Cooling Res	0.0009474181	2.432752	6.0	\$2,149.16	2.6
353410_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353410_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_SF	717.86	Cooling Res ER2	0.0009474181	0.680114	12.0	\$0.00	
353410_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353450_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	717.64	Cooling Res	0.0009474181	0.679905	18.0	\$1,444.38	2.9
353450_2023_12	SF	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	10,212.26	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353460_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	717.64	Cooling Res	0.0009474181	0.679905	18.0	\$1,444.38	2.9
353460_2023_12	SF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353500_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF	464.79	Cooling Res	0.0009474181	0.440350	18.0	\$1,444.38	3.2
353500_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF	7,100.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353501_2023_12	MFc	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF_CompE	338.03	Cooling Res	0.0009474181	0.320256	18.0	\$1,444.38	3.2
353501_2023_12	MFc	ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,420.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353510_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF	464.79	Cooling Res	0.0009474181	0.440350	18.0	\$1,444.38	3.2
353510_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353511_2023_12	MFc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF_CompE	338.03	Cooling Res	0.0009474181	0.320256	18.0	\$1,444.38	3.2
353511_2023_12	MFc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353550_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	2,702.24	Cooling Res	0.0009474181	2.560151	6.0	\$2,602.23	3.3
353550_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	12,022.15	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353550_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_SF	892.64	Cooling Res ER2	0.0009474181	0.845703	12.0	\$0.00	
353550_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_SF	12,022.15	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353560_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	2,702.24	Cooling Res	0.0009474181	2.560151	6.0	\$2,602.23	3.3
353560_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353560_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_SF	892.64	Cooling Res ER2	0.0009474181	0.845703	12.0	\$0.00	
353560_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
353600_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	1,521.91	Cooling Res	0.0009474181	1.441885	6.0	\$2,239.65	3.1
353600_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353600_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF	500.30	Cooling Res ER2	0.0009474181	0.473993	12.0	\$0.00	
353600_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353601_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,106.84	Cooling Res	0.0009474181	1.048640	6.0	\$2,239.65	3.1
353601_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF_CompE	2,304.47	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353601_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF_CompE	363.85	Cooling Res ER2	0.0009474181	0.344718	12.0	\$0.00	
353601_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ER2_MF_CompE	2,304.47	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353610_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF	1,521.91	Cooling Res	0.0009474181	1.441885	6.0	\$2,239.65	3.1
353610_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353610_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_MF	500.30	Cooling Res ER2	0.0009474181	0.473993	12.0	\$0.00	
353610_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_MF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353611_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF_CompE	1,106.84	Cooling Res	0.0009474181	1.048640	6.0	\$2,239.65	3.1
353611_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353611_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_MF_CompE	363.85	Cooling Res ER2	0.0009474181	0.344718	12.0	\$0.00	
353611_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353650_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	999.42	Cooling Res	0.0009474181	0.946869	18.0	\$1,689.92	3.5
353650_2023_12	SF	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	12,395.99	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353660_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	999.42	Cooling Res	0.0009474181	0.946869	18.0	\$1,689.92	3.5
353660_2023_12	SF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353700_2023_12	MF	ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF	516.43	Cooling Res	0.0009474181	0.489275	18.0	\$1,689.92	3.2
353700_2023_12	MF	ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF	7,100.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353701_2023_12	Mfc	ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF_CompE	375.59	Cooling Res	0.0009474181	0.355841	18.0	\$1,689.92	3.2
353701_2023_12	Mfc	ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,420.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353710_2023_12	MF	ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF	516.43	Cooling Res	0.0009474181	0.489275	18.0	\$1,689.92	3.2
353710_2023_12	MF	ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353711_2023_12	Mfc	ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF_CompE	375.59	Cooling Res	0.0009474181	0.355841	18.0	\$1,689.92	3.2
353711_2023_12	Mfc	ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353750_2023_12	SF	ASHP-SEER17_ER1_SF	2,277.01	Cooling Res	0.0009474181	2.157280	6.0	\$1,449.79	2.7
353750_2023_12	SF	ASHP-SEER17_ER1_SF	2,214.40	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353750_2023_12	SF	ASHP-SEER17_ER2_SF	283.34	Cooling Res ER2	0.0009474181	0.268441	12.0	\$0.00	
353750_2023_12	SF	ASHP-SEER17_ER2_SF	509.57	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353800_2023_12	SF	ASHP-SEER17_ROF_SF	270.14	Cooling Res	0.0009474181	0.255936	18.0	\$724.00	3.2
353800_2023_12	SF	ASHP-SEER17_ROF_SF	589.90	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353850_2023_12	SF	ASHP-SEER18_ER1_SF	2,358.35	Cooling Res	0.0009474181	2.234343	6.0	\$1,751.94	2.9
353850_2023_12	SF	ASHP-SEER18_ER1_SF	2,716.07	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353850_2023_12	SF	ASHP-SEER18_ER2_SF	373.05	Cooling Res ER2	0.0009474181	0.353434	12.0	\$0.00	
353850_2023_12	SF	ASHP-SEER18_ER2_SF	862.73	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353950_2023_12	SF	ASHP-SEER18_ROF_SF	348.14	Cooling Res	0.0009474181	0.329834	18.0	\$962.92	3.0
353950_2023_12	SF	ASHP-SEER18_ROF_SF	820.53	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354000_2023_12	SF	ASHP-SEER19_ER1_SF	2,673.03	Cooling Res	0.0009474181	2.532477	6.0	\$2,233.01	3.8
354000_2023_12	SF	ASHP-SEER19_ER1_SF	3,575.55	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354000_2023_12	SF	ASHP-SEER19_ER2_SF	548.35	Cooling Res ER2	0.0009474181	0.519517	12.0	\$0.00	
354000_2023_12	SF	ASHP-SEER19_ER2_SF	1,157.63	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354050_2023_12	SF	ASHP-SEER19_ROF_SF	529.09	Cooling Res	0.0009474181	0.501269	18.0	\$1,203.65	3.0
354050_2023_12	SF	ASHP-SEER19_ROF_SF	935.67	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	2,277.01	Cooling Res	0.0009474181	2.157280	6.0	\$1,449.79	2.7
354100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	8,961.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_SF	438.15	Cooling Res ER2	0.0009474181	0.415111	12.0	\$0.00	
354100_2023_12	SF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_SF	8,961.76	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	2,277.01	Cooling Res	0.0009474181	2.157280	6.0	\$1,449.79	2.7
354110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_SF	438.15	Cooling Res ER2	0.0009474181	0.415111	12.0	\$0.00	
354110_2023_12	SF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	1,286.47	Cooling Res	0.0009474181	1.218825	6.0	\$1,273.72	3.1
354150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF	264.86	Cooling Res ER2	0.0009474181	0.250933	12.0	\$0.00	
354150_2023_12	MF	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354151_2023_12	Mfc	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF_CompE	935.62	Cooling Res	0.0009474181	0.886423	6.0	\$1,273.72	3.1
354151_2023_12	Mfc	ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF_CompE	2,304.47	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354151_2023_12	Mfc	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF_CompE	192.63	Cooling Res ER2	0.0009474181	0.182501	12.0	\$0.00	
354151_2023_12	Mfc	ASHP-SEER17-Replace_CAC_ElectricHeat_ER2_MF_CompE	2,304.47	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
354160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF	1,286.47	Cooling Res	0.0009474181	1.218825	6.0	\$1,273.72	3.1
354160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_MF	264.86	Cooling Res ER2	0.0009474181	0.250933	12.0	\$0.00	3.1
354160_2023_12	MF	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_MF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF_CompE	935.62	Cooling Res	0.0009474181	0.886423	6.0	\$1,273.72	3.1
354161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_MF_CompE	192.63	Cooling Res ER2	0.0009474181	0.182501	12.0	\$0.00	3.3
354161_2023_12	MFc	ASHP-SEER17-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354200_2023_12	MF	ASHP-SEER17_ER1_MF	1,369.47	Cooling Res	0.0009474181	1.297461	6.0	\$1,309.19	3.3
354200_2023_12	MF	ASHP-SEER17_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354200_2023_12	MF	ASHP-SEER17_ER2_MF	175.44	Cooling Res ER2	0.0009474181	0.166215	12.0	\$0.00	3.3
354200_2023_12	MF	ASHP-SEER17_ER2_MF	424.19	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354201_2023_12	MFc	ASHP-SEER17_ER1_MF_CompE	995.98	Cooling Res	0.0009474181	0.943609	6.0	\$1,309.19	3.3
354201_2023_12	MFc	ASHP-SEER17_ER1_MF_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354201_2023_12	MFc	ASHP-SEER17_ER2_MF_CompE	127.59	Cooling Res ER2	0.0009474181	0.120881	12.0	\$0.00	2.9
354201_2023_12	MFc	ASHP-SEER17_ER2_MF_CompE	144.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354250_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	2,358.35	Cooling Res	0.0009474181	2.234343	6.0	\$1,751.94	2.9
354250_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	10,051.22	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354250_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_SF	530.95	Cooling Res ER2	0.0009474181	0.503032	12.0	\$0.00	2.9
354250_2023_12	SF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_SF	10,051.22	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354260_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	2,358.35	Cooling Res	0.0009474181	2.234343	6.0	\$1,751.94	2.9
354260_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354260_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_SF	530.95	Cooling Res ER2	0.0009474181	0.503032	12.0	\$0.00	1.5
354260_2023_12	SF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354300_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	2,018.52	Cooling Res	0.0009474181	1.912382	6.0	\$1,372.14	1.5
354300_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	5,203.97	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354300_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF	248.29	Cooling Res ER2	0.0009474181	0.235234	12.0	\$0.00	1.5
354300_2023_12	MF	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF	5,203.97	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354301_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF_CompE	733.67	Cooling Res	0.0009474181	0.695092	6.0	\$1,372.14	1.5
354301_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,774.08	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354301_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF_CompE	180.57	Cooling Res ER2	0.0009474181	0.171075	12.0	\$0.00	1.5
354301_2023_12	MFc	ASHP-SEER18-Replace_CAC_ElectricHeat_ER2_MF_CompE	1,774.08	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354310_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF	2,018.52	Cooling Res	0.0009474181	1.912382	6.0	\$1,372.14	1.5
354310_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354310_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_MF	248.29	Cooling Res ER2	0.0009474181	0.235234	12.0	\$0.00	1.5
354310_2023_12	MF	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_MF	733.67	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354311_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF_CompE	733.67	Cooling Res	0.0009474181	0.695092	6.0	\$1,372.14	1.5
354311_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354311_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_MF_CompE	180.57	Cooling Res ER2	0.0009474181	0.171075	12.0	\$0.00	2.5
354311_2023_12	MFc	ASHP-SEER18-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354350_2023_12	MF	ASHP-SEER18_ER1_MF	2,464.77	Cooling Res	0.0009474181	2.335168	6.0	\$1,644.96	2.5
354350_2023_12	MF	ASHP-SEER18_ER1_MF	2,332.67	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354350_2023_12	MF	ASHP-SEER18_ER2_MF	289.67	Cooling Res ER2	0.0009474181	0.274439	12.0	\$0.00	2.5
354350_2023_12	MF	ASHP-SEER18_ER2_MF	730.60	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354351_2023_12	MFc	ASHP-SEER18_ER1_MF_CompE	1,792.56	Cooling Res	0.0009474181	1.698304	6.0	\$1,644.96	2.5
354351_2023_12	MFc	ASHP-SEER18_ER1_MF_CompE	795.23	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354351_2023_12	MFc	ASHP-SEER18_ER2_MF_CompE	210.67	Cooling Res ER2	0.0009474181	0.199593	12.0	\$0.00	3.8
354351_2023_12	MFc	ASHP-SEER18_ER2_MF_CompE	249.07	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354400_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	2,673.03	Cooling Res	0.0009474181	2.532477	6.0	\$2,233.01	3.8
354400_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	13,145.12	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354400_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_SF	727.55	Cooling Res ER2	0.0009474181	0.689294	12.0	\$0.00	3.6
354400_2023_12	SF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_SF	13,145.12	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354410_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	2,673.03	Cooling Res	0.0009474181	2.532477	6.0	\$2,185.78	3.6
354410_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354410_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_SF	727.55	Cooling Res ER2	0.0009474181	0.689294	12.0	\$0.00	3.1
354410_2023_12	SF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_SF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354450_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	1,416.58	Cooling Res	0.0009474181	1.342094	6.0	\$1,753.37	3.1
354450_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354450_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF	394.97	Cooling Res ER2	0.0009474181	0.374202	12.0	\$0.00	3.1
354450_2023_12	MF	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354451_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,030.24	Cooling Res	0.0009474181	0.976068	6.0	\$1,753.37	3.1
354451_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF_CompE	2,304.47	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354451_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF_CompE	287.25	Cooling Res ER2	0.0009474181	0.272146	12.0	\$0.00	3.1
354451_2023_12	MFc	ASHP-SEER19-Replace_CAC_ElectricHeat_ER2_MF_CompE	2,304.47	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
354460_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF	1,416.58	Cooling Res	0.0009474181	1.342094	6.0	\$1,753.37	3.1
354460_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354460_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_MF	394.97	Cooling Res ER2	0.0009474181	0.374202	12.0	\$0.00	3.1
354460_2023_12	MF	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_MF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354461_2023_12	Mfc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF_CompE	1,030.24	Cooling Res	0.0009474181	0.976068	6.0	\$1,753.37	3.1
354461_2023_12	Mfc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354461_2023_12	Mfc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_MF_CompE	287.25	Cooling Res ER2	0.0009474181	0.272146	12.0	\$0.00	3.3
354461_2023_12	Mfc	ASHP-SEER19-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354500_2023_12	MF	ASHP-SEER19_ER1_MF	1,507.97	Cooling Res	0.0009474181	1.428678	6.0	\$1,788.84	3.3
354500_2023_12	MF	ASHP-SEER19_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354500_2023_12	MF	ASHP-SEER19_ER2_MF	313.94	Cooling Res ER2	0.0009474181	0.297432	12.0	\$0.00	3.3
354500_2023_12	MF	ASHP-SEER19_ER2_MF	424.19	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354501_2023_12	Mfc	ASHP-SEER19_ER1_MF_CompE	1,096.71	Cooling Res	0.0009474181	1.039043	6.0	\$1,788.84	3.3
354501_2023_12	Mfc	ASHP-SEER19_ER1_MF_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354501_2023_12	Mfc	ASHP-SEER19_ER2_MF_CompE	228.32	Cooling Res ER2	0.0009474181	0.216315	12.0	\$0.00	2.6
354501_2023_12	Mfc	ASHP-SEER19_ER2_MF_CompE	144.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354550_2023_12	SF	ASHP-SEER20_ER1_SF	2,567.77	Cooling Res	0.0009474181	2.432752	6.0	\$2,149.16	2.6
354550_2023_12	SF	ASHP-SEER20_ER1_SF	2,572.52	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354550_2023_12	SF	ASHP-SEER20_ER2_SF	559.23	Cooling Res ER2	0.0009474181	0.529825	12.0	\$0.00	2.9
354550_2023_12	SF	ASHP-SEER20_ER2_SF	917.04	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354600_2023_12	SF	ASHP-SEER20_ROF_SF	559.80	Cooling Res	0.0009474181	0.530365	18.0	\$1,444.38	2.9
354600_2023_12	SF	ASHP-SEER20_ROF_SF	1,044.78	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354650_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	1,471.88	Cooling Res	0.0009474181	1.394486	6.0	\$1,994.10	3.1
354650_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354650_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF	450.27	Cooling Res ER2	0.0009474181	0.426594	12.0	\$0.00	3.1
354650_2023_12	MF	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354651_2023_12	Mfc	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF_CompE	1,070.46	Cooling Res	0.0009474181	1.014173	6.0	\$1,994.10	3.1
354651_2023_12	Mfc	ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF_CompE	2,304.47	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354651_2023_12	Mfc	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF_CompE	327.47	Cooling Res ER2	0.0009474181	0.310251	12.0	\$0.00	3.1
354651_2023_12	Mfc	ASHP-SEER20-Replace_CAC_ElectricHeat_ER2_MF_CompE	2,304.47	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354660_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF	1,471.88	Cooling Res	0.0009474181	1.394486	6.0	\$1,994.10	3.1
354660_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354660_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_MF	450.27	Cooling Res ER2	0.0009474181	0.426594	12.0	\$0.00	3.1
354660_2023_12	MF	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_MF	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354661_2023_12	Mfc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF_CompE	1,070.46	Cooling Res	0.0009474181	1.014173	6.0	\$1,994.10	3.1
354661_2023_12	Mfc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354661_2023_12	Mfc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_MF_CompE	327.47	Cooling Res ER2	0.0009474181	0.310251	12.0	\$0.00	3.3
354661_2023_12	Mfc	ASHP-SEER20-Replace_CAC_NonElectricHeat_ER2_MF_CompE	0.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354700_2023_12	MF	ASHP-SEER20_ER1_MF	1,566.84	Cooling Res	0.0009474181	1.484453	6.0	\$2,029.57	3.3
354700_2023_12	MF	ASHP-SEER20_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354700_2023_12	MF	ASHP-SEER20_ER2_MF	372.80	Cooling Res ER2	0.0009474181	0.353197	12.0	\$0.00	3.3
354700_2023_12	MF	ASHP-SEER20_ER2_MF	424.19	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354701_2023_12	Mfc	ASHP-SEER20_ER1_MF_CompE	1,139.52	Cooling Res	0.0009474181	1.079602	6.0	\$2,029.57	3.3
354701_2023_12	Mfc	ASHP-SEER20_ER1_MF_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354701_2023_12	Mfc	ASHP-SEER20_ER2_MF_CompE	271.13	Cooling Res ER2	0.0009474181	0.256873	12.0	\$0.00	3.3
354701_2023_12	Mfc	ASHP-SEER20_ER2_MF_CompE	144.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354750_2023_12	SF	ASHP-SEER21_ER1_SF	2,702.24	Cooling Res	0.0009474181	2.560151	6.0	\$2,602.23	3.3
354750_2023_12	SF	ASHP-SEER21_ER1_SF	3,540.79	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354750_2023_12	SF	ASHP-SEER21_ER2_SF	723.75	Cooling Res ER2	0.0009474181	0.685694	12.0	\$0.00	2.8
354750_2023_12	SF	ASHP-SEER21_ER2_SF	1,397.84	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354800_2023_12	SF	ASHP-SEER21_ROF_SF	812.08	Cooling Res	0.0009474181	0.769379	18.0	\$1,689.92	2.8
354800_2023_12	SF	ASHP-SEER21_ROF_SF	1,371.70	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354850_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF	451.88	Cooling Res	0.0009474181	0.428119	18.0	\$1,689.92	2.8
354850_2023_12	MF	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354851_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF_CompE	328.64	Cooling Res	0.0009474181	0.311359	18.0	\$1,689.92	2.8
354851_2023_12	Mfc	ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354860_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF	451.88	Cooling Res	0.0009474181	0.428119	18.0	\$1,689.92	2.8
354860_2023_12	MF	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354861_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF_CompE	328.64	Cooling Res	0.0009474181	0.311359	18.0	\$1,689.92	2.8
354861_2023_12	Mfc	ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF_CompE	0.00	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354900_2023_12	MF	ASHP-SEER21_ER1_MF	1,620.10	Cooling Res	0.0009474181	1.534912	6.0	\$2,275.11	3.3
354900_2023_12	MF	ASHP-SEER21_ER1_MF	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354900_2023_12	MF	ASHP-SEER21_ER2_MF	426.06	Cooling Res ER2	0.0009474181	0.403657	12.0	\$0.00	3.3
354900_2023_12	MF	ASHP-SEER21_ER2_MF	424.19	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
354901_2023_12	Mfc	ASHP-SEER21_ER1_MF_CompE	1,178.25	Cooling Res	0.0009474181	1.116295	6.0	\$2,275.11	3.3
354901_2023_12	Mfc	ASHP-SEER21_ER1_MF_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354901_2023_12	Mfc	ASHP-SEER21_ER2_MF_CompE	309.86	Cooling Res ER2	0.0009474181	0.293567	12.0	\$0.00	
354901_2023_12	Mfc	ASHP-SEER21_ER2_MF_CompE	144.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354950_2023_12	MF	ASHP-SEER17_ROF_MF	175.44	Cooling Res	0.0009474181	0.166215	18.0	\$724.00	3.3
354950_2023_12	MF	ASHP-SEER17_ROF_MF	548.27	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354951_2023_12	Mfc	ASHP-SEER17_ROF_MF_CompE	127.59	Cooling Res	0.0009474181	0.120881	18.0	\$724.00	3.3
354951_2023_12	Mfc	ASHP-SEER17_ROF_MF_CompE	186.91	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355000_2023_12	MF	ASHP-SEER18_ROF_MF	248.53	Cooling Res	0.0009474181	0.235462	18.0	\$962.92	3.3
355000_2023_12	MF	ASHP-SEER18_ROF_MF	548.27	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355001_2023_12	Mfc	ASHP-SEER18_ROF_MF_CompE	180.75	Cooling Res	0.0009474181	0.171246	18.0	\$962.92	3.3
355001_2023_12	Mfc	ASHP-SEER18_ROF_MF_CompE	186.91	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355050_2023_12	MF	ASHP-SEER19_ROF_MF	313.94	Cooling Res	0.0009474181	0.297432	18.0	\$1,203.65	3.3
355050_2023_12	MF	ASHP-SEER19_ROF_MF	548.27	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355051_2023_12	Mfc	ASHP-SEER19_ROF_MF_CompE	228.32	Cooling Res	0.0009474181	0.216315	18.0	\$1,203.65	3.3
355051_2023_12	Mfc	ASHP-SEER19_ROF_MF_CompE	186.91	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355100_2023_12	MF	ASHP-SEER20_ROF_MF	372.80	Cooling Res	0.0009474181	0.353197	18.0	\$1,444.38	3.3
355100_2023_12	MF	ASHP-SEER20_ROF_MF	548.27	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355101_2023_12	Mfc	ASHP-SEER20_ROF_MF_CompE	271.13	Cooling Res	0.0009474181	0.256873	18.0	\$1,444.38	3.3
355101_2023_12	Mfc	ASHP-SEER20_ROF_MF_CompE	186.91	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355150_2023_12	MF	ASHP-SEER21_ROF_MF	426.06	Cooling Res	0.0009474181	0.403657	18.0	\$1,689.92	3.3
355150_2023_12	MF	ASHP-SEER21_ROF_MF	548.27	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355151_2023_12	Mfc	ASHP-SEER21_ROF_MF_CompE	309.86	Cooling Res	0.0009474181	0.293567	18.0	\$1,689.92	3.3
355151_2023_12	Mfc	ASHP-SEER21_ROF_MF_CompE	186.91	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

Packaged Terminal Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
356200_2022_12	MF	PTHP-SEER12-ER1_MF	415.90	Cooling Res	0.0009474181	0.394031	5.0	\$224.93	1.01
356200_2022_12	MF	PTHP-SEER12-ER1_MF	1,229.91	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356200_2022_12	MF	PTHP-SEER12-ER2_MF	16.00	Cooling Res ER2	0.0009474181	0.015159	10.0	\$0.00	
356200_2022_12	MF	PTHP-SEER12-ER2_MF	112.08	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356225_2022_12	Mfc	PTHP-SEER12-ER1_MF_CompE	302.66	Cooling Res	0.0009474181	0.286746	5.0	\$224.93	1.01
356225_2022_12	Mfc	PTHP-SEER12-ER1_MF_CompE	419.83	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356225_2022_12	Mfc	PTHP-SEER12-ER2_MF_CompE	11.64	Cooling Res ER2	0.0009474181	0.011028	10.0	\$0.00	
356225_2022_12	Mfc	PTHP-SEER12-ER2_MF_CompE	38.26	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356250_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF	477.07	Cooling Res	0.0009474181	0.451985	5.0	\$224.93	1.01
356250_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF	2,610.79	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356250_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF	16.00	Cooling Res ER2	0.0009474181	0.015159	10.0	\$0.00	
356250_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF	2,610.79	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356275_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF_CompE	347.17	Cooling Res	0.0009474181	0.328915	5.0	\$224.93	1.01
356275_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF_CompE	891.18	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356275_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF_CompE	11.64	Cooling Res ER2	0.0009474181	0.011028	10.0	\$0.00	
356275_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ER2_MF_CompE	891.18	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356300_2022_12	MF	PTHP-SEER12-ROF_MF	16.00	Cooling Res	0.0009474181	0.015159	15.0	\$84.93	1.01
356300_2022_12	MF	PTHP-SEER12-ROF_MF	112.08	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356325_2022_12	Mfc	PTHP-SEER12-ROF_MF_CompE	11.64	Cooling Res	0.0009474181	0.011028	15.0	\$84.93	1.01
356325_2022_12	Mfc	PTHP-SEER12-ROF_MF_CompE	38.26	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356350_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF	16.00	Cooling Res	0.0009474181	0.015159	15.0	\$84.93	1.01
356350_2022_12	MF	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF	2,610.79	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356375_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF_CompE	11.64	Cooling Res	0.0009474181	0.011028	15.0	\$84.93	1.01
356375_2022_12	Mfc	PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF_CompE	891.18	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356400_2022_12	MF	PTHP-SEER13-ER1_MF	463.89	Cooling Res	0.0009474181	0.439498	5.0	\$224.93	1.01
356400_2022_12	MF	PTHP-SEER13-ER1_MF	1,248.41	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356400_2022_12	MF	PTHP-SEER13-ER2_MF	63.99	Cooling Res ER2	0.0009474181	0.060625	10.0	\$0.00	
356400_2022_12	MF	PTHP-SEER13-ER2_MF	130.58	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356425_2022_12	Mfc	PTHP-SEER13-ER1_MF_CompE	337.58	Cooling Res	0.0009474181	0.319829	5.0	\$224.93	1.01
356425_2022_12	Mfc	PTHP-SEER13-ER1_MF_CompE	426.14	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356425_2022_12	Mfc	PTHP-SEER13-ER2_MF_CompE	46.56	Cooling Res ER2	0.0009474181	0.044112	10.0	\$0.00	
356425_2022_12	Mfc	PTHP-SEER13-ER2_MF_CompE	44.57	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	

RESIDENTIAL HVAC

Packaged Terminal Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
356450_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF	525.05	Cooling Res	0.0009474181	0.497442	5.0	\$224.93	1.01
356450_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF	2,629.29	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356450_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF	63.99	Cooling Res ER2	0.0009474181	0.060625	10.0	\$0.00	
356450_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF	2,629.29	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356475_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF_CompE	382.09	Cooling Res	0.0009474181	0.361999	5.0	\$224.93	1.01
356475_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF_CompE	897.50	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356475_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF_CompE	46.56	Cooling Res ER2	0.0009474181	0.044112	10.0	\$0.00	
356475_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ER2_MF_CompE	897.50	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356500_2022_12	MF	PTHP-SEER13-ROF_MF	63.99	Cooling Res	0.0009474181	0.060625	15.0	\$84.93	1.01
356500_2022_12	MF	PTHP-SEER13-ROF_MF	130.58	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356525_2022_12	Mfc	PTHP-SEER13-ROF_MF_CompE	46.56	Cooling Res	0.0009474181	0.044112	15.0	\$84.93	1.01
356525_2022_12	Mfc	PTHP-SEER13-ROF_MF_CompE	44.57	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356550_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF	63.99	Cooling Res	0.0009474181	0.060625	15.0	\$84.93	1.01
356550_2022_12	MF	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF	2,629.29	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356575_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF_CompE	46.56	Cooling Res	0.0009474181	0.044112	15.0	\$84.93	1.01
356575_2022_12	Mfc	PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF_CompE	897.50	Heating Res	0.0000000000	0.000000	15.0	\$0.00	

Packaged Terminal Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
356600_2022_12	MF	PTHP-SEER14-ER1_MF	505.03	Cooling Res	0.0009474181	0.478475	5.0	\$224.93	1.01
356600_2022_12	MF	PTHP-SEER14-ER1_MF	1,288.67	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356600_2022_12	MF	PTHP-SEER14-ER2_MF	105.12	Cooling Res ER2	0.0009474181	0.099593	10.0	\$0.00	
356600_2022_12	MF	PTHP-SEER14-ER2_MF	170.84	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356625_2022_12	Mfc	PTHP-SEER14-ER1_MF_CompE	367.51	Cooling Res	0.0009474181	0.348186	5.0	\$224.93	1.01
356625_2022_12	Mfc	PTHP-SEER14-ER1_MF_CompE	439.88	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356625_2022_12	Mfc	PTHP-SEER14-ER2_MF_CompE	76.50	Cooling Res ER2	0.0009474181	0.072477	10.0	\$0.00	
356625_2022_12	Mfc	PTHP-SEER14-ER2_MF_CompE	58.32	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356650_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF	566.19	Cooling Res	0.0009474181	0.536419	5.0	\$224.93	1.01
356650_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF	2,669.55	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356650_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF	105.12	Cooling Res ER2	0.0009474181	0.099593	10.0	\$0.00	
356650_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF	2,669.55	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356675_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF_CompE	412.02	Cooling Res	0.0009474181	0.390355	5.0	\$224.93	1.01
356675_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF_CompE	911.24	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356675_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF_CompE	76.50	Cooling Res ER2	0.0009474181	0.072477	10.0	\$0.00	
356675_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ER2_MF_CompE	911.24	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356700_2022_12	MF	PTHP-SEER14-ROF_MF	105.12	Cooling Res	0.0009474181	0.099593	15.0	\$84.93	1.01
356700_2022_12	MF	PTHP-SEER14-ROF_MF	170.84	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356725_2022_12	Mfc	PTHP-SEER14-ROF_MF_CompE	76.50	Cooling Res	0.0009474181	0.072477	15.0	\$84.93	1.01
356725_2022_12	Mfc	PTHP-SEER14-ROF_MF_CompE	58.32	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356750_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF	105.12	Cooling Res	0.0009474181	0.099593	15.0	\$84.93	1.01
356750_2022_12	MF	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF	2,669.55	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356775_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF_CompE	76.50	Cooling Res	0.0009474181	0.072477	15.0	\$84.93	1.01
356775_2022_12	Mfc	PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF_CompE	911.24	Heating Res	0.0000000000	0.000000	15.0	\$0.00	

RESIDENTIAL HVAC

Packaged Terminal Air Source Heat Pumps

*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units (tons/measure)
356800_2022_12_	MF	PTHP-SEER15-ER1_MF	540.67	Cooling Res	0.0009474181	0.512241	5.0	\$224.93	1.01
356800_2022_12_	MF	PTHP-SEER15-ER1_MF	1,328.35	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356800_2022_12_	MF	PTHP-SEER15-ER2_MF	140.77	Cooling Res ER2	0.0009474181	0.133368	10.0	\$0.00	
356800_2022_12_	MF	PTHP-SEER15-ER2_MF	210.52	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356825_2022_12_	Mfc	PTHP-SEER15-ER1_MF_CompE	393.46	Cooling Res	0.0009474181	0.372771	5.0	\$224.93	1.01
356825_2022_12_	Mfc	PTHP-SEER15-ER1_MF_CompE	453.43	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356825_2022_12_	Mfc	PTHP-SEER15-ER2_MF_CompE	102.44	Cooling Res ER2	0.0009474181	0.097054	10.0	\$0.00	
356825_2022_12_	Mfc	PTHP-SEER15-ER2_MF_CompE	71.86	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356850_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF	601.84	Cooling Res	0.0009474181	0.570194	5.0	\$224.93	1.01
356850_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF	2,709.23	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356850_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF	140.77	Cooling Res ER2	0.0009474181	0.133368	10.0	\$0.00	
356850_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF	2,709.23	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356875_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF_CompE	437.97	Cooling Res	0.0009474181	0.414941	5.0	\$224.93	1.01
356875_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF_CompE	924.79	Heating Res	0.0000000000	0.000000	5.0	\$0.00	
356875_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF_CompE	102.44	Cooling Res ER2	0.0009474181	0.097054	10.0	\$0.00	
356875_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ER2_MF_CompE	924.79	Heating Res ER2	0.0000000000	0.000000	10.0	\$0.00	
356900_2022_12_	MF	PTHP-SEER15-ROF_MF	140.77	Cooling Res	0.0009474181	0.133368	15.0	\$84.93	1.01
356900_2022_12_	MF	PTHP-SEER15-ROF_MF	210.52	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356925_2022_12_	Mfc	PTHP-SEER15-ROF_MF_CompE	102.44	Cooling Res	0.0009474181	0.097054	15.0	\$84.93	1.01
356925_2022_12_	Mfc	PTHP-SEER15-ROF_MF_CompE	71.86	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356950_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF	140.77	Cooling Res	0.0009474181	0.133368	15.0	\$84.93	1.01
356950_2022_12_	MF	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF	2,709.23	Heating Res	0.0000000000	0.000000	15.0	\$0.00	
356975_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF_CompE	102.44	Cooling Res	0.0009474181	0.097054	15.0	\$84.93	1.01
356975_2022_12_	Mfc	PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF_CompE	924.79	Heating Res	0.0000000000	0.000000	15.0	\$0.00	

RESIDENTIAL INCOME ELIGIBLE

Dirty Filter Alarm

*MFIEC = Multifamily Income Eligible Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units
402250_2019_12	MFIE	Dirty Filter Alarm_MFIE	102.68	HVAC RES	0.0004660805	65.0	37.7	0.047857	14.0	\$5.00	per measure
402251_2019_12	MFIEC	Dirty Filter Alarm_MFIE_CompE	49.58	HVAC RES	0.0004660805	22.1	27.4	0.023108	14.0	\$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_2019_12	SFIE	Duct Insulation - Electric Heating	29.13	HVAC RES	0.0004660805	1.6	27.5	0.00	0.013577	20.0	\$4.22	1.0
402350_2019_12	SFIE	Mobile Home Adjusted Duct Insulation - Electric Heating	29.13	HVAC RES	0.0004660805	1.6	27.5	0.00	0.013577	20.0	\$4.22	1.0
402400_2019_12	SFIE	Duct Insulation - Gas Heating	2.69	HVAC RES	0.0004660805	1.6	1.1	1.20	0.001254	20.0	\$4.22	1.0

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_2019_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_2021_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_2020_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_2021_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_2019_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_2021_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
402550_2021_12	SFIE	ECM Auto Fan EUL Replacement -SF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000	20	\$74.33	per measure
402600_2021_12	SFIE	ECM Auto Fan Early Replacement ER1 (Full Cost) -SF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	6	\$475.00	per measure
402600_2021_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
402650_2021_12	SFIE	ECM Continuous Fan EUL Replacement -SF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000	20	\$74.33	per measure
402700_2021_12	SFIE	ECM Continuous Fan Early Replacement ER1 (Full Cost) -SF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259	6	\$475.00	per measure
402700_2021_12	SFIE	ECM Continuous 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
402750_2021_12	MFIE	ECM Auto Fan EUL Replacement - MF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000	20	\$74.33	per measure
402800_2021_12	MFIE	ECM Auto Fan Early Replacement ER1 (Full Cost) - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	6	\$475.00	per measure
402800_2021_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
402850_2021_12	MFIE	ECM Continuous Fan EUL Replacement - MF	0.00	HVAC RES	0.0004660805	0.0	0.0	0.0	0.0	0.000000	20	\$74.33	per measure
402900_2021_12	MFIE	ECM Continuous Fan Early Replacement ER1 (Full Cost) - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259	6	\$475.00	per measure
402900_2021_12	MFIE	ECM Continuous 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(y)). 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

*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
402950_2019_12	SFIE	General HP tune-up (no charge or coil clean)	141.72	Cooling RES	0.0009474181	0.134268	2.0	\$70.00	per measure
402950_2019_12	SFIE	General HP tune-up (no charge or coil clean)	114.06	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403000_2019_12	MFIE	General HP tune-up (no charge or coil clean)	87.28	Cooling RES	0.0009474181	0.082691	2.0	\$70.00	per measure
403000_2019_12	MFIE	General HP tune-up (no charge or coil clean)	70.25	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403050_2019_12	SFIE	HP tune-up / Refrigerant charge SF	591.08	Cooling RES	0.0009474181	0.560000	2.0	\$81.00	per measure
403050_2019_12	SFIE	HP tune-up / Refrigerant charge SF	549.10	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403100_2019_12	MFIE	HP tune-up / Refrigerant charge MF	364.03	Cooling RES	0.0009474181	0.344889	2.0	\$81.00	per measure
403100_2019_12	MFIE	HP tune-up / Refrigerant charge MF	338.18	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403101_2019_12	MFIEC	HP tune-up / Refrigerant charge MF_CompE	264.75	Cooling RES	0.0009474181	0.250829	2.0	\$81.00	per measure
403101_2019_12	MFIEC	HP tune-up / Refrigerant charge MF_CompE	115.29	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403150_2019_12	SFIE	HP tune-up / Indoor Coil (Evaporator) Cleaning SF	97.83	Cooling RES	0.0009474181	0.092686	2.0	\$63.00	per measure
403150_2019_12	SFIE	HP tune-up / Indoor Coil (Evaporator) Cleaning SF	77.73	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403200_2019_12	MFIE	HP tune-up / Indoor Coil (Evaporator) Cleaning MF	60.25	Cooling RES	0.0009474181	0.057082	2.0	\$63.00	per measure
403200_2019_12	MFIE	HP tune-up / Indoor Coil (Evaporator) Cleaning MF	47.87	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403201_2019_12	MFIEC	HP tune-up / Indoor Coil (Evaporator) Cleaning MF_CompE	43.82	Cooling RES	0.0009474181	0.041516	2.0	\$63.00	per measure
403201_2019_12	MFIEC	HP tune-up / Indoor Coil (Evaporator) Cleaning MF_CompE	16.32	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403250_2019_12	SFIE	HP tune-up / Outdoor Coil (Condenser) Cleaning SF	195.66	Cooling RES	0.0009474181	0.185372	2.0	\$31.00	per measure
403250_2019_12	SFIE	HP tune-up / Outdoor Coil (Condenser) Cleaning SF	160.04	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403300_2019_12	MFIE	HP tune-up / Outdoor Coil (Condenser) Cleaning MF	120.50	Cooling RES	0.0009474181	0.114164	2.0	\$31.00	per measure
403300_2019_12	MFIE	HP tune-up / Outdoor Coil (Condenser) Cleaning MF	98.57	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403301_2019_12	MFIEC	HP tune-up / Outdoor Coil (Condenser) Cleaning MF_CompE	87.64	Cooling RES	0.0009474181	0.083032	2.0	\$31.00	per measure
403301_2019_12	MFIEC	HP tune-up / Outdoor Coil (Condenser) Cleaning MF_CompE	33.60	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403310_2021_12	SFIE	HP tune-up / Packaged Service SF	367.92	Cooling RES	0.0009474181	0.348284	2.0	\$185.00	per measure
403310_2021_12	SFIE	HP tune-up / Packaged Service SF	1180.10	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
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
403312_2021_12	MFIEC	HP tune-up / Packaged Service MF_CompE	164.80	Cooling RES	0.0009474181	0.156135	2.0	\$185.00	per measure
403312_2021_12	MFIEC	HP tune-up / Packaged Service MF_CompE	247.77	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure

RESIDENTIAL INCOME ELIGIBLE

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
403350_2019_12	MFIE	Low Flow Bathroom Faucet Aerator MFIE	17.77	Water heating RES	0.0000887318	0.047	0.001577	11.0	\$3.00	per measure
403351_2020_12	SFIE	Low Flow Bathroom Faucet Aerator SFIE	17.77	Water heating RES	0.0000887318	0.047	0.001577	11.0	\$3.00	per measure
403400_2019_12	MFIE DI	Low Flow Bathroom Faucet Aerator MFIE DI	35.17	Water heating RES	0.0000887318	0.047	0.003121	11.0	\$11.33	per measure
403450_2019_12	SFIE DI	Low Flow Bathroom Faucet Aerator SFIE DI	35.17	Water heating RES	0.0000887318	0.047	0.003121	11.0	\$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
403470_2020_12	MFIE	Low Flow Kitchen Faucet Aerator MFIE	46.75	Water Heating RES	0.0000887318	0.079	0.004148	11.0	\$3.00	per measure
403471_2020_12	SFIE	Low Flow Kitchen Faucet Aerator SFIE	46.75	Water Heating RES	0.0000887318	0.079	0.004148	11.0	\$3.00	per measure
403480_2020_12	MFIE DI	Low Flow Kitchen Faucet Aerator MFIE DI	111.03	Water Heating RES	0.0000887318	0.079	0.009852	11.0	\$11.33	per measure
403481_2020_12	SFIE DI	Low Flow Kitchen Faucet Aerator SFIE DI	111.03	Water Heating RES	0.0000887318	0.079	0.009852	11.0	\$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
403500_2021_12	MFIE	Low Flow Showerhead MFIE	220.38	Water heating RES	0.0000887318	0.109	0.019555	10.0	\$7.00	per measure
403550_2021_12	MFIE DI	Low Flow Showerhead MFIE DI	232.58	Water heating RES	0.0000887318	0.109	0.020637	10.0	\$15.33	per measure
403551_2021_12	MFIE DI	Low Flow Handheld Showerhead MFIE DI	232.58	Water heating RES	0.0000887318	0.109	0.020637	10.0	\$23.35	per measure
403600_2021_12	SFIE DI	Low Flow Showerhead SFIE DI	194.77	Water heating RES	0.0000887318	0.109	0.017282	10.0	\$15.33	per measure
403601_2021_12	SFIE DI	Low Flow Handheld Showerhead SFIE DI	194.77	Water heating RES	0.0000887318	0.109	0.017282	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
403650_2019_12	MFIE	Pipe Insulation MFIE	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$7.10	per foot
403700_2019_12	MFIE DI	Pipe Insulation MFIE DI	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$5.66	per foot
403750_2019_12	SFIE DI	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	201.39	Cooling RES	0.0009474181	0.190801	10.0	\$70.00	per measure
403800_2019_12	MFIE	Setback thermostat - full setback - ASHP heating/cooling MF	30.37	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403801_2019_12	MFIEC	Setback thermostat - full setback - ASHP heating/cooling MF_CompE	146.46	Cooling RES	0.0009474181	0.138759	10.0	\$70.00	per measure
403801_2019_12	MFIEC	Setback thermostat - full setback - ASHP heating/cooling MF_CompE	10.35	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403850_2019_12	SFIE	Setback thermostat - full setback - ASHP heating/cooling SF	358.20	Cooling RES	0.0009474181	0.339365	10.0	\$70.00	per measure
403850_2019_12	SFIE	Setback thermostat - full setback - ASHP heating/cooling SF	87.38	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	201.39	Cooling RES	0.0009474181	0.190801	10.0	\$70.00	per measure
403900_2019_12	MFIE	Setback thermostat - full setback - elec furnace heating / central AC MF	62.33	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403901_2019_12	MFIEC	Setback thermostat - full setback - elec furnace heating / central AC MF_CompE	146.46	Cooling RES	0.0009474181	0.138759	10.0	\$70.00	per measure
403901_2019_12	MFIEC	Setback thermostat - full setback - elec furnace heating / central AC MF_CompE	21.25	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
403950_2019_12	SFIE	Setback thermostat - full setback - elec furnace heating / central AC SF	358.20	Cooling RES	0.0009474181	0.339365	10.0	\$70.00	per measure
403950_2019_12	SFIE	Setback thermostat - full setback - elec furnace heating / central AC SF	148.63	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404000_2019_12	MFIE	Setback thermostat - full setback - gas heating / central AC MF	201.39	Cooling RES	0.0009474181	0.190800	10.0	\$70.00	per measure
404000_2019_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
404001_2019_12	MFIEC	Setback thermostat - full setback - gas heating / central AC MF_CompE	146.46	Cooling RES	0.0009474181	0.138763	10.0	\$70.00	per measure
404001_2019_12	MFIEC	Setback thermostat - full setback - gas heating / central AC MF_CompE	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	358.20	Cooling RES	0.0009474181	0.339365	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
404100_2019_12	MFIE	Setback thermostat - full setback - Unknown MF	201.39	Cooling RES	0.0009474181	0.190801	10.0	\$70.00	per measure
404100_2019_12	MFIE	Setback thermostat - full setback - Unknown MF	15.49	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404101_2019_12	MFIEC	Setback thermostat - full setback - Unknown MF_CompE	146.46	Cooling RES	0.0009474181	0.138759	10.0	\$70.00	per measure
404101_2019_12	MFIEC	Setback thermostat - full setback - Unknown MF_CompE	5.28	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404150_2019_12	SFIE	Setback thermostat for SF - full setback - Unknown	358.20	Cooling RES	0.0009474181	0.339365	10.0	\$70.00	per measure
404150_2019_12	SFIE	Setback thermostat for SF - full setback - Unknown	32.33	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure

Thermostatic Restrictor Shower Valve

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
404200_2019_12	SFIE DI	Shower Start 1.5 gpm electric water heater SFIE DI	41.68	Water heating RES	0.0000887318	0.109	0.003698	10.0	\$50.00	per measure
404250_2019_12	MFIE DI	Shower Start 1.5 gpm electric water heater MFIE DI	47.32	Water heating RES	0.0000887318	1.856	0.004199	10.0	\$50.00	per measure

Water Heater Wrap

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
404300_2019_12	SFIE	Water Heater Wrap SFIE	100.55	Water heating RES	0.0000887318	0.008922	12.0	\$58.00	per measure
404301_2023_12	MFIE	Water Heater Wrap MFIE	100.55	Water heating RES	0.0000887318	0.008922	12.0	\$58.00	per measure

RESIDENTIAL INCOME ELIGIBLE

Common Area Faucet Aerators

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
404350_2019_12	MFIE	Common Area Low Flow Bathroom Faucet Aerator	28.40	Water heating RES	0.0000887318	0.071	0.002520	10.0	\$11.33	per measure

Common Area Low Flow Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
404400_2019_12	MFIE DI	Common Area Low Flow Showerhead	213.29	Water heating RES	0.0000887318	0.109	0.018926	10.0	\$7.00	per measure

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
													SF	MF	
404450_2023_12	SFIE / MFIE	LED - 10.5W Downlight E26 (EISA baseline) IE DI	5.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.2	0.0000000	0.000782	19.0	6.0	\$6.00	\$3.30	per measure
404500_2019_12	SFIE / MFIE	LED - 10W (Halogen baseline) (750-1049 lumens) IEDI	22.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	22.2	0.0000000	0.003316	19.0	6.0	\$6.00	\$3.68	per measure
404550_2019_12	SFIE / MFIE	LED - 12W (Halogen baseline) IE DI	23.0	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.0	0.0000000	0.003425	19.0	6.0	\$6.00	\$4.72	per measure
404600_2023_12	SFIE / MFIE	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent) IE DI	5.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.5	0.0000000	0.000822	19.0	6.0	\$6.00	\$3.53	per measure
404650_2019_12	SFIE / MFIE	LED - 15W (Halogen baseline) (1050-1489 lumens) IEDI	27.8	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.8	0.0000000	0.004147	19.0	6.0	\$8.00	\$6.27	per measure
404651_2020_12	SFIE / MFIE	LED - 11W Flood Light BR30 Bulb (Halogen baseline) IE DI	35.4	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	35.4	0.0000000	0.005282	19.0	6.0	\$10.00	\$4.92	per measure
404700_2019_12	SFIE / MFIE	LED - 15W Flood Light PAR30 Bulb (Halogen baseline) IE DI	26.9	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	26.9	0.0000000	0.004010	19.0	6.0	\$10.00	\$4.92	per measure
404750_2019_12	SFIE / MFIE	LED - 18W Flood Light PAR38 Bulb (Halogen baseline) IE DI	34.7	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	34.7	0.0000000	0.005184	19.0	6.0	\$15.00	\$4.92	per measure
404800_2019_12	SFIE / MFIE	LED - 20W (Halogen baseline) (1490-2600 lumens) IEDI	37.4	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	37.4	0.0000000	0.005575	19.0	6.0	\$8.00	\$7.83	per measure
404850_2019_12	SFIE / MFIE	LED - 4W Candelabra (Replacing Specialty Incandescent) IE DI	23.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.5	0.0000000	0.003512	19.0	6.0	\$7.00	\$3.27	per measure
404900_2019_12	SFIE / MFIE	LED - 4W Candelabra (CFL baseline) IEDI	3.0	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.9	0.0000000	0.000440	19.0	6.0	\$7.00	\$3.27	per measure
404950_2023_12	SFIE / MFIE	LED - 8W Globe Light G25 Bulb (Replacing Specialty Incandescent) IE DI	3.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.2	0.0000000	0.000479	19.0	6.0	\$7.00	\$3.27	per measure
405000_2023_12	SFIE / MFIE	LED - 8W Globe Light G25 Bulb (Replacing CFL) IEDI	3.2	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.2	0.0000000	0.000479	19.0	6.0	\$7.00	\$3.27	per measure
405050_2023_12	SFIE / MFIE	LED - 10W (CFL baseline) (750-1049 lumens) IEDI	7.1	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	7.1	0.0000000	0.001066	19.0	6.0	\$6.00	\$3.68	per measure
405100_2023_12	SFIE / MFIE	LED - 10.5W Downlight E26 (CFL baseline) IEDI	4.6	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.6	0.0000000	0.000685	19.0	6.0	\$6.00	\$3.30	per measure
405150_2023_12	SFIE / MFIE	LED - 20W Dimmable Light Bulb (Replacing CFL) IEDI	6.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.5	0.0000000	0.000968	19.0	6.0	\$6.00	\$3.53	per measure
405200_2023_12	SFIE / MFIE	LED - 12W (Replacing CFL) IEDI	6.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.5	0.0000000	0.000968	19.0	6.0	\$6.00	\$4.72	per measure
405250_2023_12	SFIE / MFIE	LED - 15W (CFL baseline) (1050-1489 lumens) IEDI	11.5	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	11.5	0.0000000	0.001721	19.0	6.0	\$8.00	\$6.27	per measure
405251_2023_12	SFIE / MFIE	LED - 11W Flood Light BR30 Bulb (CFL baseline) IEDI	2.6	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.6	0.0000000	0.000391	19.0	6.0	\$10.00	\$4.92	per measure
405300_2023_12	SFIE / MFIE	LED - 15W Flood Light PAR30 Bulb (CFL baseline) IEDI	9.0	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	9.0	0.0000000	0.001350	19.0	6.0	\$10.00	\$4.92	per measure
405350_2023_12	SFIE / MFIE	LED - 18W Flood Light PAR38 Bulb (CFL baseline) IEDI	4.6	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.6	0.0000000	0.000685	19.0	6.0	\$15.00	\$4.92	per measure
405400_2023_12	SFIE / MFIE	LED - 20W (CFL baseline) (1490-2600 lumens) IEDI	19.9	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	19.9	0.0000000	0.002973	19.0	6.0	\$8.00	\$7.83	per measure
405409_2023_12	SFIE / MFIE	LED - 6W (CFL baseline) (310-749 lumens) IE DI	3.8	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.8	0.0000000	0.000567	19.0	6.0	\$7.00	\$3.27	per measure
405410_2019_12	SFIE / MFIE	LED - 6W (Halogen baseline) (310-749 lumens) IEDI	15.1	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	15.1	0.0000000	0.002250	19.0	6.0	\$6.00	\$3.68	per measure
405430_2021_12	SFIE / MFIE	LED Nightlights	28.53	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	28.5	0.0000000	0.004258	19.0	6.0	\$6.00	\$3.68	per measure

**Measure Descriptions with reference to "(CFL Baseline)" are in fact aligned to the May 2022 EISA standards putting into effect the 45 lumen/watt backup provision

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
405450_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / TOS/NC - Home Office	29.450	Miscellaneous RES	0.0001148238	0.003382	10.0	\$20.00	per measure
405451_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / DI - Home Office	29.450	Miscellaneous RES	0.0001148238	0.003382	10.0	\$30.00	per measure
405500_2019_12	SFIE / MFIE	Advanced Tier 1 Power Strips / Kits - Home Office	24.180	Miscellaneous RES	0.0001148238	0.002776	10.0	\$20.00	per measure
405550_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / TOS/NC - Home Entertainment	71.350	Miscellaneous RES	0.0001148238	0.008193	10.0	\$20.00	per measure
405551_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / DI - Home Entertainment	71.350	Miscellaneous RES	0.0001148238	0.008193	10.0	\$30.00	per measure
405600_2019_12	SFIE / MFIE	Advanced Tier 1 Power Strips / Kits - Home Entertainment	58.580	Miscellaneous RES	0.0001148238	0.006726	10.0	\$20.00	per measure
405650_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / TOS/NC - Unknown Location	56.260	Miscellaneous RES	0.0001148238	0.006460	10.0	\$20.00	per measure
405651_2021_12	SFIE / MFIE	Advanced Tier 1 Power Strips / DI - Unknown Location	56.260	Miscellaneous RES	0.0001148238	0.006460	10.0	\$30.00	per measure
405700_2019_12	SFIE / MFIE	Advanced Tier 1 Power / Kits - Unknown Location	42.070	Miscellaneous RES	0.0001148238	0.004831	10.0	\$20.00	per measure
405750_2023_12	SFIE / MFIE	Advanced Tier 2 Power Strips / TOS/NC / Average	153.900	Miscellaneous RES	0.0001148238	0.017671	10.0	\$30.00	per measure
405751_2020_12	SFIE / MFIE	Advanced Tier 2 Power Strips / DI / Average	153.900	Miscellaneous RES	0.0001148238	0.017671	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_2019_12	SFIE / MFIE	Refrigerator - early replacement ER1	564.66	Refrigeration RES	0.0001285253	0.072573	6.0	\$753.00	per measure
405800_2019_12	SFIE / MFIE	Refrigerator - early replacement ER2	46.72	Refrigeration RES ER2	0.0001285253	0.006005	11.0	\$0.00	per measure
405825_2019_12	SFIE / MFIE	Refrigerator - Pre 1993 - ER1	1269.91	Refrigeration RES	0.0001285253	0.163216	6.0	\$753.00	per measure
405825_2019_12	SFIE / MFIE	Refrigerator - Pre 1993 - ER2	46.72	Refrigeration RES ER2	0.0001285253	0.006005	11.0	\$0.00	per measure

RESIDENTIAL INCOME ELIGIBLE

Energy Star Room AC

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
405850_2021_12	MFIE	AC - Energy Star Room _unknown size_ Thru-Wall_MF	190.46	Cooling RES	0.0009474181	0.180445	9.0	\$20.00	per measure
405900_2021_12	SFIE	AC - Energy Star Room _unknown size_ Thru-Wall_SF	75.04	Cooling RES	0.0009474181	0.071094	9.0	\$20.00	per measure
405950_2021_12	MFIE	AC - Energy Star Room _unknown size_MF	190.46	Cooling RES	0.0009474181	0.180445	9.0	\$20.00	per measure
406000_2021_12	SFIE	AC - Energy Star Room _unknown size_SF	75.04	Cooling RES	0.0009474181	0.071094	9.0	\$20.00	per measure
405851_2021_12	MFIE	AC - Energy Star Room_5k8btu_Thru-Wall_MF	81.08	Cooling RES	0.0009474181	0.076817	9.0	\$20.00	per measure
405901_2021_12	SFIE	AC - Energy Star Room_5k8btu_Thru-Wall_SF	36.35	Cooling RES	0.0009474181	0.034439	9.0	\$20.00	per measure
405951_2021_12	MFIE	AC - Energy Star Room_5k8btu_MF	81.08	Cooling RES	0.0009474181	0.076817	9.0	\$20.00	per measure
406001_2021_12	SFIE	AC - Energy Star Room_5k8btu_SF	36.35	Cooling RES	0.0009474181	0.034439	9.0	\$20.00	per measure
405852_2021_12	MFIE	AC - Energy Star Room_8k8btu_Thru-Wall_MF	129.73	Cooling RES	0.0009474181	0.122909	9.0	\$20.00	per measure
405902_2021_12	SFIE	AC - Energy Star Room_8k8btu_Thru-Wall_SF	58.16	Cooling RES	0.0009474181	0.055102	9.0	\$20.00	per measure
405952_2021_12	MFIE	AC - Energy Star Room_8k8btu_MF	129.73	Cooling RES	0.0009474181	0.122909	9.0	\$20.00	per measure
406002_2021_12	SFIE	AC - Energy Star Room_8k8btu_SF	58.16	Cooling RES	0.0009474181	0.055102	9.0	\$20.00	per measure
405853_2021_12	MFIE	AC - Energy Star Room_10k8btu_Thru-Wall_MF	162.16	Cooling RES	0.0009474181	0.153633	9.0	\$20.00	per measure
405903_2021_12	SFIE	AC - Energy Star Room_10k8btu_Thru-Wall_SF	72.70	Cooling RES	0.0009474181	0.068877	9.0	\$20.00	per measure
405953_2021_12	MFIE	AC - Energy Star Room_10k8btu_MF	162.16	Cooling RES	0.0009474181	0.153633	9.0	\$20.00	per measure
406003_2021_12	SFIE	AC - Energy Star Room_10k8btu_SF	72.70	Cooling RES	0.0009474181	0.068877	9.0	\$20.00	per measure
405854_2021_12	MFIE	AC - Energy Star Room_12k8btu_Thru-Wall_MF	194.59	Cooling RES	0.0009474181	0.184358	9.0	\$20.00	per measure
405904_2021_12	SFIE	AC - Energy Star Room_12k8btu_Thru-Wall_SF	87.24	Cooling RES	0.0009474181	0.082653	9.0	\$20.00	per measure
405954_2021_12	MFIE	AC - Energy Star Room_12k8btu_MF	194.59	Cooling RES	0.0009474181	0.184358	9.0	\$20.00	per measure
406004_2021_12	SFIE	AC - Energy Star Room_12k8btu_SF	87.24	Cooling RES	0.0009474181	0.082653	9.0	\$20.00	per measure
405855_2021_12	MFIE	AC - Energy Star Room_15k8btu_Thru-Wall_MF	243.24	Cooling RES	0.0009474181	0.230450	9.0	\$20.00	per measure
405905_2021_12	SFIE	AC - Energy Star Room_15k8btu_Thru-Wall_SF	109.05	Cooling RES	0.0009474181	0.103316	9.0	\$20.00	per measure
405955_2021_12	MFIE	AC - Energy Star Room_15k8btu_MF	243.24	Cooling RES	0.0009474181	0.230450	9.0	\$20.00	per measure
406005_2021_12	SFIE	AC - Energy Star Room_15k8btu_SF	109.05	Cooling RES	0.0009474181	0.103316	9.0	\$20.00	per measure

Storm Window

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
406025_2020_12	SFIE / MFIE	Storm Window - Single Pane, Double Hung - Electric Furnace	17.54	Building Shell RES	0.0004660805	0.008173	20	\$9.29	per sq ft
406050_2020_12	SFIE / MFIE	Storm Window - Single Pane, Double Hung - Heat Pump	10.42	Building Shell RES	0.0004660805	0.004856	20	\$9.29	per sq ft
406075_2020_12	SFIE / MFIE	Storm Window - Single Pane, Double Hung - Gas Heating	2.39	Building Shell RES	0.0004660805	0.001114	20	\$9.29	per sq ft
406100_2020_12	SFIE / MFIE	Storm Window - Double Pane, Double Hung - Electric Furnace	5.90	Building Shell RES	0.0004660805	0.002751	20	\$9.29	per sq ft
406125_2020_12	SFIE / MFIE	Storm Window - Double Pane, Double Hung - Heat Pump	3.67	Building Shell RES	0.0004660805	0.001711	20	\$9.29	per sq ft
406150_2020_12	SFIE / MFIE	Storm Window - Double Pane, Double Hung - Gas Heating	1.15	Building Shell RES	0.0004660805	0.000538	20	\$9.29	per sq ft
406175_2020_12	SFIE / MFIE	Storm Window - Single Pane, Fixed - Electric Furnace	17.53	Building Shell RES	0.0004660805	0.008170	20	\$9.29	per sq ft
406200_2020_12	SFIE / MFIE	Storm Window - Single Pane, Fixed - Heat Pump	10.41	Building Shell RES	0.0004660805	0.004854	20	\$9.29	per sq ft
406225_2020_12	SFIE / MFIE	Storm Window - Single Pane, Fixed - Gas Heating	2.39	Building Shell RES	0.0004660805	0.001114	20	\$9.29	per sq ft
406250_2020_12	SFIE / MFIE	Storm Window - Double Pane, Fixed - Electric Furnace	5.59	Building Shell RES	0.0004660805	0.002608	20	\$9.29	per sq ft
406275_2020_12	SFIE / MFIE	Storm Window - Double Pane, Fixed - Heat Pump	3.42	Building Shell RES	0.0004660805	0.001592	20	\$9.29	per sq ft
406300_2020_12	SFIE / MFIE	Storm Window - Double Pane, Fixed - Gas Heating	0.96	Building Shell RES	0.0004660805	0.000446	20	\$9.29	per sq ft

Learning Thermostat / Advanced Thermostat

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
406500_2022_12	SFIE	Learning Thermostat - ASHP heating/cooling SF	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406500_2022_12	SFIE	Learning Thermostat - ASHP heating/cooling SF	557.16	Heating RES	0.0000000000	0.000000	10.0		per measure
406525_2022_12	MFIE	Learning Thermostat - ASHP heating/cooling MF	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406525_2022_12	MFIE	Learning Thermostat - ASHP heating/cooling MF	362.16	Heating RES	0.0000000000	0.000000	10.0		per measure
406550_2022_12	MFIE	Learning Thermostat - electric furnace heating / central AC MF	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406550_2022_12	MFIE	Learning Thermostat - electric furnace heating / central AC MF	615.61	Heating RES	0.0000000000	0.000000	10.0		per measure
406575_2022_12	SFIE	Learning Thermostat - electric furnace heating / central AC SF	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406575_2022_12	SFIE	Learning Thermostat - electric furnace heating / central AC SF	947.09	Heating RES	0.0000000000	0.000000	10.0		per measure
406600_2022_12	SFIE	Learning Thermostat - Gas Heated / central AC SF**	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406600_2022_12	SFIE	Learning Thermostat - Gas Heated / central AC SF**	41.85	Heating RES	0.0000000000	0.000000	10.0		per measure
406625_2022_12	MFIE	Learning Thermostat - Gas Heated / central AC MF**	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406625_2022_12	MFIE	Learning Thermostat - Gas Heated / central AC MF**	27.20	Heating RES	0.0000000000	0.000000	10.0		per measure
406650_2022_12	SFIE	Learning Thermostat - Unknown SF**	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406650_2022_12	SFIE	Learning Thermostat - Unknown SF**	280.15	Heating RES	0.0000000000	0.000000	10.0		per measure
406675_2022_12	MFIE	Learning Thermostat - Unknown MF**	192.52	Cooling RES	0.0009474181	0.182397	10.0	\$125.00	per measure
406675_2022_12	MFIE	Learning Thermostat - Unknown MF**	182.10	Heating RES	0.0000000000	0.000000	10.0		per measure

RESIDENTIAL HOME ENERGY REPORT

Home Energy Report

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings [1]	End Use	kW Factor	kW	EUL [2]	Inc. Cost	Units
450050_2021_12	SF	Home Energy Report	140.37	Building Shell RES	0.0004660805	0.0654220	5.0	\$0.00	per report

[1] Ameren MO PY21 Evaluation Report, PY2021 HER Program Adjusted Net Annual Savings / Number of Customers Treated)
 37,963 Table 32. Final Adjusted Net Program Savings (MWh)
 270,458 Table 28. Number of Customers Treated
 140.37 Savings per household (kWh)

[2] EUL is 5.0 years; however, the annual energy savings are estimated to decline each year over the 5-year lifetime. The table below shows the estimated annual savings for each year in the measure life.

140.37 First Year Annual kWh
 0.20 Annual Savings Decay

Annual Savings over the 5-Year EUL (for entry to Appendix I)

Year	kWh Annual Savings [1]	Demand Savings
1	140.37	0.065422
2	112.29	0.052337
3	89.83	0.041870
4	71.87	0.033496
5	57.49	0.026797

PAY AS YOU SAVE

Lighting

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_2023_12	PAYS	LED - 8-9W Standard A19 (CFL baseline) (800-900 lumens)	8.90	0.001329	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	8.90	0.00	0.0013	0.0000	19.0	6.0	\$ 1.45	per bulb
450110_2023_12	PAYS	LED - 9.5-10.5W Downlight E26 (CFL baseline) (650-950 lumens)	6.67	0.000995	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.67	0.00	0.0010	0.0000	19.0	6.0	\$ 1.66	per bulb
450120_2023_12	PAYS	LED - 15-20W Exterior Flood Light E26 (CFL baseline) (1,300-2000 lumens)	16.59	0.002477	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	16.59	0.00	0.0025	0.0000	19.0	6.0	\$ 1.66	per bulb
450130_2023_12	PAYS	LED - 4W Candelabra E12 (CFL baseline) (300-350 lumens)	2.76	0.000412	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.76	0.00	0.0004	0.0000	19.0	6.0	\$ 1.66	per bulb
450140_2023_12	PAYS	LED - 4.5-5.5W Globe G25 Bulb (CFL baseline) (400-500 lumens)	4.29	0.000640	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.29	0.00	0.0006	0.0000	19.0	6.0	\$ 1.66	per bulb

*Measure Descriptions with reference to "(CFL baseline)" are in fact aligned to the May 2022 ESA standards putting into effect the 45 lumen/watt backstop provision
 **EUL - BUS based on MO TRM - 20,000 hours total life, 3,951 annual hours of use for average building type.

Water Heater Wrap

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
450200_2023_12	PAYS	Water Heater Wrap SFIE	100.55	Water heating RES	0.0000887318	0.008922	12.0	\$58.00	per measure

Pipe Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
450300_2023_12	PAYS	Pipe Insulation DI	4.83	Water heating RES	0.0000887318	0.000429	12.0	\$7.10	per foot

Low Flow Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
450400_2023_12	PAYS	Low Flow Showerhead SF DI	134.68	Water heating RES	0.0000887318	0.109	0.011950	10.0	\$15.33	per measure
450401_2023_12	PAYS	Low Flow Showerhead MF DI	156.82	Water heating RES	0.0000887318	0.109	0.013915	10.0	\$15.33	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
450500_2023_12	PAYS	Low Flow Bathroom Faucet Aerator SF DI	29.95	Water heating RES	0.0000887318	0.047	0.002658	11.0	\$11.33	per measure
450501_2023_12	PAYS	Low Flow Bathroom Faucet Aerator MF DI	29.95	Water heating RES	0.0000887318	0.047	0.002658	11.0	\$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
450600_2023_12	PAYS	Low Flow Kitchen Faucet Aerator SF DI	94.55	Water Heating RES	0.0000887318	0.079	0.008390	11.0	\$11.33	per measure
450601_2023_12	PAYS	Low Flow Kitchen Faucet Aerator MF DI	94.55	Water Heating RES	0.0000887318	0.079	0.008390	11.0	\$11.33	per measure

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_2023_12	PAYS	Advanced Tier 1 Power Strips DI - Home Office	23.030	Miscellaneous RES	0.0001148238	0.002644	10.0	\$30.00	per measure

RESIDENTIAL MULTI-FAMILY MARKET RATE

AC Tune-up

*MFMRc = Multifamily Market Rate Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
500050_2023_12	MFMR	General Tune-Up (no charge or coil clean) / MFMR	92.29	Cooling RES	0.0009474181	0.087437	2.0	\$70.00	per measure
500051_2023_12	MFMRc	General Tune-Up (no charge or coil clean) / MFMR_CompE	67.12	Cooling RES	0.0009474181	0.063591	2.0	\$70.00	per measure
500100_2023_12	MFMR	AC Tune-up / refrigerant charge / MFMR	384.95	Cooling RES	0.0009474181	0.364709	2.0	\$81.00	per measure
500101_2023_12	MFMRc	AC Tune-up / refrigerant charge / MFMR_CompE	279.96	Cooling RES	0.0009474181	0.265239	2.0	\$81.00	per measure
500150_2023_12	MFMR	Indoor Coil (Evaporator) Cleaning / MFMR	63.71	Cooling RES	0.0009474181	0.060360	2.0	\$63.00	per measure
500151_2023_12	MFMRc	Indoor Coil (Evaporator) Cleaning / MFMR_CompE	46.34	Cooling RES	0.0009474181	0.043903	2.0	\$63.00	per measure
500200_2023_12	MFMR	Outdoor Coil (Condenser) Cleaning / MFMR	127.43	Cooling RES	0.0009474181	0.120729	2.0	\$31.00	per measure
500201_2023_12	MFMRc	Outdoor Coil (Condenser) Cleaning / MFMR_CompE	92.67	Cooling RES	0.0009474181	0.087797	2.0	\$31.00	per measure
500210_2023_12	MFMR	AC Tune-up / Packaged Service / MFMR	239.62	Cooling RES	0.0009474181	0.105069	2.0	\$185.00	per measure
500211_2023_12	MFMRc	AC Tune-up / Packaged Service / MFMR_CompE	174.27	Cooling RES	0.0009474181	0.076419	2.0	\$185.00	per measure

HP Tune-up

*MFMRc = Multifamily Market Rate Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
500230_2023_12	MFMR	HP Tune-up / Packaged Service / MFMR	239.62	Cooling RES	0.0009474181	0.227021	2.0	\$185.00	per measure
500230_2023_12	MFMR	HP Tune-up / Packaged Service / MFMR	768.56	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
500231_2023_12	MFMRc	HP Tune-up / Packaged Service / MFMR_CompE	174.27	Cooling RES	0.0009474181	0.165106	2.0	\$185.00	per measure
500231_2023_12	MFMRc	HP Tune-up / Packaged Service / MFMR_CompE	262.01	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure

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 (ft2)
500250_2019_12	MFMR	Ceiling Insulation R11-R49 MFMR electric furnace base	1.06	Building Shell RES	0.0004660805	1.0	0.10	0.000494	25.0	\$2.12	1.0
500300_2019_12	MFMR	Ceiling Insulation R11-R49 MFMR gas heat and electric cool base	0.53	Building Shell RES	0.0004660805	0.4	0.11	0.000247	25.0	\$2.12	1.0
500350_2019_12	MFMR	Ceiling Insulation R5-R30 MFMR electric furnace base	1.71	Building Shell RES	0.0004660805	1.6	0.16	0.000797	25.0	\$1.16	1.0
500400_2019_12	MFMR	Ceiling Insulation R5-R30 MFMR gas heat and electric cool base	0.86	Building Shell RES	0.0004660805	0.7	0.18	0.000401	25.0	\$1.16	1.0
500450_2019_12	MFMR	Ceiling Insulation R5-R38 MFMR electric furnace base	1.84	Building Shell RES	0.0004660805	1.7	0.17	0.000858	25.0	\$1.68	1.0
500500_2019_12	MFMR	Ceiling Insulation R5-R38 MFMR gas heat and electric cool base	0.93	Building Shell RES	0.0004660805	0.7	0.19	0.000433	25.0	\$1.68	1.0
500550_2019_12	MFMR	Ceiling Insulation R5-R49 MFMR electric furnace base	1.96	Building Shell RES	0.0004660805	1.8	0.19	0.000914	25.0	\$2.57	1.0
500600_2019_12	MFMR	Ceiling Insulation R5-R49 MFMR gas heat and electric cool base	0.99	Building Shell RES	0.0004660805	0.8	0.20	0.000461	25.0	\$2.57	1.0
500650_2019_12	MFMR	Ceiling Insulation R5-R60 MFMR electric furnace base	2.03	Building Shell RES	0.0004660805	1.8	0.19	0.000946	25.0	\$3.42	1.0
500700_2019_12	MFMR	Ceiling Insulation R5-R60 MFMR gas heat and electric cool base	1.02	Building Shell RES	0.0004660805	0.8	0.21	0.000475	25.0	\$3.42	1.0

Dirty Filter Alarm

*MFMRc = Multifamily Market Rate Comprehensive Envelope, CompE = Comprehensive Envelope

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units
500750_2019_12	MFMR	Dirty Filter Alarm_MFMR	79.20	HVAC RES	0.0004660805	50.1	29.1	0.036914	14.0	\$5.00	per measure
500751_2019_12	MFMRc	Dirty Filter Alarm_MFMR_CompE	38.24	HVAC RES	0.0004660805	17.1	21.2	0.017823	14.0	\$5.00	per measure

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
500800_2021_12	MFMR	ECM Auto Fan Early Replacement ER1 (Full Cost) - MFMR	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	6.0	\$74.33	per measure
500800_2021_12	MFMR	ECM Auto Fan Early Replacement ER2 (Remaining Life) - MFMR	0.00	HVAC RES ER2	0.0004660805	0.0	0.0	0.0	0.0	0.000000	0.0		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 430.321(i)). 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

Lighting

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
500850_2023_12	MFMR	LED - 10W (CFL baseline) (750-1049 lumens)	8.49	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	8.5	0.0	0.001267	19.0	6.0	\$2.03	per measure
500900_2019_12	MFMR	LED - 10W (Halogen baseline) (750-1049 lumens)	23.51	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.5	0.0	0.003509	19.0	6.0	\$2.03	per measure
500950_2023_12	MFMR	LED - 12W Dimmable Light Bulb (Replacing CFL)	6.47	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.5	0.0	0.000965	19.0	6.0	\$4.14	per measure
501000_2023_12	MFMR	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent)	6.47	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.5	0.0	0.000965	19.0	6.0	\$4.14	per measure
501050_2019_12	MFMR	LED - 12W (Halogen baseline)	22.87	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	22.9	0.0	0.003413	19.0	6.0	\$4.72	per measure
501100_2023_12	MFMR	LED - 12W (Replacing CFL)	6.47	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.5	0.0	0.000965	19.0	6.0	\$4.72	per measure
501150_2019_12	MFMR	LED - 15W (Halogen baseline) (1050-1489 lumens)	27.69	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.7	0.0	0.004133	19.0	6.0	\$6.27	per measure
501200_2023_12	MFMR	LED - 15W (CFL baseline) (1050-1489 lumens)	11.49	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	11.5	0.0	0.001715	19.0	6.0	\$6.27	per measure
501250_2019_12	MFMR	LED - 20W (Halogen baseline) (1490-2600 lumens)	37.22	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	37.2	0.0	0.005556	19.0	6.0	\$7.83	per measure
501300_2023_12	MFMR	LED - 20W (CFL baseline) (1490-2600 lumens)	19.85	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	19.9	0.0	0.002963	19.0	6.0	\$7.83	per measure
501310_2020_12	MFMR	LED - 11W Flood Light BR30 Bulb (Halogen baseline)	35.26	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	35.3	0.0	0.005263	19.0	6.0	\$1.66	per measure
501311_2023_12	MFMR	LED - 11W Flood Light BR30 Bulb (CFL baseline)	2.61	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.6	0.0	0.000390	19.0	6.0	\$1.66	per measure
501350_2019_12	MFMR	LED - 15W Flood Light PAR30 Bulb (Halogen baseline)	32.85	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	32.8	0.0	0.004903	19.0	6.0	\$3.05	per measure
501400_2023_12	MFMR	LED - 15W Flood Light PAR30 Bulb (CFL baseline)	9.01	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	9.0	0.0	0.001345	19.0	6.0	\$3.05	per measure
501401_2019_12	MFMR	LED - 6W (Halogen baseline) (310-749 lumens)	15.02	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	15.0	0.0	0.002242	19.0	6.0	\$2.03	per measure
501402_2023_12	MFMR	LED - 6W (CFL baseline) (310-749 lumens)	3.79	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.8	0.0	0.000565	19.0	6.0	\$2.03	per measure
501450_2021_12	MFMR	LED Nightlights	27.63	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.6	0.0	0.004125	19.0	6.0	\$3.35	per measure

RESIDENTIAL MULTI-FAMILY MARKET RATE

Faucet Aerators (Kitchen)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
501500_2021_12_	MFMR	Faucet Aerators (Kitchen) MFMR	110.18	Water Heating RES	0.0000887318	0.079	0.009776	10.0	\$8.00	per measure

Faucet Aerators (Bathroom)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
501550_2021_12_	MFMR	Faucet Aerators (Bathroom) MFMR	71.37	Water Heating RES	0.0000887318	0.062	0.006333	10.0	\$8.00	per measure

Low Flow Showerhead

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
501600_2021_12_	MFMR	Low Flow Showerhead MFMR	404.92	Water Heating RES	0.0000887318	0.109	0.035929	10.0	\$7.00	per measure
501601_2023_12_	MFMR	Low Flow Handheld Showerhead MFMR	323.94	Water Heating RES	0.0000887318	0.109	0.035929	10.0	\$23.35	per measure

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
501650_2019_12_	MFMR	Advanced Tier 1 Power Strips / TOS/NC/DI - Home Office	29.45	Miscellaneous RES	0.0001148238	0.003382	10.0	\$20.00	per measure
501700_2019_12_	MFMR	Advanced Tier 1 Power Strips / Kits - Home Office	29.08	Miscellaneous RES	0.0001148238	0.003339	10.0	\$20.00	per measure
501750_2019_12_	MFMR	Advanced Tier 1 Power Strips / TOS/NC/DI - Home Entertainment	71.35	Miscellaneous RES	0.0001148238	0.008193	10.0	\$20.00	per measure
501800_2019_12_	MFMR	Advanced Tier 1 Power Strips / Kits - Home Entertainment	70.44	Miscellaneous RES	0.0001148238	0.008088	10.0	\$20.00	per measure
501850_2019_12_	MFMR	Advanced Tier 1 Power Strips / TOS/NC/DI - Unknown Location	56.26	Miscellaneous RES	0.0001148238	0.006460	10.0	\$20.00	per measure
501900_2019_12_	MFMR	Advanced Tier 1 Power / Kits - Unknown Location	50.59	Miscellaneous RES	0.0001148238	0.005809	10.0	\$20.00	per measure

Advanced Power Strips Tier 2 / Advanced Control Strategies

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
501950_2019_12_	MFMR	Advanced Tier 2 Power Strips - A	237.60	Miscellaneous RES	0.0001148238	0.027282	10.0	\$30.00	per measure
502000_2019_12_	MFMR	Advanced Tier 2 Power Strips - B	216.00	Miscellaneous RES	0.0001148238	0.024802	10.0	\$30.00	per measure
502050_2019_12_	MFMR	Advanced Tier 2 Power Strips - C	194.40	Miscellaneous RES	0.0001148238	0.022322	10.0	\$30.00	per measure
502100_2019_12_	MFMR	Advanced Tier 2 Power Strips - D	172.80	Miscellaneous RES	0.0001148238	0.019842	10.0	\$30.00	per measure
502150_2019_12_	MFMR	Advanced Tier 2 Power Strips - E	151.20	Miscellaneous RES	0.0001148238	0.017361	10.0	\$30.00	per measure
502200_2019_12_	MFMR	Advanced Tier 2 Power Strips - F	129.60	Miscellaneous RES	0.0001148238	0.014881	10.0	\$30.00	per measure
502250_2019_12_	MFMR	Advanced Tier 2 Power Strips - G	108.00	Miscellaneous RES	0.0001148238	0.012401	10.0	\$30.00	per measure
502300_2019_12_	MFMR	Advanced Tier 2 Power Strips - H	86.40	Miscellaneous RES	0.0001148238	0.009921	10.0	\$30.00	per measure
502350_2019_12_	MFMR	Advanced Tier 2 Power Strips / TOS/NC / Average	162.00	Miscellaneous RES	0.0001148238	0.018601	10.0	\$30.00	per measure

High Efficiency Pool Pump

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kWh _h /Day	kWh _h /Day	kWh _h /Day	kW	EUL	Inc. Cost	Units
502400_2021_12_	MFMR	Variable Speed Pool Pump - ROF	315.21	Pool Spa RES	0.0002354459	20.9760	1.58	2.52	0.074215	10.0	\$314.00	per measure
502401_2021_12_	MFMR	Variable Speed Pool Pump - ER	1478.34	Pool Spa RES	0.0002354459	7.1179	14.38	0.39	0.348069	10.0	\$549.00	per measure

Refrigerator

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
502450_2019_12_	MFMR	Refrigerator - early replacement ER1 (full cost) - MFMR	564.66	Refrigeration RES	0.0001285253	0.072573	6.0	\$753.00	per measure
502450_2019_12_	MFMR	Refrigerator - early replacement ER2 (remaining life) - MFMR	46.72	Refrigeration RES ER2	0.0001285253	0.006005	11.0	\$0.00	per measure

RESIDENTIAL APPLIANCE RECYCLING

Refrigerator Recycling

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
550050_2019_12_	Appliance Recycling	Refrigerator recycling (pre-1990)	1020.32	Refrigeration RES	0.0001285253	0.131137	8.0	\$140.00	per measure
550100_2019_12_	Appliance Recycling	Refrigerator recycling (post-1990)	520.00	Refrigeration RES	0.0001285253	0.066833	8.0	\$140.00	per measure

Freezer Recycling

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
550150_2019_12_	Appliance Recycling	Freezer recycling	825.22	Freezer RES	0.0001685722	0.139109	8.0	\$140.00	per measure

Room AC Recycling

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
550200_2019_12_	Appliance Recycling	Room AC recycling - Primary	302.53	Cooling RES	0.0009474181	0.286622	4.0	\$64.89	per measure
550250_2019_12_	Appliance Recycling	Room AC recycling - Secondary	195.59	Cooling RES	0.0009474181	0.185306	4.0	\$64.89	per measure

Dehumidifier Recycling

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
550300_2019_12_	Appliance Recycling	Dehumidifier Recycling	139.00	HVAC RES	0.0004660805	0.064785	5.0	\$42.76	per measure

*EUL assumed to be 33% higher than Room AC EUL, based on TRM values for full equipment life (12 for dehumidifier and 9 for Room AC)

**Cost assumed based on full cost of Dehumidifier equipment (\$230) and ratio of refrigerator recycling cost (\$140) to full refrigerator cost (\$742 + \$11) . Full cost of Dehumidifier is based on an internet search.

RESIDENTIAL DEMAND RESPONSE

Demand Response 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_2020_12_	DR	Summer Demand Response Advanced Thermostat - with Program-driven Optimization	97.49	-	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

[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 PY2022 Final Report
 Optimization Energy Savings Summary, Aggregate: Table 22. Comparison of Savings from Emerson Optimization Using Telemetry and AMI Data Pathways
 Total Number of Devices Enrolled: Table 13. Residential DR Program: Resource Capability Impacts

[Note 3] Gross kWh Annual Savings are calculated as the total aggregate PY2022 energy savings (791.06 MWh) divided by the number of devices active at the end of the 2022 event season (8,114).

[Note 4] 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 5] The kW factor based on end use is not used because the actual demand impacts are directly measured.

[Note 6] 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 0.94 kW/thermostat is assumed based on the PY22 evaluation results; refer to Table 13. Residential DR Program: Resource Capability Impacts for the number of devices and Appendix Table 3 Residential DR Program: Resource Capability Impacts for the AMI per account kW impacts and number of accounts.

[Note 7] Per device kW impact is calculated as the per account kW load impact (1.10) multiplied by the number of accounts (41,084) all divided by the number of devices (50,034).

[Note 8] Winter demand savings are calculated for demand response events. For planning estimates a value of 0.5 kW/thermostat is assumed based on conservative estimates from delivery of a similar program in Indiana, see Shifting Space Conditioning Load: A Smart Thermostat Demand Response Pilot Measurement & Verification (June 2021), retrievable at <https://www.cooperative.com/programs-services/bts/Documents/Reports/Report-Smart-Thermostat-Pilot-June-2021.pdf>

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
600400_2023_12_	DR	Demand Response Water Heater Switch	0.00	-	n/a	-	-	1.0	\$0.00	per unit

[Note 1] The kW factor based on end use is not used because the actual demand impacts are directly measured.

[Note 2] 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 0.2 kW/Water Heater Switch is assumed based on best available information. These values have not been reviewed through evaluation.

[Note 3] Winter demand savings are calculated for demand response events.

Demand Response Electric Vehicle Charger

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
600500_2023_12_	DR	Demand Response Electric Vehicle Charger	0.00	-	n/a	-	-	1.0	\$0.00	per unit

[Note 1] The kW factor based on end use is not used because the actual demand impacts are directly measured.

[Note 2] 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 2 kW/Electric Vehicle Charger is assumed based on best available information. These values have not been reviewed through evaluation.

[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 60%		ROF 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	1,329.22		166.21		1.259327	-	0.157470	-	1,329.22	166.21	1.259327	0.157470			
CAC-SEER15_ROF_SF		350650	1,329.22		166.21		1.259327	-	0.157470	-	1,329.22	166.21	1.259327	0.157470			
CAC-SEER15_ER1_MF		350700	1,085.86		109.05		1.028763	-	0.103316	-	1,085.86	109.05	1.028763	0.103316			
CAC-SEER15_ER1_MF_CompE		350701	789.72		79.31		0.748195	-	0.075140	-	789.72	79.31	0.748195	0.075140			
CAC-SEER15_ROF_MF		350750	1,085.86		109.05		1.028763	-	0.103316	-	1,085.86	109.05	1.028763	0.103316			
CAC-SEER15_ROF_MF_CompE		350751	789.72		79.31		0.748195	-	0.075140	-	789.72	79.31	0.748195	0.075140			
CAC-SEER16_ER1_SF		350800	1,394.28		278.81		1.320966	-	0.264150	-	1,394.28	278.81	1.320966	0.264150			
CAC-SEER16_ROF_SF		350850	1,394.28		278.81		1.320966	-	0.264150	-	1,394.28	278.81	1.320966	0.264150			
CAC-SEER16_ER1_MF		350900	1,204.19		246.05		1.140871	-	0.233112	-	1,204.19	246.05	1.140871	0.233112			
CAC-SEER16_ER1_MF_CompE		350901	875.77		178.94		0.829720	-	0.169531	-	875.77	178.94	0.829720	0.169531			
CAC-SEER16_ROF_MF		350950	1,204.19		246.05		1.140871	-	0.233112	-	1,204.19	246.05	1.140871	0.233112			
CAC-SEER16_ROF_MF_CompE		350951	875.77		178.94		0.829720	-	0.169531	-	875.77	178.94	0.829720	0.169531			
CAC-SEER17_ER1_SF		351000	1,517.35		390.28		1.437565	-	0.369758	-	1,517.35	390.28	1.437565	0.369758			
CAC-SEER17_ROF_SF		351050	1,517.35		390.28		1.437565	-	0.369758	-	1,517.35	390.28	1.437565	0.369758			
CAC-SEER17_ER1_MF		351100	1,306.27		340.75		1.237584	-	0.322833	-	1,306.27	340.75	1.237584	0.322833			
CAC-SEER17_ER1_MF_CompE		351101	950.01		247.81		0.900057	-	0.234780	-	950.01	247.81	0.900057	0.234780			
CAC-SEER17_ROF_MF		351150	1,306.27		340.75		1.237584	-	0.322833	-	1,306.27	340.75	1.237584	0.322833			
CAC-SEER17_ROF_MF_CompE		351151	950.01		247.81		0.900057	-	0.234780	-	950.01	247.81	0.900057	0.234780			
CAC-SEER18_ER1_SF		351160	1,735.24		555.21		1.643998	-	0.526016	-	1,735.24	555.21	1.643998	0.526016			
CAC-SEER18_ROF_SF		351161	1,735.24		555.21		1.643998	-	0.526016	-	1,735.24	555.21	1.643998	0.526016			
CAC-SEER18_ER1_MF		351162	1,409.35		379.94		1.335244	-	0.359962	-	1,409.35	379.94	1.335244	0.359962			
CAC-SEER18_ER1_MF_CompE		351163	828.31		276.32		0.784756	-	0.261791	-	828.31	276.32	0.784756	0.261791			
CAC-SEER18_ROF_MF		351164	1,409.35		379.94		1.335244	-	0.359962	-	1,409.35	379.94	1.335244	0.359962			
CAC-SEER18_ROF_MF_CompE		351165	828.31		276.32		0.784756	-	0.261791	-	828.31	276.32	0.784756	0.261791			
CAC-SEER19_ER1_SF		351170	2,422.33		856.37		2.294959	-	0.811340	-	2,422.33	856.37	2.294959	0.811340			
CAC-SEER19_ROF_SF		351171	2,422.33		856.37		2.294959	-	0.811340	-	2,422.33	856.37	2.294959	0.811340			
CAC-SEER19_ER1_MF		351172	998.44		391.25		0.945940	-	0.370677	-	998.44	391.25	0.945940	0.370677			
CAC-SEER19_ER1_MF_CompE		351173	726.13		284.54		0.687949	-	0.269578	-	726.13	284.54	0.687949	0.269578			
CAC-SEER19_ROF_MF		351174	998.44		391.25		0.945940	-	0.370677	-	998.44	391.25	0.945940	0.370677			
CAC-SEER19_ROF_MF_CompE		351175	726.13		284.54		0.687949	-	0.269578	-	726.13	284.54	0.687949	0.269578			
CAC-SEER20_ER1_SF		351180	1,914.99		723.88		1.814296	-	0.685817	-	1,914.99	723.88	1.814296	0.685817			
CAC-SEER20_ROF_SF		351181	1,914.99		723.88		1.814296	-	0.685817	-	1,914.99	723.88	1.814296	0.685817			
CAC-SEER20_ER1_MF		351182	1,040.27		446.02		0.985571	-	0.422567	-	1,040.27	446.02	0.985571	0.422567			
CAC-SEER20_ER1_MF_CompE		351183	765.97		324.38		0.725694	-	0.307323	-	765.97	324.38	0.725694	0.307323			
CAC-SEER20_ROF_MF		351184	1,040.27		446.02		0.985571	-	0.422567	-	1,040.27	446.02	0.985571	0.422567			
CAC-SEER20_ROF_MF_CompE		351185	765.97		324.38		0.725694	-	0.307323	-	765.97	324.38	0.725694	0.307323			
CAC-SEER21+_ER1_SF		351190	1,998.76		924.16		1.893661	-	0.875566	-	1,998.76	924.16	1.893661	0.875566			
CAC-SEER21+_ROF_SF		351191	1,998.76		924.16		1.893661	-	0.875566	-	1,998.76	924.16	1.893661	0.875566			
CAC-SEER21+_ER1_MF		351192	1,102.77		495.58		1.102777	-	0.469521	-	1,102.77	495.58	1.102777	0.469521			
CAC-SEER21+_ER1_MF_CompE		351193	802.01		360.42		0.759839	-	0.341468	-	802.01	360.42	0.759839	0.341468			
CAC-SEER21+_ROF_MF		351194	1,102.77		495.58		1.102777	-	0.469521	-	1,102.77	495.58	1.102777	0.469521			
CAC-SEER21+_ROF_MF_CompE		351195	802.01		360.42		0.759839	-	0.341468	-	802.01	360.42	0.759839	0.341468			
Mini/MultiSplitAC_ER1_SF		351200	822.17		253.91		0.778939	-	0.240559	-	822.17	253.91	0.778939	0.240559			
Mini/MultiSplitAC_ROF_SF		351250	822.17		253.91		0.778939	-	0.240559	-	822.17	253.91	0.778939	0.240559			

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 60% ROF 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			
Mini/MultiSplitASHP_ROF_SF_NC		351300	679.85	1,547.46	380.31	1,102.72	0.644102	-	0.360313	-	2,227.31	1,483.03	0.644102	0.360313			
Mini/MultiSplitASHP_ROF_SF		351350	679.85	1,547.46	380.31	1,102.72	0.644102	-	0.360313	-	2,227.31	1,483.03	0.644102	0.360313			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_SF		351400	701.19	4,501.71	303.34	4,501.71	0.664320	-	0.287390	-	5,202.90	4,805.05	0.664320	0.287390			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_SF		351401	701.19	-	303.34	-	0.664320	-	0.287390	-	701.19	303.34	0.664320	0.287390			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_SF		351450	701.19	4,501.71	303.34	4,501.71	0.664320	-	0.287390	-	5,202.90	4,805.05	0.664320	0.287390			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_SF		351451	701.19	-	303.34	-	0.664320	-	0.287390	-	701.19	303.34	0.664320	0.287390			
Mini/MultiSplitASHP_ER1_SF		351500	679.85	1,547.46	380.31	1,102.72	0.644102	-	0.360313	-	2,227.31	1,483.03	0.644102	0.360313			
Mini/MultiSplitAC_ER1_MF		351550	1,004.15	-	354.71	-	0.951350	-	0.336059	-	1,004.15	354.71	0.951350	0.336059			
Mini/MultiSplitAC_ER1_MF_CompE		351551	1,002.63	-	576.15	-	0.949910	-	0.545855	-	1,002.63	576.15	0.949910	0.545855			
Mini/MultiSplitAC_ROF_MF		351600	1,004.15	-	354.71	-	0.951350	-	0.336059	-	1,004.15	354.71	0.951350	0.336059			
Mini/MultiSplitAC_ROF_MF_CompE		351601	1,002.63	-	576.15	-	0.949910	-	0.545855	-	1,002.63	576.15	0.949910	0.545855			
Mini/MultiSplitASHP_ROF_MF_NC		351650	785.99	1,693.76	229.09	1,021.66	0.744661	-	0.217044	-	2,479.75	1,250.75	0.744661	0.217044			
Mini/MultiSplitASHP-Replace_CAC_ER1_MF_CompE		351651	516.15	643.76	150.43	463.52	0.489010	-	0.142520	-	1,159.91	613.95	0.489010	0.142520			
Mini/MultiSplitASHP_ROF_MF		351700	785.99	1,693.76	229.09	1,021.66	0.744661	-	0.217044	-	2,479.75	1,250.75	0.744661	0.217044			
Mini/MultiSplitASHP_ROF_MF_CompE		351701	516.15	643.76	150.43	463.52	0.489010	-	0.142520	-	1,159.91	613.95	0.489010	0.142520			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF		351750	800.60	4,721.55	287.24	4,721.55	0.758503	-	0.272136	-	5,522.15	5,008.79	0.758503	0.272136			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ER1_MF_CompE		351751	525.75	1,929.13	188.63	1,929.13	0.498105	-	0.178711	-	2,454.88	2,117.76	0.498105	0.178711			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF		351752	736.09	-	287.24	-	0.697385	-	0.272136	-	736.09	287.24	0.697385	0.272136			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ER1_MF_CompE		351753	525.75	-	188.63	-	0.498105	-	0.178711	-	525.75	188.63	0.498105	0.178711			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF		351800	800.60	4,721.55	287.24	4,721.55	0.758503	-	0.272136	-	5,522.15	5,008.79	0.758503	0.272136			
Mini/MultiSplitASHP-Replace_CAC_ElectricHeat_ROF_MF_CompE		351801	525.75	1,929.13	188.63	1,929.13	0.498105	-	0.178711	-	2,454.88	2,117.76	0.498105	0.178711			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF		351802	736.09	-	287.24	-	0.697385	-	0.272136	-	736.09	287.24	0.697385	0.272136			
Mini/MultiSplitASHP-Replace_CAC_NonElectricHeat_ROF_MF_CompE		351803	525.75	-	188.63	-	0.498105	-	0.178711	-	525.75	188.63	0.498105	0.178711			
Mini/MultiSplitASHP_ER1_MF		351850	785.99	1,693.76	229.09	1,021.66	0.744661	-	0.217044	-	2,479.75	1,250.75	0.744661	0.217044			
Mini/MultiSplitASHP_ER1_MF_CompE		351851	516.15	643.76	150.43	463.52	0.489010	-	0.142520	-	1,159.91	613.95	0.489010	0.142520			
DFHP-SEER19-ROF_MF		351900	323.45	483.10	-	-	0.306442	-	-	-	806.55	-	0.306442	-			
DFHP-SEER19-ROF_MF_CompE		351901	235.24	220.18	-	-	0.222871	-	-	-	455.42	-	0.222871	-			
DFHP-SEER20-ROF_MF		351950	497.07	772.89	-	-	0.470933	-	-	-	1,269.96	-	0.470933	-			
DFHP-SEER20-ROF_MF_CompE		351951	361.50	352.26	-	-	0.342492	-	-	-	713.76	-	0.342492	-			
DFHP-SEER21-ROF_MF		352000	697.19	1,116.40	-	-	0.660530	-	-	-	1,813.59	-	0.660530	-			
DFHP-SEER21-ROF_MF_CompE		352001	507.04	508.81	-	-	0.480379	-	-	-	1,015.85	-	0.480379	-			
GSHP-EER23-Replace_CAC_ElectricHeat_ROF_SF		352050	3,601.51	15,960.03	1,500.13	15,960.03	3.412136	-	1.421250	-	19,561.54	17,460.16	3.412136	1.421250			
GSHP-EER23-Replace_CAC_ElectricHeat_ER1_SF		352100	3,601.51	15,960.03	1,500.13	15,960.03	3.412136	-	1.421250	-	19,561.54	17,460.16	3.412136	1.421250			
GSHP-EER23_ER1_SF		352200	2,775.85	2,424.75	1,500.13	1,999.83	2.629891	-	1.421250	-	5,200.60	3,499.96	2.629891	1.421250			
GSHP-EER23_ROF_SF		352250	2,775.85	2,424.75	1,500.13	1,999.83	2.629891	-	1.421250	-	5,200.60	3,499.96	2.629891	1.421250			
ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_SF		352300	1,271.17	8,563.13	168.36	8,563.13	1.204329	-	0.159507	-	9,834.30	8,731.49	1.204329	0.159507			
ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_SF		352310	1,271.17	-	168.36	-	1.204329	-	0.159507	-	1,271.17	168.36	1.204329	0.159507			
ASHP-SEER15_ER1_SF		352350	1,210.28	1,082.26	18.13	93.09	1.146641	-	0.017177	-	2,292.54	111.22	1.146641	0.017177			
ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_SF		352400	1,271.17	8,563.13	168.36	8,563.13	1.204329	-	0.159507	-	9,834.30	8,731.49	1.204329	0.159507			
ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_SF		352410	1,271.17	-	168.36	-	1.204329	-	0.159507	-	1,271.17	168.36	1.204329	0.159507			
ASHP-SEER15_ROF_SF		352450	1,210.28	1,082.26	18.13	93.09	1.146641	-	0.017177	-	2,292.54	111.22	1.146641	0.017177			
ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_SF		352500	1,335.75	8,676.99	284.91	8,676.99	1.265514	-	0.269929	-	10,012.74	8,961.90	1.265514	0.269929			
ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_SF		352510	1,335.75	-	284.91	-	1.265514	-	0.269929	-	1,335.75	284.91	1.265514	0.269929			
ASHP-SEER16_ER1_SF		352550	1,274.69	1,253.81	136.13	280.64	1.207664	-	0.128972	-	2,528.50	416.77	1.207664	0.128972			

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 60% ROF 40%				Weighted Average				Weighted Average				Weighted Average Total			
		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				
MEASURE NAME	ID																
ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_SF	352600	1,335.75	8,676.99	284.91	8,676.99	1.265514	-	0.269929	-	10,012.74	8,961.90	1.265514	0.269929				
ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_SF	352610	1,335.75	-	284.91	-	1.265514	-	0.269929	-	1,335.75	284.91	1.265514	0.269929				
ASHP-SEER16_ROF_SF	352650	1,274.69	1,253.81	136.13	280.64	1.207664	-	0.128972	-	2,528.50	416.77	1.207664	0.128972				
ASHP-SEER15_ER1_MF	352700	1,424.63	1,423.54	4.57	280.30	1.349720	-	0.004330	-	2,848.17	284.87	1.349720	0.004330				
ASHP-SEER15_ER1_MF_CompE	352701	1,036.10	485.30	3.32	95.56	0.981620	-	0.003145	-	1,521.40	98.88	0.981620	0.003145				
ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF	352750	1,474.29	8,701.40	152.55	8,701.40	1.396769	-	0.144529	-	10,175.69	8,853.95	1.396769	0.144529				
ASHP-SEER15-Replace_CAC_ElectricHeat_ER1_MF_CompE	352751	1,072.21	2,966.39	110.95	2,966.39	1.015831	-	0.105116	-	4,038.60	3,077.34	1.015831	0.105116				
ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF	352760	1,474.29	-	152.55	-	1.396769	-	0.144529	-	1,474.29	152.55	1.396769	0.144529				
ASHP-SEER15-Replace_CAC_NonElectricHeat_ER1_MF_CompE	352761	1,072.21	-	110.95	-	1.015831	-	0.105116	-	1,072.21	110.95	1.015831	0.105116				
ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF	352800	1,474.29	8,701.40	152.55	8,701.40	1.396769	-	0.144529	-	10,175.69	8,853.95	1.396769	0.144529				
ASHP-SEER15-Replace_CAC_ElectricHeat_ROF_MF_CompE	352801	1,072.21	2,966.39	110.95	2,966.39	1.015831	-	0.105116	-	4,038.60	3,077.34	1.015831	0.105116				
ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF	352810	1,474.29	-	152.55	-	1.396769	-	0.144529	-	1,474.29	152.55	1.396769	0.144529				
ASHP-SEER15-Replace_CAC_NonElectricHeat_ROF_MF_CompE	352811	1,072.21	-	110.95	-	1.015831	-	0.105116	-	1,072.21	110.95	1.015831	0.105116				
ASHP-SEER16_ER1_MF	352850	1,292.08	1,430.22	121.66	338.68	1.224140	-	0.115263	-	2,722.30	460.34	1.224140	0.115263				
ASHP-SEER16_ER1_MF_CompE	352851	939.69	487.57	88.48	115.46	0.890279	-	0.083828	-	1,427.26	203.94	0.890279	0.083828				
ASHP-SEER16_ROF_MF	352900	1,292.08	1,430.22	121.66	338.68	1.224140	-	0.115263	-	2,722.30	460.34	1.224140	0.115263				
ASHP-SEER16_ROF_MF_CompE	352901	939.69	487.57	88.48	115.46	0.890279	-	0.083828	-	1,427.26	203.94	0.890279	0.083828				
ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF	352950	1,336.77	8,588.48	260.70	8,588.48	1.266480	-	0.246992	-	9,925.25	8,849.18	1.266480	0.246992				
ASHP-SEER16-Replace_CAC_ElectricHeat_ROF_MF_CompE	352951	972.19	2,927.89	189.60	2,927.89	0.921070	-	0.179630	-	3,900.08	3,117.49	0.921070	0.179630				
ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF	352960	1,336.77	-	260.70	-	1.266480	-	0.246992	-	1,336.77	260.70	1.266480	0.246992				
ASHP-SEER16-Replace_CAC_NonElectricHeat_ROF_MF_CompE	352961	972.19	-	189.60	-	0.921070	-	0.179630	-	972.19	189.60	0.921070	0.179630				
ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF	353000	1,336.77	8,588.48	260.70	8,588.48	1.266480	-	0.246992	-	9,925.25	8,849.18	1.266480	0.246992				
ASHP-SEER16-Replace_CAC_ElectricHeat_ER1_MF_CompE	353001	972.19	2,927.89	189.60	2,927.89	0.921070	-	0.179630	-	3,900.08	3,117.49	0.921070	0.179630				
ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF	353010	1,336.77	-	260.70	-	1.266480	-	0.246992	-	1,336.77	260.70	1.266480	0.246992				
ASHP-SEER16-Replace_CAC_NonElectricHeat_ER1_MF_CompE	353011	972.19	-	189.60	-	0.921070	-	0.179630	-	972.19	189.60	0.921070	0.179630				
ASHP-SEER15_ROF_MF	353050	1,424.63	1,423.54	4.57	280.30	1.349720	-	0.004330	-	2,848.17	284.87	1.349720	0.004330				
ASHP-SEER15_ROF_MF_CompE	353051	1,036.10	485.30	3.32	95.56	0.981620	-	0.003145	-	1,521.40	98.88	0.981620	0.003145				
ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_SF	353100	1,535.84	9,694.92	432.52	9,694.92	1.455083	-	0.409777	-	11,230.76	10,127.44	1.455083	0.409777				
ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_SF	353110	1,535.84	-	432.52	-	1.455083	-	0.409777	-	1,535.84	432.52	1.455083	0.409777				
ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF	353150	867.57	6,541.11	254.61	6,541.11	0.821952	-	0.241222	-	7,408.68	6,795.72	0.821952	0.241222				
ASHP-SEER17-Replace_CAC_ElectricHeat_ROF_MF_CompE	353151	630.97	2,229.92	185.17	2,229.92	0.597792	-	0.175433	-	2,860.89	2,415.09	0.597792	0.175433				
ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF	353160	867.57	-	254.61	-	0.821952	-	0.241222	-	867.57	254.61	0.821952	0.241222				
ASHP-SEER17-Replace_CAC_NonElectricHeat_ROF_MF_CompE	353161	630.97	-	185.17	-	0.597792	-	0.175433	-	630.97	185.17	0.597792	0.175433				
ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_SF	353200	1,613.49	10,174.02	517.05	10,174.02	1.528650	-	0.489863	-	11,787.51	10,691.07	1.528650	0.489863				
ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_SF	353210	1,613.49	-	517.05	-	1.528650	-	0.489863	-	1,613.49	517.05	1.528650	0.489863				
ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF	353250	1,409.74	7,172.18	347.60	7,172.18	1.335613	-	0.329323	-	8,581.92	7,519.78	1.335613	0.329323				
ASHP-SEER18-Replace_CAC_ElectricHeat_ROF_MF_CompE	353251	584.66	2,445.06	252.80	2,445.06	0.553917	-	0.239507	-	3,029.72	2,697.86	0.553917	0.239507				
ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF	353260	1,409.74	-	347.60	-	1.335613	-	0.329323	-	1,409.74	347.60	1.335613	0.329323				
ASHP-SEER18-Replace_CAC_NonElectricHeat_ROF_MF_CompE	353261	584.66	-	252.80	-	0.553917	-	0.239507	-	584.66	252.80	0.553917	0.239507				
ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_SF	353300	1,883.45	12,063.70	716.16	12,063.70	1.784415	-	0.678503	-	13,947.15	12,779.86	1.784415	0.678503				
ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_SF	353310	1,883.45	-	716.16	-	1.784415	-	0.678503	-	1,883.45	716.16	1.784415	0.678503				
ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF	353350	1,002.89	6,541.11	389.93	6,541.11	0.950156	-	0.369427	-	7,544.00	6,931.04	0.950156	0.369427				
ASHP-SEER19-Replace_CAC_ElectricHeat_ROF_MF_CompE	353351	721.92	2,229.92	276.13	2,229.92	0.683960	-	0.261611	-	2,951.84	2,506.05	0.683960	0.261611				
ASHP-SEER19-Replace_CAC_NonElectricHeat_ROF_MF	353360	1,002.89	-	389.93	-	0.950156	-	0.369427	-	1,002.89	389.93	0.950156	0.369427				

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 60%				ROF 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_MF_CompE	353361	721.92	-	276.13	-	0.683960	-	0.261611	-	721.92	276.13	0.683960	0.261611		
ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_SF	353400	1,827.72	9,561.65	717.77	9,561.65	1.731615	-	0.680028	-	11,389.37	10,279.42	1.731615	0.680028		
ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_SF	353410	1,827.72	-	717.77	-	1.731615	-	0.680028	-	1,827.72	717.77	1.731615	0.680028		
ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_SF	353450	1,827.72	9,561.65	717.77	9,561.65	1.731615	-	0.680028	-	11,389.37	10,279.42	1.731615	0.680028		
ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_SF	353460	1,827.72	-	717.77	-	1.731615	-	0.680028	-	1,827.72	717.77	1.731615	0.680028		
ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF	353500	1,069.04	6,896.14	456.08	6,896.14	1.012828	-	0.432098	-	7,965.18	7,352.22	1.012828	0.432098		
ASHP-SEER20-Replace_CAC_ElectricHeat_ROF_MF_CompE	353501	777.49	2,350.96	331.69	2,350.96	0.736608	-	0.314249	-	3,128.45	2,682.65	0.736608	0.314249		
ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF	353510	1,069.04	-	456.08	-	1.012828	-	0.432098	-	1,069.04	456.08	1.012828	0.432098		
ASHP-SEER20-Replace_CAC_NonElectricHeat_ROF_MF_CompE	353511	777.49	-	331.69	-	0.736608	-	0.314249	-	777.49	331.69	0.736608	0.314249		
ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_SF	353550	2,021.11	12,171.69	935.35	12,171.69	1.914836	-	0.886168	-	14,192.80	13,107.04	1.914836	0.886168		
ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_SF	353560	2,021.11	-	935.35	-	1.914836	-	0.886168	-	2,021.11	935.35	1.914836	0.886168		
ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF	353600	1,093.90	6,541.11	480.93	6,541.11	1.036381	-	0.455642	-	7,635.01	7,022.04	1.036381	0.455642		
ASHP-SEER21-Replace_CAC_ElectricHeat_ER1_MF_CompE	353601	795.56	2,229.92	349.77	2,229.92	0.753728	-	0.331378	-	3,025.48	2,579.69	0.753728	0.331378		
ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF	353610	1,093.90	-	480.93	-	1.036381	-	0.455642	-	1,093.90	480.93	1.036381	0.455642		
ASHP-SEER21-Replace_CAC_NonElectricHeat_ER1_MF_CompE	353611	795.56	-	349.77	-	0.753728	-	0.331378	-	795.56	349.77	0.753728	0.331378		
ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_SF	353650	2,021.11	12,171.69	935.35	12,171.69	1.914836	-	0.886168	-	14,192.80	13,107.04	1.914836	0.886168		
ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_SF	353660	2,021.11	-	935.35	-	1.914836	-	0.886168	-	2,021.11	935.35	1.914836	0.886168		
ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF	353700	516.43	7,100.69	516.43	7,100.69	0.489275	-	0.489275	-	7,617.12	7,617.12	0.489275	0.489275		
ASHP-SEER21+-Replace_CAC_ElectricHeat_ROF_MF_CompE	353701	375.59	2,420.69	375.59	2,420.69	0.355841	-	0.355841	-	2,796.28	2,796.28	0.355841	0.355841		
ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF	353710	516.43	-	516.43	-	0.489275	-	0.489275	-	516.43	516.43	0.489275	0.489275		
ASHP-SEER21+-Replace_CAC_NonElectricHeat_ROF_MF_CompE	353711	375.59	-	375.59	-	0.355841	-	0.355841	-	375.59	375.59	0.355841	0.355841		
ASHP-SEER17_ER1_SF	353750	1,474.26	1,564.60	278.06	541.70	1.396741	-	0.263439	-	3,038.86	819.76	1.396741	0.263439		
ASHP-SEER17_ROF_SF	353800	1,474.26	1,564.60	278.06	541.70	1.396741	-	0.263439	-	3,038.86	819.76	1.396741	0.263439		
ASHP-SEER18_ER1_SF	353850	1,554.27	1,957.85	363.09	845.85	1.472544	-	0.343998	-	3,512.12	1,208.94	1.472544	0.343998		
ASHP-SEER18_ROF_SF	353950	1,554.27	1,957.85	363.09	845.85	1.472544	-	0.343998	-	3,512.12	1,208.94	1.472544	0.343998		
ASHP-SEER19_ER1_SF	354000	1,815.45	2,519.60	540.65	1,068.85	1.719990	-	0.512222	-	4,335.05	1,609.50	1.719990	0.512222		
ASHP-SEER19_ROF_SF	354050	1,815.45	2,519.60	540.65	1,068.85	1.719990	-	0.512222	-	4,335.05	1,609.50	1.719990	0.512222		
ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_SF	354100	1,535.84	9,694.92	432.52	9,694.92	1.455083	-	0.409777	-	11,230.76	10,127.44	1.455083	0.409777		
ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_SF	354110	1,535.84	-	432.52	-	1.455083	-	0.409777	-	1,535.84	432.52	1.455083	0.409777		
ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF	354150	867.57	6,541.11	254.61	6,541.11	0.821952	-	0.241222	-	7,408.68	6,795.72	0.821952	0.241222		
ASHP-SEER17-Replace_CAC_ElectricHeat_ER1_MF_CompE	354151	630.97	2,229.92	185.17	2,229.92	0.597792	-	0.175433	-	2,860.89	2,415.09	0.597792	0.175433		
ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF	354160	867.57	-	254.61	-	0.821952	-	0.241222	-	867.57	254.61	0.821952	0.241222		
ASHP-SEER17-Replace_CAC_NonElectricHeat_ER1_MF_CompE	354161	630.97	-	185.17	-	0.597792	-	0.175433	-	630.97	185.17	0.597792	0.175433		
ASHP-SEER17_ER1_MF	354200	891.86	1,298.56	175.44	473.82	0.844964	-	0.166215	-	2,190.42	649.26	0.844964	0.166215		
ASHP-SEER17_ER1_MF_CompE	354201	648.62	442.69	127.59	161.53	0.614514	-	0.120881	-	1,091.31	289.12	0.614514	0.120881		
ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_SF	354250	1,613.49	10,174.02	517.05	10,174.02	1.528650	-	0.489863	-	11,787.51	10,691.07	1.528650	0.489863		
ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_SF	354260	1,613.49	-	517.05	-	1.528650	-	0.489863	-	1,613.49	517.05	1.528650	0.489863		
ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF	354300	1,409.74	7,172.18	347.60	7,172.18	1.335613	-	0.329323	-	8,581.92	7,519.78	1.335613	0.329323		
ASHP-SEER18-Replace_CAC_ElectricHeat_ER1_MF_CompE	354301	584.66	2,445.06	252.80	2,445.06	0.553917	-	0.239507	-	3,029.72	2,697.86	0.553917	0.239507		
ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF	354310	1,409.74	-	347.60	-	1.335613	-	0.329323	-	1,409.74	347.60	1.335613	0.329323		
ASHP-SEER18-Replace_CAC_NonElectricHeat_ER1_MF_CompE	354311	584.66	-	252.80	-	0.553917	-	0.239507	-	584.66	252.80	0.553917	0.239507		
ASHP-SEER18_ER1_MF	354350	1,578.27	1,618.91	273.21	657.67	1.495282	-	0.258844	-	3,197.18	930.88	1.495282	0.258844		
ASHP-SEER18_ER1_MF_CompE	354351	1,147.84	551.90	198.70	224.21	1.087484	-	0.188252	-	1,699.74	422.91	1.087484	0.188252		
ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_SF	354400	1,883.45	12,063.70	716.16	12,063.70	1.784415	-	0.678503	-	13,947.15	12,779.86	1.784415	0.678503		

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 60% ROF 40%				Weighted Average				Weighted Average				Weighted Average Total			
		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				
MEASURE NAME	ID																
ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_SF	354410	1,883.45	-	716.16	-	1.784415	-	0.678503	-	1,883.45	716.16	1.784415	0.678503				
ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF	354450	1,002.89	6,541.11	389.93	6,541.11	0.950156	-	0.369427	-	7,544.00	6,931.04	0.950156	0.369427				
ASHP-SEER19-Replace_CAC_ElectricHeat_ER1_MF_CompE	354451	721.92	2,229.92	276.13	2,229.92	0.683960	-	0.261611	-	2,951.84	2,506.05	0.683960	0.261611				
ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF	354460	1,002.89	-	389.93	-	0.950156	-	0.369427	-	1,002.89	389.93	0.950156	0.369427				
ASHP-SEER19-Replace_CAC_NonElectricHeat_ER1_MF_CompE	354461	721.92	-	276.13	-	0.683960	-	0.261611	-	721.92	276.13	0.683960	0.261611				
ASHP-SEER19_ER1_MF	354500	1,030.36	1,298.56	313.94	473.82	0.976182	-	0.297432	-	2,328.92	787.76	0.976182	0.297432				
ASHP-SEER19_ER1_MF_CompE	354501	749.35	442.69	228.32	161.53	0.709948	-	0.216315	-	1,192.04	389.85	0.709948	0.216315				
ASHP-SEER20_ER1_SF	354550	1,764.58	1,961.42	559.46	968.14	1.671795	-	0.530043	-	3,726.00	1,527.60	1.671795	0.530043				
ASHP-SEER20_ROF_SF	354600	1,764.58	1,961.42	559.46	968.14	1.671795	-	0.530043	-	3,726.00	1,527.60	1.671795	0.530043				
ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF	354650	1,069.04	6,896.14	456.08	6,896.14	1.012828	-	0.432098	-	7,965.18	7,352.22	1.012828	0.432098				
ASHP-SEER20-Replace_CAC_ElectricHeat_ER1_MF_CompE	354651	777.49	2,350.96	331.69	2,350.96	0.736608	-	0.314249	-	3,128.45	2,682.65	0.736608	0.314249				
ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF	354660	1,069.04	-	456.08	-	1.012828	-	0.432098	-	1,069.04	456.08	1.012828	0.432098				
ASHP-SEER20-Replace_CAC_NonElectricHeat_ER1_MF_CompE	354661	777.49	-	331.69	-	0.736608	-	0.314249	-	777.49	331.69	0.736608	0.314249				
ASHP-SEER20_ER1_MF	354700	1,089.22	1,298.56	372.80	473.82	1.031947	-	0.353197	-	2,387.78	846.62	1.031947	0.353197				
ASHP-SEER20_ER1_MF_CompE	354701	792.16	442.69	271.13	161.53	0.750507	-	0.256873	-	1,234.85	432.66	0.750507	0.256873				
ASHP-SEER21_ER1_SF	354750	1,946.18	2,673.15	759.08	1,387.38	1.843846	-	0.719166	-	4,619.33	2,146.46	1.843846	0.719166				
ASHP-SEER21_ROF_SF	354800	1,946.18	2,673.15	759.08	1,387.38	1.843846	-	0.719166	-	4,619.33	2,146.46	1.843846	0.719166				
ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF	354850	1,093.90	6,541.11	480.93	6,541.11	1.036381	-	0.455642	-	7,635.01	7,022.04	1.036381	0.455642				
ASHP-SEER21-Replace_CAC_ElectricHeat_ROF_MF_CompE	354851	795.56	2,229.92	349.77	2,229.92	0.753728	-	0.331378	-	3,025.48	2,579.69	0.753728	0.331378				
ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF	354860	1,093.90	-	480.93	-	1.036381	-	0.455642	-	1,093.90	480.93	1.036381	0.455642				
ASHP-SEER21-Replace_CAC_NonElectricHeat_ROF_MF_CompE	354861	795.56	-	349.77	-	0.753728	-	0.331378	-	795.56	349.77	0.753728	0.331378				
ASHP-SEER21_ER1_MF	354900	1,142.48	1,298.56	426.06	473.82	1.082406	-	0.403657	-	2,441.04	899.88	1.082406	0.403657				
ASHP-SEER21_ER1_MF_CompE	354901	830.89	442.69	309.86	161.53	0.787200	-	0.293567	-	1,273.58	471.39	0.787200	0.293567				
ASHP-SEER17_ROF_MF	354950	891.86	1,298.56	175.44	473.82	0.844964	-	0.166215	-	2,190.42	649.26	0.844964	0.166215				
ASHP-SEER17_ROF_MF_CompE	354951	648.62	442.69	127.59	161.53	0.614514	-	0.120881	-	1,091.31	289.12	0.614514	0.120881				
ASHP-SEER18_ROF_MF	355000	1,578.27	1,618.91	273.21	657.67	1.495282	-	0.258844	-	3,197.18	930.88	1.495282	0.258844				
ASHP-SEER18_ROF_MF_CompE	355001	1,147.84	551.90	198.70	224.21	1.087484	-	0.188252	-	1,699.74	422.91	1.087484	0.188252				
ASHP-SEER19_ROF_MF	355050	1,030.36	1,298.56	313.94	473.82	0.976182	-	0.297432	-	2,328.92	787.76	0.976182	0.297432				
ASHP-SEER19_ROF_MF_CompE	355051	749.35	442.69	228.32	161.53	0.709948	-	0.216315	-	1,192.04	389.85	0.709948	0.216315				
ASHP-SEER20_ROF_MF	355100	1,089.22	1,298.56	372.80	473.82	1.031947	-	0.353197	-	2,387.78	846.62	1.031947	0.353197				
ASHP-SEER20_ROF_MF_CompE	355101	792.16	442.69	271.13	161.53	0.750507	-	0.256873	-	1,234.85	432.66	0.750507	0.256873				
ASHP-SEER21_ROF_MF	355150	1,142.48	1,298.56	426.06	473.82	1.082406	-	0.403657	-	2,441.04	899.88	1.082406	0.403657				
ASHP-SEER21_ROF_MF_CompE	355151	830.89	442.69	309.86	161.53	0.787200	-	0.293567	-	1,273.58	471.39	0.787200	0.293567				
PTHP-SEER12-ER1_MF	356200	255.94	782.78	16.00	112.08	0.242482	-	0.015159	-	1,038.72	128.08	0.242482	0.015159				
PTHP-SEER12-ER1_MF_CompE	356225	186.25	267.20	11.64	38.26	0.176457	-	0.011028	-	453.45	49.90	0.176457	0.011028				
PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF	356250	292.64	2,610.79	16.00	2,610.79	0.277252	-	0.015159	-	2,903.43	2,626.79	0.277252	0.015159				
PTHP-SEER12-Replace_PTAC_ElectricHeat_ER1_MF_CompE	356275	212.96	891.18	11.64	891.18	0.201762	-	0.011028	-	1,104.14	902.82	0.201762	0.011028				
PTHP-SEER12-ROF_MF	356300	255.94	782.78	16.00	112.08	0.242482	-	0.015159	-	1,038.72	128.08	0.242482	0.015159				
PTHP-SEER12-ROF_MF_CompE	356325	186.25	267.20	11.64	38.26	0.176457	-	0.011028	-	453.45	49.90	0.176457	0.011028				
PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF	356350	292.64	2,610.79	16.00	2,610.79	0.277252	-	0.015159	-	2,903.43	2,626.79	0.277252	0.015159				
PTHP-SEER12-Replace_PTAC_ElectricHeat_ROF_MF_CompE	356375	212.96	891.18	11.64	891.18	0.201762	-	0.011028	-	1,104.14	902.82	0.201762	0.011028				
PTHP-SEER13-ER1_MF	356400	303.93	801.28	63.99	130.58	0.287949	-	0.060625	-	1,105.21	194.57	0.287949	0.060625				
PTHP-SEER13-ER1_MF_CompE	356425	221.17	273.51	46.56	44.57	0.209540	-	0.044112	-	494.68	91.13	0.209540	0.044112				
PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF	356450	340.63	2,629.29	63.99	2,629.29	0.322719	-	0.060625	-	2,969.92	2,693.28	0.322719	0.060625				

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 60% ROF 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
PTHP-SEER13-Replace_PTAC_ElectricHeat_ER1_MF_CompE	356475	247.88	897.50	46.56	897.50	0.234846	-	0.044112	-	1,145.38	944.06	0.234846	0.044112
PTHP-SEER13-ROF_MF	356500	303.93	801.28	63.99	130.58	0.287949	-	0.060625	-	1,105.21	194.57	0.287949	0.060625
PTHP-SEER13-ROF_MF_CompE	356525	221.17	273.51	46.56	44.57	0.209540	-	0.044112	-	494.68	91.13	0.209540	0.044112
PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF	356550	340.63	2,629.29	63.99	2,629.29	0.322719	-	0.060625	-	2,969.92	2,693.28	0.322719	0.060625
PTHP-SEER13-Replace_PTAC_ElectricHeat_ROF_MF_CompE	356575	247.88	897.50	46.56	897.50	0.234846	-	0.044112	-	1,145.38	944.06	0.234846	0.044112
PTHP-SEER14-ER1_MF	356600	345.07	841.54	105.12	170.84	0.326926	-	0.099593	-	1,186.61	275.96	0.326926	0.099593
PTHP-SEER14-ER1_MF_CompE	356625	251.11	287.26	76.50	58.32	0.237906	-	0.072477	-	538.37	134.82	0.237906	0.072477
PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF	356650	381.76	2,669.55	105.12	2,669.55	0.361686	-	0.099593	-	3,051.31	2,774.67	0.361686	0.099593
PTHP-SEER14-Replace_PTAC_ElectricHeat_ER1_MF_CompE	356675	277.81	911.24	76.50	911.24	0.263202	-	0.072477	-	1,189.05	987.74	0.263202	0.072477
PTHP-SEER14-ROF_MF	356700	345.07	841.54	105.12	170.84	0.326926	-	0.099593	-	1,186.61	275.96	0.326926	0.099593
PTHP-SEER14-ROF_MF_CompE	356725	251.11	287.26	76.50	58.32	0.237906	-	0.072477	-	538.37	134.82	0.237906	0.072477
PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF	356750	381.76	2,669.55	105.12	2,669.55	0.361686	-	0.099593	-	3,051.31	2,774.67	0.361686	0.099593
PTHP-SEER14-Replace_PTAC_ElectricHeat_ROF_MF_CompE	356775	277.81	911.24	76.50	911.24	0.263202	-	0.072477	-	1,189.05	987.74	0.263202	0.072477
PTHP-SEER15-ER1_MF	356800	380.71	881.22	140.77	210.52	0.360692	-	0.133368	-	1,261.93	351.29	0.360692	0.133368
PTHP-SEER15-ER1_MF_CompE	356825	277.05	300.80	102.44	71.86	0.262482	-	0.097054	-	577.85	174.30	0.262482	0.097054
PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF	356850	417.41	2,709.23	140.77	2,709.23	0.395462	-	0.133368	-	3,126.64	2,850.00	0.395462	0.133368
PTHP-SEER15-Replace_PTAC_ElectricHeat_ER1_MF_CompE	356875	303.76	924.79	102.44	924.79	0.287788	-	0.097054	-	1,228.55	1,027.23	0.287788	0.097054
PTHP-SEER15-ROF_MF	356900	380.71	881.22	140.77	210.52	0.360692	-	0.133368	-	1,261.93	351.29	0.360692	0.133368
PTHP-SEER15-ROF_MF_CompE	356925	277.05	300.80	102.44	71.86	0.262482	-	0.097054	-	577.85	174.30	0.262482	0.097054
PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF	356950	417.41	2,709.23	140.77	2,709.23	0.395462	-	0.133368	-	3,126.64	2,850.00	0.395462	0.133368
PTHP-SEER15-Replace_PTAC_ElectricHeat_ROF_MF_CompE	356975	303.76	924.79	102.44	924.79	0.287788	-	0.097054	-	1,228.55	1,027.23	0.287788	0.097054