

# Residential and Business Deemed Savings Table

## MEEIA 2019-21



## Ameren Missouri Deemed Savings Table Revision Log

Ameren Missouri Deemed Savings Table	Date	Ameren Missouri TRM			Description
		Volume 1: Overview and User Guide	Volume 2: C&I Measures	Volume 3: Residential Measures	
Revision		Revision	Revision	Revision	
1.0	05/30/2018	1.0	1.0	1.0	Initial version filed for Commission approval.
2.0	12/31/2018	1.0	1.0	2.0	Updated RES/BUS "Deemed Tables" with PY2017 Evaluation results per Stipulation and Agreement (File No. EO-2018-0211). This included updates to Volume 3 of the TRM.
3.0	01/01/2020	1.0	1.0	3.0	• Updated "Deemed Tables" with PY2018 Evaluation results. Also includes revisions to HVAC measures and multifamily measures, based on feedback from evaluation contractor. This includes updates to Volume 3 of the TRM.
3.1	02/06/2020	1.0	1.0	3.0	• Updated "Deemed Tables" with updates for 11 step process/program updates and minor corrections found since prior TRMupdate.
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.

BUSINESS PRESCRIPTIVE MEASURES

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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_2019_12	C&I	LED <=11 Watt Lamp Replacing Interior Halogen A 28-52 Watt Lamp	173.16	Lighting BUS	0.0001899635	0.032894	17.0	\$15.64	per measure
800100_2019_12	C&I	LED 7-20 Watt Lamp Replacing Interior Halogen 53-70 Watt Lamp	132.04	Lighting BUS	0.0001899635	0.025083	17.0	\$19.64	per measure
800150_2019_12	C&I	LED <=14 Watt Lamp Replacing Interior Halogen BR/R 45-65 Watt Lamp	161.96	Lighting BUS	0.0001899635	0.030766	11.0	\$48.27	per measure
800200_2019_12	C&I	LED <=13 Watt Lamp Replacing Interior Halogen MR-16 35-50 Watt Lamp	154.05	Lighting BUS	0.0001899635	0.029264	11.0	\$36.64	per measure
800250_2019_12	C&I	LED <=20 Watt Lamp Replacing Interior Halogen PAR 48-90 Watt Lamp	227.11	Lighting BUS	0.0001899635	0.043143	11.0	\$74.64	per measure
800300_2019_12	C&I	LED <=80 Watt Lamp or Fixture Replacing Interior HID 100-175 Watt Lamp or Fixture	1,198.19	Lighting BUS	0.0001899635	0.227612	11.0	\$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	902.06	Lighting BUS	0.0001899635	0.171358	11.0	\$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	2,459.71	Lighting BUS	0.0001899635	0.277292	11.0	\$361.64	per measure
800450_2019_12	C&I	LED <=80 Watt Lamp or Fixture Replacing Garage or Exterior <24/7 HID 100-175 Watt Lamp or Fixture	446.20	Ext Lighting BUS	0.000056160	0.002506	12.0	\$191.39	per measure
800500_2019_12	C&I	LED 62 - 130 Watt Lamp or Fixture Replacing Garage or Exterior <24/7 HID 176-300 Watt Lamp or Fixture	713.51	Ext Lighting BUS	0.000056160	0.004007	12.0	\$233.64	per measure
800550_2019_12	C&I	LED 85 - 225 Watt Lamp or Fixture Replacing Garage or Exterior <24/7 HID 301-500 Watt Lamp or Fixture	1,003.93	Ext Lighting BUS	0.000056160	0.005638	12.0	\$361.64	per measure
800600_2019_12	C&I	LED <=80 Watt Lamp or Fixture Replacing Garage or Exterior 24/7 HID 100-175 Watt Lamp or Fixture Misc.	700.72	Miscellaneous BUS	0.0001379439	0.096660	6.0	\$191.39	per measure
800650_2019_12	C&I	LED 62 - 130 Watt Lamp or Fixture Replacing Garage or Exterior 24/7 HID 176-300 Watt Lamp or Fixture Misc.	1,482.27	Miscellaneous BUS	0.0001379439	0.204470	6.0	\$233.64	per measure
800700_2019_12	C&I	LED 85 - 225 Watt Lamp or Fixture Replacing Garage or Exterior 24/7 HID 301-500 Watt Lamp or Fixture Misc.	2,657.55	Miscellaneous BUS	0.0001379439	0.366593	6.0	\$361.64	per measure
800750_2019_12	C&I	LED or Electroluminescent Replacing Interior Incandescent/CFL Exit Sign	249.43	Lighting BUS	0.0001899635	0.047193	16.0	\$45.25	per measure
800800_2020_12	C&I	LED Replacing Interior T5 Fluorescent (Type A / Hybrid)	156.94	Lighting BUS	0.0001899635	0.029813	10.0	\$29.64	per measure
800801_2020_12	C&I	LED Replacing Interior T5 Fluorescent (Type B, C, Kits, and Fixtures)	365.22	Lighting BUS	0.0001899635	0.069378	15.0	\$29.64	per measure
800850_2020_12	C&I	LED Replacing Interior T8 Fluorescent (Type A / Hybrid)	86.01	Lighting BUS	0.0001899635	0.016339	10.0	\$29.64	per measure
800851_2020_12	C&I	LED Replacing Interior T8 Fluorescent (Type B, C, Kits, and Fixtures)	161.24	Lighting BUS	0.0001899635	0.030630	15.0	\$29.64	per measure
800900_2020_12	C&I	LED Replacing Interior T12 Fluorescent (Type A / Hybrid)	150.00	Lighting BUS	0.0001899635	0.028495	10.0	\$29.64	per measure
800901_2020_12	C&I	LED Replacing Interior T12 Fluorescent (Type B, C, Kits, and Fixtures)	181.13	Lighting BUS	0.0001899635	0.034408	15.0	\$29.64	per measure
800950_2019_12	C&I	LED Specialty Lamp	102.28	Lighting BUS	0.0001899635	0.019426	11.0	\$11.94	per measure

Lighting - Occupancy Sensor Lighting Controls

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801010_2020_07	C&I	Fixture Mounted Occupancy Sensor Controlling > 60 Watts	118.87	Lighting BUS	0.0001899635	0.022581	10.0	\$45.00	per measure
801020_2020_07	C&I	Remote Mounted Occupancy Sensor Controlling > 150 Watts	291.13	Lighting BUS	0.0001899635	0.055304	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	188.74	Lighting BUS	0.0001899635	0.035853	15.0	\$55.76	per measure
801227_2020_12	C&I	LED Fixture with Network Controls Replacing Interior T5 Fluorescent	188.74	Lighting BUS	0.0001899635	0.035853	15.0	\$55.76	per measure
801229_2020_12	C&I	LED Retrofit Kit with Network Controls Replacing Interior T8 Fluorescent	82.68	Lighting BUS	0.0001899635	0.015706	15.0	\$55.76	per measure
801231_2020_12	C&I	LED Fixture with Network Controls Replacing Interior T8 Fluorescent	82.68	Lighting BUS	0.0001899635	0.015706	15.0	\$55.76	per measure
801233_2020_12	C&I	LED Retrofit Kit with Network Controls Replacing Interior T12 Fluorescent	81.90	Lighting BUS	0.0001899635	0.015557	15.0	\$55.76	per measure
801235_2020_12	C&I	LED Fixture with Network Controls Replacing Interior T12 Fluorescent	81.90	Lighting BUS	0.0001899635	0.015557	15.0	\$55.76	per measure
801237_2020_12	C&I	LED Retrofit Kit with Network Controls Replacing Interior HID	1,111.18	Lighting BUS	0.0001899635	0.211084	11.0	\$366.72	per measure
801239_2020_12	C&I	LED Fixture with Network Controls Replacing Interior HID	1,111.18	Lighting BUS	0.0001899635	0.211084	11.0	\$366.72	per measure

Commercial Solid and Glass Door Refrigerators & Freezers

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
801250_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	2,403.25	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	0.433572	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

BUSINESS PRESCRIPTIVE MEASURES

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PROGRAMS: All

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	15.00	\$246.00	per measure

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
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)	700.50	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

HVAC

Measure Reference No.	Program/Channel	Measure	Cooling kWh Annual Savings	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_2020_07	C&I	Single Packag or Split System Unitary AC_DX 135 - 240kbtu	153.77	Cooling BUS	0.0009106840	0.140036	15.0	\$100.00	per ton
803300_2020_07	C&I	Single Packag or Split System Unitary AC_DX 240 - 760kbtu	167.94	Cooling BUS	0.0009106840	0.152994	15.0	\$100.00	per ton
803350_2020_07	C&I	Single Packag or Split System Unitary AC_DX 65 - 135kbtu	148.68	Cooling BUS	0.0009106840	0.1354	15.0	\$100.00	per ton
803400_2020_07	C&I	Single Packag or Split System Unitary AC_DX >760kbtu	167.52	Cooling BUS	0.0009106840	0.152558	15.0	\$100.00	per ton
803450_2020_07	C&I	Single Packag or Split System Unitary AC_DX <65kbtu	129.60	Cooling BUS	0.0009106840	0.118025	15.0	\$100.00	per ton

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PROGRAMS: All

HVAC

Measure Reference No.	Program/Channel	Measure	Cooling kWh Annual Savings	Heating kWh Annual Savings (per ton)	Total kWh Annual Savings	End Use	End Use	kW Factor	kW	EUL	Inc. Cost (per ton)	Units
803500_2019_12	C&I	GSHP <135kbtu; ≥17EER	36.71	27.99	64.70	Cooling BUS	Heating BUS	0.0009106840	0.033431	15.0	\$180.00	per ton
803550_2019_12	C&I	GSHP <135kbtu; ≥19EER	114.95	27.99	142.94	Cooling BUS	Heating BUS	0.0009106840	0.104683	15.0	\$180.00	per ton
803600_2020_07	C&I	ASHP 65 - 135kbtu	117.33	223.04	340.37	Cooling BUS	Heating BUS	0.0009106840	0.106851	15.0	\$100.00	per ton
803650_2020_07	C&I	ASHP 135 - 240kbtu	127.93	265.20	393.13	Cooling BUS	Heating BUS	0.0009106840	0.116504	15.0	\$100.00	per ton
803700_2020_07	C&I	ASHP >240kbtu	146.25	265.20	411.45	Cooling BUS	Heating BUS	0.0009106840	0.133188	15.0	\$100.00	per ton
803750_2020_07	C&I	ASHP <65kbtu	106.52	222.73	329.25	Cooling BUS	Heating BUS	0.0009106840	0.097006	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_2019_12	C&I	Air Cooled Chiller	411.00	Cooling BUS	0.0009106840	0.374291	20.0	\$106.23	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	0.059111	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

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_2020_07	C&I	VSD Air Compressor 5-40 HP	987.0	Air Comp BUS	0.0001379439	0.136152	10.00	"=(127*HPcomp)+1446"	per HP

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	0.0001988949	1.27379	12.0	\$4,300.00	per measure
805100_2019_12	C&I	Combination Oven (Pan Capacity ≥ 15)	11,743.62	Cooking BUS	0.0001988949	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	0.0001988949	0.190362	12.0	\$210.00	per measure
805200_2019_12	C&I	Large Vat Open Deep-Fat Fryer	2,537.84	Cooking BUS	0.0001988949	0.507301	12.0	\$0.00	per measure

BUSINESS PRESCRIPTIVE MEASURES

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Cells highlighted in this color are calculated variables

PROGRAMS: All

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	50.00	per measure
805300_2019_12_	C&I	Convection Oven (Half Size)	192.11	Cooking BUS	0.0001998949	0.038402	12.0	50.00	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	50.00	per measure

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)	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

BUSINESS PRESCRIPTIVE MEASURES

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PROGRAMS: All

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

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings (per)	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

High Volume Low Speed Fans

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings (per)	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)	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

\*\* CFL baseline is Post 2021, EISA baseline is pre-2021 \*\*

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_2019_12_	Lighting	LED - 10.5W Downlight E26 (CFL baseline)	9.68	0.001501	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	8.29	1.39	0.0012	0.0003	19.0	6.0	\$	0.0000010 per bulb
200100_2019_12_	Lighting	LED - 10.5W Downlight E26 (Halogen baseline)	39.74	0.006164	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	34.05	5.70	0.0051	0.0011	19.0	6.0	\$	0.0000010 per bulb
200150_2019_12_	Lighting	LED - 10W (CFL baseline) (750-1049 lumens)	4.70	0.000729	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.02	0.67	0.0006	0.0001	19.0	6.0	\$	0.0000010 per bulb
200200_2019_12_	Lighting	LED - 10W (Halogen baseline) (750-1049 lumens)	32.51	0.005042	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.85	4.66	0.0042	0.0009	19.0	6.0	\$	0.0000010 per bulb
200250_2019_12_	Lighting	LED - 12W Dimmable Light Bulb (Replacing CFL)	2.44	0.000379	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.09	0.35	0.0003	0.0001	19.0	6.0	\$	0.0000010 per bulb
200300_2019_12_	Lighting	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent)	72.16	0.011191	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	61.81	10.34	0.0092	0.0020	19.0	6.0	\$	0.0000010 per bulb
200350_2019_12_	Lighting	LED - 15W (Halogen baseline) (1050-1489 lumens)	38.43	0.005960	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	32.92	5.51	0.0049	0.0010	19.0	6.0	\$	0.0000010 per bulb
200400_2019_12_	Lighting	LED - 15W (CFL baseline) (1050-1489 lumens)	6.39	0.000991	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.47	0.92	0.0008	0.0002	19.0	6.0	\$	0.0000010 per bulb
200401_2020_12_	Lighting	LED - 11W Flood Light BR30 Bulb (CFL baseline)	7.41	0.001150	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.35	1.06	0.0009	0.0002	19.0	6.0	\$	0.0000010 per bulb
200402_2020_12_	Lighting	LED - 11W Flood Light BR30 Bulb (Halogen baseline)	50.74	0.007869	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	43.46	7.27	0.0065	0.0014	19.0	6.0	\$	0.0000010 per bulb
200450_2019_12_	Lighting	LED - 15W Flood Light PAR30 Bulb (CFL baseline)	5.64	0.000874	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.83	0.81	0.0007	0.0002	19.0	6.0	\$	0.0000010 per bulb
200500_2019_12_	Lighting	LED - 15W Flood Light PAR30 Bulb (Halogen baseline)	48.20	0.007475	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	41.29	6.91	0.0062	0.0013	19.0	6.0	\$	0.0000010 per bulb
200550_2019_12_	Lighting	LED - 18W Flood Light PAR30 Bulb (CFL baseline)	4.70	0.000729	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.02	0.67	0.0006	0.0001	19.0	6.0	\$	0.0000010 per bulb
200600_2019_12_	Lighting	LED - 18W Flood Light PAR38 Bulb (Halogen baseline)	77.04	0.011949	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	66.00	11.04	0.0099	0.0021	19.0	6.0	\$	0.0000010 per bulb
200650_2019_12_	Lighting	LED - 20W (CFL baseline) (1490-2600 lumens)	9.02	0.001399	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	7.73	1.29	0.0012	0.0002	19.0	6.0	\$	0.0000010 per bulb
200700_2019_12_	Lighting	LED - 20W (Halogen baseline) (1490-2600 lumens)	53.37	0.008277	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	45.72	7.65	0.0068	0.0015	19.0	6.0	\$	0.0000010 per bulb
200750_2019_12_	Lighting	LED - 4W Candelabra (CFL baseline)	4.70	0.000729	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.02	0.67	0.0006	0.0001	19.0	6.0	\$	0.0000010 per bulb
200800_2019_12_	Lighting	LED - 4W Candelabra (Replacing Specialty Incandescent)	32.88	0.005100	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	28.17	4.71	0.0042	0.0009	19.0	6.0	\$	0.0000010 per bulb
200850_2019_12_	Lighting	LED - 8W Globe Light G25 Bulb (Replacing CFL)	5.45	0.000845	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.67	0.78	0.0007	0.0001	19.0	6.0	\$	0.0000010 per bulb
200900_2019_12_	Lighting	LED - 8W Globe Light G25 Bulb (Replacing Specialty Incandescent)	34.01	0.005275	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	29.14	4.88	0.0043	0.0009	19.0	6.0	\$	0.0000010 per bulb
200950_2019_12_	Lighting	LED - 10W (Halogen baseline) (750-1049 lumens) - Specialty Connected Light	29.22	0.004532	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	25.03	4.19	0.0037	0.0008	19.0	6.0	\$	0.0000010 per bulb
201000_2019_12_	Lighting	LED - 15W (Halogen baseline) (1050-1489 lumens) - Specialty Connected Light	38.43	0.005960	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	32.92	5.51	0.0049	0.0010	19.0	6.0	\$	0.0000010 per bulb
201050_2019_12_	Lighting	LED - 15W Flood Light PAR30 Bulb (Halogen baseline) - Specialty Connected Light	46.23	0.007169	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	39.60	6.63	0.0059	0.0013	19.0	6.0	\$	0.0000010 per bulb
201100_2019_12_	Lighting	LED - 6W (Halogen baseline) (310-749 lumens)	21.61	0.003351	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	18.51	3.10	0.0028	0.0006	19.0	6.0	\$	0.0000010 per bulb

\*The present value cost of multiple Halogen or CFL bulbs over the life of the measure is typically at or below \$0. For modeling purposes, use 5.000001 to model these measures within DSMore.

\*\*EUL-BUS based on MO 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 <sub>cool</sub>	kWh <sub>heat</sub> - Electric Resistance	kWh <sub>heat</sub> - Heat Pumps	kW	EUL	Inc. Cost	Units
250050_2019_12_	Efficient Products	Heat Pump Hot Water Heater	2,276.14	Water Heating RES	0.0000887318	383.384127	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_2019_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling SF	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250100_2019_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling SF	550.48	Heating RES	0.0000000000	0.000000	10.0		per measure
250101_2019_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling MF	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250101_2019_12_	Efficient Products	Learning Thermostat - ASHP heating/cooling MF	357.82	Heating RES	0.0000000000	0.000000	10.0		per measure
250102_2019_12_	Efficient Products_CompE	Learning Thermostat - ASHP heating/cooling MF_CompE	134.70	Cooling RES	0.0009474181	0.127617	10.0	\$125.00	per measure
250102_2019_12_	Efficient Products_CompE	Learning Thermostat - ASHP heating/cooling MF_CompE	121.74	Heating RES	0.0000000000	0.000000	10.0		per measure
250150_2019_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC MF	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250150_2019_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC MF	608.22	Heating RES	0.0000000000	0.000000	10.0		per measure
250151_2019_12_	Efficient Products_CompE	Learning Thermostat - electric furnace heating / central AC MF_CompE	134.70	Cooling RES	0.0009474181	0.127617	10.0	\$125.00	per measure
250151_2019_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_2019_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC SF	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250250_2019_12_	Efficient Products	Learning Thermostat - electric furnace heating / central AC SF	935.72	Heating RES	0.0000000000	0.000000	10.0		per measure
250350_2019_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC SF**	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250350_2019_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC SF**	41.35	Heating RES	0.0000000000	0.000000	10.0		per measure
250351_2019_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC MF**	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250351_2019_12_	Efficient Products	Learning Thermostat - Gas Heated / central AC MF**	26.88	Heating RES	0.0000000000	0.000000	10.0		per measure
250352_2019_12_	Efficient Products_CompE	Learning Thermostat - Gas Heated / central AC MF_CompE**	134.70	Cooling RES	0.0009474181	0.127617	10.0	\$125.00	per measure
250352_2019_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_2019_12_	Efficient Products	Learning Thermostat - Unknown SF**	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250450_2019_12_	Efficient Products	Learning Thermostat - Unknown SF**	158.56	Heating RES	0.0000000000	0.000000	10.0		per measure
250451_2019_12_	Efficient Products	Learning Thermostat - Unknown MF**	185.21	Cooling RES	0.0009474181	0.175471	10.0	\$125.00	per measure
250451_2019_12_	Efficient Products	Learning Thermostat - Unknown MF**	103.06	Heating RES	0.0000000000	0.000000	10.0		per measure
250452_2019_12_	Efficient Products_CompE	Learning Thermostat - Unknown MF_CompE**	134.70	Cooling RES	0.0009474181	0.127617	10.0	\$125.00	per measure
250452_2019_12_	Efficient Products_CompE	Learning Thermostat - Unknown MF_CompE**	49.89	Heating RES	0.0000000000	0.000000	10.0		per measure

ENERGY STAR Pool Pump and motor w auto controls - multi speed

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
250500_2019_12_	Efficient Products	ENERGY STAR Pool Pump and motor w auto controls - multi speed	1,799.73	Pool Spa RES	0.0002354459	0.423739	10.0	\$235.00	per measure
250550_2019_12_	Efficient Products	ENERGY STAR VFDs on Residential Swimming Pool Pumps	2,052.85	Pool Spa RES	0.0002354459	0.483335	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

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	LI	Dirty Filter Alarm_SF - LI Kits	98.22	HVAC RES	0.0004660805	62.13	36.09	0.045778	14.0	\$5.00	per measure
300060_2020_12	ARP	Dirty Filter Alarm_SF - ARP Kits	37.09	HVAC RES	0.0004660805	9.66	27.43	0.017287	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_2019_12	School	LED - 10W (CFL baseline) (750-1049 lumens)	2.87	Lighting RES	0.0001492529	0.000428	19.0	\$1.95	per measure
300200_2019_12	MF	LED - 10W (CFL baseline) (750-1049 lumens)	4.34	Lighting RES	0.0001492529	0.000648	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	LI	LED - 10W (Halogen baseline) (750-1049 lumens) - LI Kit	30.15	Lighting RES	0.0001492529	0.004506	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	0.004406	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_2019_12	School	LED - 10.5W Downlight E26 (CFL baseline)	7.83	Lighting RES	0.0001492529	0.001169	19.0	\$1.95	per measure
300400_2019_12	MF	LED - 10.5W Downlight E26 (CFL baseline)	33.50	Lighting RES	0.0001492529	0.001764	19.0	\$1.95	per measure
300401_2020_12	LI	LED 8W Globe Light G25 Bulb (Halogen Baseline) - LI Kit	5.14	Lighting RES	0.0001492529	0.004791	19.0	\$1.95	per measure
300402_2020_12	LI	LED 20W (Halogen baseline) (1490-2600 lumens) - LI Kit	50.36	Lighting RES	0.0001492529	0.007516	19.0	\$1.95	per measure
300403_2020_12	LI	LED 15W Flood Light PAR30 Bulb (Halogen Baseline) - LI Kit	45.49	Lighting RES	0.0001492529	0.006790	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	10.0	\$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	10.0	\$3.00	per measure
300500_2019_12	MF	Kit Faucet Aerator (Kitchen)	99.55	Water Heating RES	0.0000887318	0.079	0.008833	10.0	\$3.00	per measure
300501_2020_12	LI	Kit Faucet Aerator (Kitchen) - SFLI Kits	43.69	Water Heating RES	0.0000887318	0.079	0.003877	10.0	\$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	LI	Kit Faucet Aerator (Bathroom) - SFLI Kits	13.84	Water Heating RES	0.0000887318	0.04658558	0.001228	10.0	\$3.00	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
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_2020_12	LI	Low Flow Showerheads - SFLI 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	LI	Pipe Insulation - SFLI Kits	3.40	Water Heating RES	0.0000887318	0.000302	12.0	\$2.87	per foot

RESIDENTIAL ENERGY EFFICIENCY KITS

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_2020_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_2020_12	LI	Advanced Tier 2 Power Strips - SFLI 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_2019_12	SF	ECM Auto Fan ROF-SF	582.00	HVAC RES	0.0004660805	264.1	31.13	286.72	-	0.271259000	20.0	\$0.00	per measure
350100_2019_12	MF	ECM Auto Fan ROF-MF	582.00	HVAC RES	0.0004660805	264.1	31.13	286.72	-	0.271259000	20.0	\$0.00	per measure
350150_2019_12	SF	ECM Auto Fan ER1 - SF	582.00	HVAC RES	0.0004660805	264.1	31.13	286.72	-	0.271259000	6.0	\$74.33	per measure
350150_2019_12	SF	ECM Auto Fan ER2 - SF	582.00	HVAC RES ER2	0.0004660805	264.1	31.13	286.72	-	0.271259000	12.0	\$0.00	per measure
350175_2019_12	MF	ECM Auto Fan ER1 - MF	582.00	HVAC RES	0.0004660805	264.1	31.13	286.72	-	0.271259000	6.0	\$74.33	per measure
350175_2019_12	MF	ECM Auto Fan ER2 - MF	582.00	HVAC RES ER2	0.0004660805	264.1	31.13	286.72	-	0.271259000	12.0	\$0.00	per measure
350200_2019_12	SF	ECM Continuous Fan ROF- SF	582.00	HVAC RES	0.0004660805	264.1	31.13	-	286.72	0.271259000	20.0	\$0.00	per measure
350250_2019_12	MF	ECM Continuous Fan ROF- MF	582.00	HVAC RES	0.0004660805	264.1	31.13	-	286.72	0.271259000	20.0	\$0.00	per measure
350300_2019_12	SF	ECM Continuous Fan ER1 - SF	582.00	HVAC RES	0.0004660805	264.1	31.13	-	286.72	0.271259000	6.0	\$74.33	per measure
350300_2019_12	SF	ECM Continuous Fan ER2 - SF	582.00	HVAC RES ER2	0.0004660805	264.1	31.13	-	286.72	0.271259000	12.0	\$0.00	per measure
350350_2019_12	MF	ECM Continuous Fan ER1 - MF	582.00	HVAC RES	0.0004660805	264.1	31.13	-	286.72	0.271259000	6.0	\$74.33	per measure
350350_2019_12	MF	ECM Continuous Fan ER2 - MF	582.00	HVAC RES ER2	0.0004660805	264.1	31.13	-	286.72	0.271259000	12.0	\$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 ECMA part of the baseline for New Construction (NC), Replace-on-Fail (ROF), Time-of-Replacement (TOS), and Early Replacement (EREP) scenarios.

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)
350400_2019_12	SF	CAC - SEER 14 ER1: SF	1,532.85	Cooling RES	0.0009474181	1.452250	6	\$444	2.98
350400_2019_12	SF	CAC - SEER 14 ER2: SF	192.72	Cooling RES ER2	0.0009474181	0.182586	12	\$0	2.98
350450_2019_12	SF	CAC - SEER 14 ROF: SF	192.07	Cooling RES	0.0009474181	0.181971	18	\$0	2.97
350500_2019_12	MF	CAC - SEER 14 ER1: MF	1,014.01	Cooling RES	0.0009474181	0.960691	6	\$388	2.00
350500_2019_12	MF	CAC - SEER 14 ER2: MF	114.59	Cooling RES ER2	0.0009474181	0.108565	12	\$0	2.00
350501_2019_12	MFC	CAC - SEER 14 ER1: MF_CompE	737.46	Cooling RES	0.0009474181	0.698683	6	\$298	2.00
350501_2019_12	MFC	CAC - SEER 14 ER2: MF_CompE	83.34	Cooling RES ER2	0.0009474181	0.078958	12	\$0	2.00
350550_2019_12	MF	CAC - SEER 14 ROF: MF	114.59	Cooling RES	0.0009474181	0.108565	18	\$0	2.00
350551_2019_12	MFC	CAC - SEER 14 ROF: MF_CompE	83.34	Cooling RES	0.0009474181	0.078958	18	\$0	2.00
350600_2019_12	SF	CAC - SEER 15 ER1: SF	2,258.48	Cooling RES	0.0009474181	2.139725	6	\$592	3.25
350600_2019_12	SF	CAC - SEER 15 ER2: SF	363.60	Cooling RES ER2	0.0009474181	0.344481	12	\$0	3.25
350650_2019_12	SF	CAC - SEER 15 ROF: SF	373.31	Cooling RES	0.0009474181	0.353681	18	\$108	3.32
350700_2019_12	MF	CAC - SEER 15 ER1: MF	1,738.76	Cooling RES	0.0009474181	1.647333	6	\$455	2.33
350700_2019_12	MF	CAC - SEER 15 ER2: MF	263.63	Cooling RES ER2	0.0009474181	0.249768	12	\$0	2.33
350701_2019_12	MFC	CAC - SEER 15 ER1: MF_CompE	1,078.19	Cooling RES	0.0009474181	1.021497	6	\$406	2.00
350701_2019_12	MFC	CAC - SEER 15 ER2: MF_CompE	155.57	Cooling RES ER2	0.0009474181	0.147390	12	\$0	2.00
350750_2019_12	MF	CAC - SEER 15 ROF: MF	230.82	Cooling RES	0.0009474181	0.218683	18	\$108	2.08
350751_2019_12	MFC	CAC - SEER 15 ROF: MF_CompE	155.57	Cooling RES	0.0009474181	0.147390	18	\$108	2.00
350800_2019_12	SF	CAC - SEER 16 ER1: SF	2,198.32	Cooling RES	0.0009474181	2.082728	6	\$665	2.98
350800_2019_12	SF	CAC - SEER 16 ER2: SF	451.39	Cooling RES ER2	0.0009474181	0.427655	12	\$0	2.98
350850_2019_12	SF	CAC - SEER 16 ROF: SF	458.17	Cooling RES	0.0009474181	0.434079	18	\$221	3.02
350900_2019_12	MF	CAC - SEER 16 ER1: MF	1,687.17	Cooling RES	0.0009474181	1.598455	6	\$604	2.57
350900_2019_12	MF	CAC - SEER 16 ER2: MF	391.02	Cooling RES ER2	0.0009474181	0.370459	12	\$0	2.57
350901_2019_12	MFC	CAC - SEER 16 ER1: MF_CompE	951.94	Cooling RES	0.0009474181	0.901885	6	\$519	2.00
350901_2019_12	MFC	CAC - SEER 16 ER2: MF_CompE	218.77	Cooling RES ER2	0.0009474181	0.207267	12	\$0	2.00
350950_2019_12	MF	CAC - SEER 16 ROF: MF	408.24	Cooling RES	0.0009474181	0.386774	18	\$221	2.71
350951_2019_12	MFC	CAC - SEER 16 ROF: MF_CompE	218.77	Cooling RES	0.0009474181	0.207267	18	\$221	2.00
351000_2019_12	SF	CAC - SEER 17 ER1: SF	2,431.04	Cooling RES	0.0009474181	2.303211	6	\$1,079	3.08
351000_2019_12	SF	CAC - SEER 17 ER2: SF	645.84	Cooling RES ER2	0.0009474181	0.611881	12	\$0	3.08
351050_2019_12	SF	CAC - SEER 17 ROF: SF	665.30	Cooling RES	0.0009474181	0.630317	18	\$620	3.20
351100_2019_12	MF	CAC - SEER 17 ER1: MF	2,200.86	Cooling RES	0.0009474181	2.085135	6	\$986	2.45
351100_2019_12	MF	CAC - SEER 17 ER2: MF	475.26	Cooling RES ER2	0.0009474181	0.450270	12	\$0	2.45
351101_2019_12	MFC	CAC - SEER 17 ER1: MF_CompE	928.65	Cooling RES	0.0009474181	0.879820	6	\$918	2.00
351101_2019_12	MFC	CAC - SEER 17 ER2: MF_CompE	274.53	Cooling RES ER2	0.0009474181	0.260095	12	\$0	2.00
351150_2019_12	MF	CAC - SEER 17 ROF: MF	754.97	Cooling RES	0.0009474181	0.715272	18	\$620	4.00
351151_2019_12	MFC	CAC - SEER 17 ROF: MF_CompE	274.53	Cooling RES	0.0009474181	0.260095	18	\$620	2.00
351160_2020_02	SF	CAC - SEER 18 ER1: SF	2,017.58	Cooling RES	0.0009474181	1.911492	6	\$1,274	3.00
351160_2020_02	SF	CAC - SEER 18 ER2: SF	668.46	Cooling RES ER2	0.0009474181	0.633311	12	\$0	3.00
351161_2020_02	SF	CAC - SEER 18 ROF: SF	658.46	Cooling RES	0.0009474181	0.630317	18	\$827	3.00
351162_2020_02	MF	CAC - SEER 18 ER1: MF	1,345.05	Cooling RES	0.0009474181	1.274325	6	\$1,215	2.00
351162_2020_02	MF	CAC - SEER 18 ER2: MF	445.64	Cooling RES ER2	0.0009474181	0.422207	12	\$0	2.00
351163_2020_02	MFC	CAC - SEER 18 ER1: MF_CompE	978.22	Cooling RES	0.0009474181	0.926783	6	\$1,125	2.00
351163_2020_02	MFC	CAC - SEER 18 ER2: MF_CompE	324.10	Cooling RES ER2	0.0009474181	0.307058	12	\$0	2.00
351164_2020_02	MF	CAC - SEER 18 ROF: MF	445.64	Cooling RES	0.0009474181	0.422207	18	\$827	2.00
351165_2020_02	MFC	CAC - SEER 18 ROF: MF_CompE	324.10	Cooling RES	0.0009474181	0.307058	18	\$827	2.00
351170_2020_02	SF	CAC - SEER 19 ER1: SF	2,109.06	Cooling RES	0.0009474181	1.998162	6	\$1,480	3.00
351170_2020_02	SF	CAC - SEER 19 ER2: SF	759.94	Cooling RES ER2	0.0009474181	0.719981	12	\$0	3.00
351171_2020_02	SF	CAC - SEER 19 ROF: SF	759.94	Cooling RES	0.0009474181	0.719981	18	\$1,033	3.00
351172_2020_02	MF	CAC - SEER 19 ER1: MF	1,406.04	Cooling RES	0.0009474181	1.321108	6	\$1,331	2.00
351172_2020_02	MF	CAC - SEER 19 ER2: MF	506.62	Cooling RES ER2	0.0009474181	0.479981	12	\$0	2.00
351173_2020_02	MFC	CAC - SEER 19 ER1: MF_CompE	1,022.57	Cooling RES	0.0009474181	0.968801	6	\$1,331	2.00
351173_2020_02	MFC	CAC - SEER 19 ER2: MF_CompE	368.45	Cooling RES ER2	0.0009474181	0.349076	12	\$0	2.00
351174_2020_02	MF	CAC - SEER 19 ROF: MF	506.62	Cooling RES	0.0009474181	0.479981	18	\$1,033	2.00
351175_2020_02	MFC	CAC - SEER 19 ROF: MF_CompE	368.45	Cooling RES	0.0009474181	0.349076	18	\$1,033	2.00
351180_2020_02	SF	CAC - SEER 20 ER1: SF	2,191.38	Cooling RES	0.0009474181	2.076153	6	\$1,687	3.00
351180_2020_02	SF	CAC - SEER 20 ER2: SF	842.26	Cooling RES ER2	0.0009474181	0.797972	12	\$0	3.00
351181_2020_02	SF	CAC - SEER 20 ROF: SF	842.26	Cooling RES	0.0009474181	0.797972	18	\$1,240	3.00
351182_2020_02	MF	CAC - SEER 20 ER1: MF	1,460.92	Cooling RES	0.0009474181	1.384102	6	\$1,538	2.00
351182_2020_02	MF	CAC - SEER 20 ER2: MF	561.51	Cooling RES ER2	0.0009474181	0.531985	12	\$0	2.00
351183_2020_02	MFC	CAC - SEER 20 ER1: MF_CompE	1,062.49	Cooling RES	0.0009474181	1.006622	6	\$1,538	2.00
351183_2020_02	MFC	CAC - SEER 20 ER2: MF_CompE	408.37	Cooling RES ER2	0.0009474181	0.386897	12	\$0	2.00
351184_2020_02	MF	CAC - SEER 20 ROF: MF	561.51	Cooling RES	0.0009474181	0.531985	18	\$1,240	2.00
351185_2020_02	MFC	CAC - SEER 20 ROF: MF_CompE	408.37	Cooling RES	0.0009474181	0.386897	18	\$1,240	2.00
351190_2020_02	SF	CAC - SEER 21+ ER1: SF	2,265.87	Cooling RES	0.0009474181	2.146726	6	\$1,894	3.00
351190_2020_02	SF	CAC - SEER 21+ ER2: SF	916.75	Cooling RES ER2	0.0009474181	0.868546	12	\$0	3.00
351191_2020_02	SF	CAC - SEER 21+ ROF: SF	916.75	Cooling RES	0.0009474181	0.868546	18	\$1,447	3.00
351192_2020_02	MF	CAC - SEER 21+ ER1: MF	1,510.58	Cooling RES	0.0009474181	1.431151	6	\$1,745	2.00
351192_2020_02	MF	CAC - SEER 21+ ER2: MF	611.16	Cooling RES ER2	0.0009474181	0.579024	12	\$0	2.00
351193_2020_02	MFC	CAC - SEER 21+ ER1: MF_CompE	1,098.60	Cooling RES	0.0009474181	1.040834	6	\$1,745	2.00
351193_2020_02	MFC	CAC - SEER 21+ ER2: MF_CompE	444.48	Cooling RES ER2	0.0009474181	0.421108	12	\$0	2.00
351194_2020_02	MF	CAC - SEER 21+ ROF: MF	611.16	Cooling RES	0.0009474181	0.579024	18	\$1,447	2.00
351195_2020_02	MFC	CAC - SEER 21+ ROF: MF_CompE	444.48	Cooling RES	0.0009474181	0.421108	18	\$1,447	2.00

\*Incremental cost to be adjusted based on cost testing used

**RESIDENTIAL HVAC**

**Ductless 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_2019_12	SF	Ductless AC - ER1 SF	1,320.98	Cooling RES	0.0009474181	1.251520	6.0	\$1,231.16	1.3
351200_2019_12	SF	Ductless AC - ER2 SF	385.92	Cooling RES ER2	0.0009474181	0.365628	12.0	\$0.00	
351250_2019_12	SF	Ductless AC - ROF SF	332.95	Cooling RES	0.0009474181	0.315443	18.0	\$336.00	1.3
351300_2019_12	SF	Ductless ASHP - ROF SF NC	214.85	Cooling RES	0.0009474181	0.203553	18.0	\$336.00	1.5
351300_2019_12	SF	Ductless ASHP - ROF SF NC	513.91	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351350_2019_12	SF	Ductless ASHP - ROF SF	312.66	Cooling RES	0.0009474181	0.296220	18.0	\$336.00	1.5
351350_2019_12	SF	Ductless ASHP - ROF SF	585.46	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351400_2019_12	SF	Ductless ASHP Replace Electric Resistance ER1 SF	1,039.47	Cooling RES	0.0009474181	0.984813	6.0	\$2,504.17	1.6
351400_2019_12	SF	Ductless ASHP Replace Electric Resistance ER1 SF	3,646.53	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351400_2019_12	SF	Ductless ASHP Replace Electric Resistance ER2 SF	386.88	Cooling RES ER2	0.0009474181	0.366537	12.0	\$0.00	
351400_2019_12	SF	Ductless ASHP Replace Electric Resistance ER2 SF	3,646.53	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351450_2019_12	SF	Ductless ASHP Replace Electric Resistance ROF SF	345.19	Cooling RES	0.0009474181	0.327039	18.0	\$336.00	1.6
351450_2019_12	SF	Ductless ASHP Replace Electric Resistance ROF SF	4,050.16	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351500_2019_12	SF	Ductless ASHP ER1 SF	779.12	Cooling RES	0.0009474181	0.738152	6.0	\$648.60	1.3
351500_2019_12	SF	Ductless ASHP ER1 SF	1,021.30	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351500_2019_12	SF	Ductless ASHP ER2 SF	312.22	Cooling RES ER2	0.0009474181	0.295803	12.0	\$0.00	
351500_2019_12	SF	Ductless ASHP ER2 SF	515.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351550_2019_12	MF	Ductless AC - ER1 MF	1,320.98	Cooling RES	0.0009474181	1.251520	6.0	\$1,231.16	1.5
351550_2019_12	MF	Ductless AC - ER2 MF	385.92	Cooling RES ER2	0.0009474181	0.365628	12.0	\$0.00	
351551_2019_12	Mfc	Ductless AC - ER1 MF_CompE	867.48	Cooling RES	0.0009474181	0.821866	6.0	\$1,231.16	1.5
351551_2019_12	Mfc	Ductless AC - ER2 MF_CompE	253.43	Cooling RES ER2	0.0009474181	0.240104	12.0	\$0.00	
351600_2019_12	MF	Ductless AC - ROF MF	332.95	Cooling RES	0.0009474181	0.315443	18.0	\$336.00	1.3
351601_2019_12	Mfc	Ductless AC - ROF MF_CompE	755.93	Cooling RES	0.0009474181	0.716182	18.0	\$336.00	1.3
351650_2019_12	MF	Ductless ASHP - ROF MF NC	214.85	Cooling RES	0.0009474181	0.203553	18.0	\$336.00	1.5
351650_2019_12	MF	Ductless ASHP - ROF MF NC	513.91	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351651_2019_12	Mfc	Ductless ASHP - ROF MF_NC_CompE	141.09	Cooling RES	0.0009474181	0.133671	18.0	\$336.00	1.5
351651_2019_12	Mfc	Ductless ASHP - ROF MF_NC_CompE	195.32	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351700_2019_12	MF	Ductless ASHP - ROF MF	312.66	Cooling RES	0.0009474181	0.296220	18.0	\$336.00	1.5
351700_2019_12	MF	Ductless ASHP - ROF MF	585.46	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351701_2019_12	Mfc	Ductless ASHP - ROF MF_CompE	205.32	Cooling RES	0.0009474181	0.194524	18.0	\$336.00	1.5
351701_2019_12	Mfc	Ductless ASHP - ROF MF_CompE	222.52	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351750_2019_12	MF	Ductless ASHP Replace Electric Resistance ER1 MF	1,039.47	Cooling RES	0.0009474181	0.984813	6.0	\$2,504.17	1.6
351750_2019_12	MF	Ductless ASHP Replace Electric Resistance ER1 MF	3,646.53	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351750_2019_12	MF	Ductless ASHP Replace Electric Resistance ER2 MF	386.88	Cooling RES ER2	0.0009474181	0.366537	12.0	\$0.00	
351750_2019_12	MF	Ductless ASHP Replace Electric Resistance ER2 MF	3,646.53	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351751_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ER1 MF_CompE	682.61	Cooling RES	0.0009474181	0.646717	6.0	\$2,504.17	1.6
351751_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ER1 MF_CompE	1,385.96	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351751_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ER2 MF_CompE	254.06	Cooling RES ER2	0.0009474181	0.240701	12.0	\$0.00	
351751_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ER2 MF_CompE	1,385.96	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351800_2019_12	MF	Ductless ASHP Replace Electric Resistance ROF MF	345.19	Cooling RES	0.0009474181	0.327039	18.0	\$336.00	1.6
351801_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ROF MF_CompE	4,050.16	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351801_2019_12	Mfc	Ductless ASHP Replace Electric Resistance ROF MF_CompE	1,539.37	Heating RES	0.0000000000	0.000000	18.0	\$0.00	
351850_2019_12	MF	Ductless ASHP ER1 MF	779.12	Cooling RES	0.0009474181	0.738152	6.0	\$648.60	1.3
351850_2019_12	MF	Ductless ASHP ER1 MF	1,021.30	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351850_2019_12	MF	Ductless ASHP ER2 MF	312.22	Cooling RES ER2	0.0009474181	0.295803	12.0	\$0.00	
351850_2019_12	MF	Ductless ASHP ER2 MF	515.00	Heating RES ER2	0.0000000000	0.000000	12.0	\$0.00	
351851_2019_12	Mfc	Ductless ASHP ER1 MF_CompE	511.64	Cooling RES	0.0009474181	0.484737	6.0	\$648.60	1.3
351851_2019_12	Mfc	Ductless ASHP ER1 MF_CompE	388.17	Heating RES	0.0000000000	0.000000	6.0	\$0.00	
351851_2019_12	Mfc	Ductless ASHP ER2 MF_CompE	205.03	Cooling RES ER2	0.0009474181	0.194249	12.0	\$0.00	
351851_2019_12	Mfc	Ductless ASHP ER2 MF_CompE	195.74	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_2019_12	MF	DFHP - SEER 19 MF heat pump base	433.19	Cooling Res	0.0009474181	0.410412	18.0	\$2,936.60	3.4
351900_2019_12	MF	DFHP - SEER 19 MF heat pump base	651.42	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351901_2019_12	Mfc	DFHP - SEER 19 MF heat pump base_CompE	315.05	Cooling Res	0.0009474181	0.298484	18.0	\$2,936.60	3.4
351901_2019_12	Mfc	DFHP - SEER 19 MF heat pump base_CompE	296.89	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351950_2019_12	MF	DFHP - SEER 20 MF heat pump base	639.09	Cooling Res	0.0009474181	0.605485	18.0	\$3,176.60	4.4
351950_2019_12	MF	DFHP - SEER 20 MF heat pump base	990.72	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
351951_2019_12	Mfc	DFHP - SEER 20 MF heat pump base_CompE	464.79	Cooling Res	0.0009474181	0.440350	18.0	\$3,176.60	4.4
351951_2019_12	Mfc	DFHP - SEER 20 MF heat pump base_CompE	451.54	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352000_2019_12	MF	DFHP - SEER 21 MF heat pump base	871.48	Cooling Res	0.0009474181	0.825656	18.0	\$3,626.60	5.4
352000_2019_12	MF	DFHP - SEER 21 MF heat pump base	1,383.74	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352001_2019_12	Mfc	DFHP - SEER 21 MF heat pump base_CompE	633.81	Cooling Res	0.0009474181	0.600483	18.0	\$3,626.60	5.4
352001_2019_12	Mfc	DFHP - SEER 21 MF heat pump base_CompE	630.66	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_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC - Cooling	1,387.05	Cooling Res	0.0009474181	1.314116	18.0	\$4,717.00	3.8125
352050_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC - Heating	16,908.54	Heating RES	0.0000000000	0.000000	18.0		
352100_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC ER1 - Cooling	4,734.18	Cooling Res	0.0009474181	4.485248	6.0	\$5,250.00	3.8125
352100_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC ER1 - Heating	15,550.48	Heating RES	0.0000000000	0.000000	6.0		
352100_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC ER2 - Cooling	1,603.59	Cooling Res ER2	0.0000000000	1.519270	12.0		
352100_2019_12	SF	GSHP - EER 23 - replace electric furnace / CAC ER2 - Heating	15,550.48	Heating RES ER2	0.0000000000	0.000000	12.0		
352200_2019_12	SF	GSHP EER 23 ER1 - Cooling	2,089.52	Cooling Res	0.0009474181	1.979649	6.0	\$4,859.00	4.276595745
352200_2019_12	SF	GSHP EER 23 ER1 - Heating	2,968.34	Heating RES	0.0000000000	0.000000	6.0		
352200_2019_12	SF	GSHP EER 23 ER2 - Cooling	1,536.02	Cooling Res ER2	0.0009474181	1.455253	12.0		
352200_2019_12	SF	GSHP EER 23 ER2 - Heating	2,185.70	Heating RES ER2	0.0000000000	0.000000	12.0		
352250_2019_12	SF	GSHP EER 23 Replace at Fall GSHP	1,553.75	Cooling Res	0.0009474181	1.472051	18.0	\$3,200.00	4.30
352250_2019_12	SF	GSHP EER 23 Replace at Fall GSHP	2,199.89	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_2019_12	SF	ASHP - SEER 15 ER Elec Resist Furnace: HVAC ER1	2,165.13	Cooling Res	0.0009474181	2.051283	6.0	\$989.09	2.9
352300_2019_12	SF	ASHP - SEER 15 ER Elec Resist Furnace: HVAC ER1	9,075.00	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352300_2019_12	SF	ASHP - SEER 15 ER Elec Resist Furnace: HVAC ER2	324.12	Cooling Res ER2	0.0009474181	0.307077	12.0	\$0.00	
352300_2019_12	SF	ASHP - SEER 15 ER Elec Resist Furnace: HVAC ER2	9,075.00	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352350_2019_12	SF	ASHP - SEER 15 ER with ASHP: HVAC ER1	2,190.89	Cooling Res	0.0009474181	2.075689	6.0	\$1,044.15	3.1
352350_2019_12	SF	ASHP - SEER 15 ER with ASHP: HVAC ER1	1,893.17	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352350_2019_12	SF	ASHP - SEER 15 ER with ASHP: HVAC ER2	171.72	Cooling Res ER2	0.0009474181	0.162691	12.0	\$0.00	
352350_2019_12	SF	ASHP - SEER 15 ER with ASHP: HVAC ER2	221.27	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352400_2019_12	SF	ASHP - SEER 15 Replace at Fall Elec Resist Furnace: HVAC	345.06	Cooling Res	0.0009474181	0.326916	18.0	\$303.00	3.2
352400_2019_12	SF	ASHP - SEER 15 Replace at Fall Elec Resist Furnace: HVAC	9,372.23	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352450_2019_12	SF	ASHP - SEER 15 Replace at Fall with ASHP: HVAC	166.02	Cooling Res	0.0009474181	0.157290	18.0	\$303.00	2.9
352450_2019_12	SF	ASHP - SEER 15 Replace at Fall with ASHP: HVAC	363.62	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352500_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement SF ER1	2,277.63	Cooling Res	0.0009474181	2.157868	6.0	\$1,142.38	2.9
352500_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement SF ER1	9,240.10	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352500_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement SF ER2	473.24	Cooling Res ER2	0.0009474181	0.448356	12.0	\$0.00	
352500_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement SF ER2	9,240.10	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352550_2019_12	SF	ASHP SEER 16 replace ASHP - early replacement SF ER1	2,180.10	Cooling Res	0.0009474181	2.065466	6.0	\$1,181.05	3.1
352550_2019_12	SF	ASHP SEER 16 replace ASHP - early replacement SF ER1	2,201.93	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352550_2019_12	SF	ASHP SEER 16 replace ASHP - early replacement SF ER2	333.47	Cooling Res ER2	0.0009474181	0.315936	12.0	\$0.00	
352550_2019_12	SF	ASHP SEER 16 replace ASHP - early replacement SF ER2	925.75	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352600_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC SF	463.89	Cooling Res	0.0009474181	0.439498	18.0	\$438.00	3.0
352600_2019_12	SF	ASHP - SEER 16 - replace electric furnace / CAC SF	9,504.21	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352650_2019_12	SF	ASHP SEER 16 replace ASHP - replace on fail SF	302.60	Cooling Res	0.0009474181	0.286689	18.0	\$438.00	3.3
352650_2019_12	SF	ASHP SEER 16 replace ASHP - replace on fail SF	928.06	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352700_2019_12	MF	ASHP SEER 15 MF ER replace ASHP: HVAC ER1	1,328.60	Cooling Res	0.0009474181	1.258740	6.0	\$749.52	2.9
352700_2019_12	MF	ASHP SEER 15 MF ER replace ASHP: HVAC ER1	1,396.62	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352700_2019_12	MF	ASHP SEER 15 MF ER replace ASHP: HVAC ER2	103.53	Cooling Res ER2	0.0009474181	0.098086	12.0	\$0.00	
352700_2019_12	MF	ASHP SEER 15 MF ER replace ASHP: HVAC ER2	389.37	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352701_2019_12	Mfc	ASHP SEER 15 MF ER replace ASHP: HVAC ER1_CompE	1,041.88	Cooling Res	0.0009474181	0.987096	6.0	\$749.52	2.9
352701_2019_12	Mfc	ASHP SEER 15 MF ER replace ASHP: HVAC ER1_CompE	423.54	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352701_2019_12	Mfc	ASHP SEER 15 MF ER replace ASHP: HVAC ER2_CompE	81.19	Cooling Res ER2	0.0009474181	0.076921	12.0	\$0.00	
352701_2019_12	Mfc	ASHP SEER 15 MF ER replace ASHP: HVAC ER2_CompE	80.16	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352750_2019_12	MF	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER1	1,281.84	Cooling Res	0.0009474181	1.214438	6.0	\$730.10	2.8
352750_2019_12	MF	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER1	5,742.99	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352750_2019_12	MF	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER2	199.41	Cooling Res ER2	0.0009474181	0.188925	12.0	\$0.00	
352750_2019_12	MF	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER2	5,742.99	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352751_2019_12	Mfc	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER1_CompE	923.42	Cooling Res	0.0009474181	0.874865	6.0	\$730.10	2.8
352751_2019_12	Mfc	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER1_CompE	1,957.84	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352751_2019_12	Mfc	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER2_CompE	145.03	Cooling Res ER2	0.0009474181	0.137404	12.0	\$0.00	
352751_2019_12	Mfc	ASHP SEER 15 MF ER replace Elec Resist Furnace: HVAC ER2_CompE	1,957.84	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352800_2019_12	MF	ASHP SEER 15 MF replace at Fall Elec Resist Furnace: HVAC	196.21	Cooling Res	0.0009474181	0.185893	18.0	\$303.00	2.6
352800_2019_12	MF	ASHP SEER 15 MF replace at Fall Elec Resist Furnace: HVAC	5,369.26	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352801_2019_12	Mfc	ASHP SEER 15 MF replace at Fall Elec Resist Furnace: HVAC_CompE	219.54	Cooling Res	0.0009474181	0.207996	18.0	\$303.00	2.6
352801_2019_12	Mfc	ASHP SEER 15 MF replace at Fall Elec Resist Furnace: HVAC_CompE	2,816.04	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352850_2019_12	MF	ASHP SEER 16 MF ER replace ASHP: HVAC ER1	1,287.24	Cooling Res	0.0009474181	1.219554	6.0	\$950.52	3.3
352850_2019_12	MF	ASHP SEER 16 MF ER replace ASHP: HVAC ER1	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352850_2019_12	MF	ASHP SEER 16 MF ER replace ASHP: HVAC ER2	199.71	Cooling Res ER2	0.0009474181	0.189209	12.0	\$0.00	
352850_2019_12	MF	ASHP SEER 16 MF ER replace ASHP: HVAC ER2	642.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
352851_2019_12	Mfc	ASHP SEER 16 MF ER replace ASHP: HVAC ER1_CompE	936.17	Cooling Res	0.0009474181	0.886944	6.0	\$950.52	3.3
352851_2019_12	Mfc	ASHP SEER 16 MF ER replace ASHP: HVAC ER1_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
352851_2019_12	Mfc	ASHP SEER 16 MF ER replace ASHP: HVAC ER2_CompE	145.25	Cooling Res ER2	0.0009474181	0.137612	12.0	\$0.00	
352851_2019_12	Mfc	ASHP SEER 16 MF ER replace ASHP: HVAC ER2_CompE	219.07	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)
352900_2019_12	MF	ASHP - SEER 16 - replace on fall MF	199.71	Cooling Res	0.0009474181	0.189209	18.0	\$438.00	3.3
352900_2019_12	MF	ASHP - SEER 16 - replace on fall MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352901_2019_12	Mfc	ASHP - SEER 16 - replace on fall MF_CompE	145.25	Cooling Res	0.0009474181	0.137612	18.0	\$438.00	3.3
352901_2019_12	Mfc	ASHP - SEER 16 - replace on fall MF_CompE	261.37	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352950_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC MF	245.36	Cooling Res	0.0000941181	0.232459	18.0	\$438.00	2.0
352950_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC MF	4,307.18	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
352951_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC MF_CompE	178.45	Cooling Res	0.0009474181	0.169067	18.0	\$438.00	2.0
352951_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC MF_CompE	1,468.36	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353000_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER1	1,329.60	Cooling Res	0.0009474181	1.259687	6.0	\$950.52	3.3
353000_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER1	6,102.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353000_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER2	364.98	Cooling Res ER2	0.0009474181	0.345789	12.0	\$0.00	
353000_2019_12	MF	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER2	6,102.76	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353001_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER1_CompE	966.98	Cooling Res	0.0009474181	0.916134	6.0	\$950.52	3.3
353001_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER1_CompE	2,080.49	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353001_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER2_CompE	265.44	Cooling Res ER2	0.0009474181	0.251483	12.0	\$0.00	
353001_2019_12	Mfc	ASHP - SEER 16 - replace electric furnace / CAC - early replacement MF ER2_CompE	2,080.49	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353050_2019_12	MF	ASHP SEER 15 - replace on Fall MF	109.34	Cooling Res	0.0009474181	0.103591	18.0	\$303.00	3.1
353050_2019_12	MF	ASHP SEER 15 - replace on Fall MF	253.53	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353051_2019_12	Mfc	ASHP SEER 15 - replace on Fall MF_CompE	79.52	Cooling Res	0.0009474181	0.075339	18.0	\$303.00	3.1
353051_2019_12	Mfc	ASHP SEER 15 - replace on Fall MF_CompE	86.43	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353100_2019_12	SF	ASHP - SEER 17 - replace electric furnace / CAC SF	528.48	Cooling Res	0.0009474181	0.506892	18.0	\$724.00	2.8
353100_2019_12	SF	ASHP - SEER 17 - replace electric furnace / CAC SF	9,558.62	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353150_2019_12	MF	ASHP - SEER 17 - replace electric furnace / CAC MF	343.51	Cooling Res	0.0009474181	0.325448	18.0	\$724.00	2.8
353150_2019_12	MF	ASHP - SEER 17 - replace electric furnace / CAC MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353151_2019_12	Mfc	ASHP - SEER 17 - replace electric furnace / CAC MF_CompE	249.83	Cooling Res	0.0009474181	0.236693	18.0	\$724.00	2.8
353151_2019_12	Mfc	ASHP - SEER 17 - replace electric furnace / CAC MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353200_2019_12	SF	ASHP - SEER 18 - replace electric furnace / CAC SF	759.94	Cooling Res	0.0009474181	0.719981	18.0	\$962.92	3.0
353200_2019_12	SF	ASHP - SEER 18 - replace electric furnace / CAC SF	10,664.41	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353250_2019_12	MF	ASHP - SEER 18 - replace electric furnace / CAC MF	658.61	Cooling Res	0.0009474181	0.623979	18.0	\$962.92	4.0
353250_2019_12	MF	ASHP - SEER 18 - replace electric furnace / CAC MF	9,020.22	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353251_2019_12	Mfc	ASHP - SEER 18 - replace electric furnace / CAC MF_CompE	478.99	Cooling Res	0.0009474181	0.453804	18.0	\$962.92	4.0
353251_2019_12	Mfc	ASHP - SEER 18 - replace electric furnace / CAC MF_CompE	3,075.08	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353300_2019_12	SF	ASHP - SEER 19 - replace electric furnace / CAC SF	709.27	Cooling Res	0.0009474181	0.671975	18.0	\$1,203.65	2.8
353300_2019_12	SF	ASHP - SEER 19 - replace electric furnace / CAC SF	9,558.62	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353350_2019_12	MF	ASHP - SEER 19 - replace electric furnace / CAC MF	461.03	Cooling Res	0.0009474181	0.436788	18.0	\$1,203.65	2.8
353350_2019_12	MF	ASHP - SEER 19 - replace electric furnace / CAC MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353351_2019_12	Mfc	ASHP - SEER 19 - replace electric furnace / CAC MF_CompE	335.29	Cooling Res	0.0009474181	0.317660	18.0	\$1,203.65	2.8
353351_2019_12	Mfc	ASHP - SEER 19 - replace electric furnace / CAC MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353400_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC - early replacement SF ER1	2,264.43	Cooling Res	0.0009474181	2.145362	6.0	\$2,185.00	3.1
353400_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC - early replacement SF ER1	10,399.66	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353400_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC - early replacement SF ER2	870.34	Cooling Res ER2	0.0009474181	0.824576	12.0	\$0.00	
353400_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC - early replacement SF ER2	10,399.66	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353450_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC SF	898.41	Cooling Res	0.0009474181	0.851170	18.0	\$1,444.38	3.2
353450_2019_12	SF	ASHP - SEER 20 - replace electric furnace / CAC SF	10,924.14	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353500_2019_12	MF	ASHP - SEER 20 - replace electric furnace / CAC MF	583.97	Cooling Res	0.0009474181	0.553264	18.0	\$1,444.38	3.2
353500_2019_12	MF	ASHP - SEER 20 - replace electric furnace / CAC MF	7,100.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353501_2019_12	Mfc	ASHP - SEER 20 - replace electric furnace / CAC MF_CompE	424.70	Cooling Res	0.0009474181	0.402368	18.0	\$1,444.38	3.2
353501_2019_12	Mfc	ASHP - SEER 20 - replace electric furnace / CAC MF_CompE	2,420.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353550_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement SF ER1	2,341.40	Cooling Res	0.0009474181	2.218285	6.0	\$2,430.63	3.1
353550_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement SF ER1	10,399.66	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353550_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement SF ER2	947.31	Cooling Res ER2	0.0009474181	0.897499	12.0	\$0.00	
353550_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement SF ER2	10,399.66	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353600_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER1	1,521.91	Cooling Res	0.0009474181	1.441885	6.0	\$2,171.38	3.1
353600_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER1	6,759.78	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353600_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER2	615.75	Cooling Res ER2	0.0009474181	0.583373	12.0	\$0.00	
353600_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER2	6,759.78	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353601_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER1_CompE	1,106.84	Cooling Res	0.0009474181	1.048640	6.0	\$2,171.38	3.1
353601_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER1_CompE	2,304.47	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353601_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER2_CompE	447.82	Cooling Res ER2	0.0009474181	0.424273	12.0	\$0.00	
353601_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC - early replacement MF ER2_CompE	2,304.47	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353650_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC SF	977.86	Cooling Res	0.0009474181	0.926442	18.0	\$1,689.92	3.2
353650_2019_12	SF	ASHP - SEER 21 - replace electric furnace / CAC SF	10,924.14	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353700_2019_12	SF	ASHP - SEER 21+ replace at Fall Elec Resist Furnace MF	635.61	Cooling Res	0.0009474181	0.602188	18.0	\$1,689.92	3.2
353700_2019_12	SF	ASHP - SEER 21+ replace at Fall Elec Resist Furnace MF	7,100.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353701_2019_12	Mfc	ASHP - SEER 21+ replace at Fall Elec Resist Furnace MF_CompE	462.26	Cooling Res	0.0009474181	0.437953	18.0	\$1,689.92	3.2
353701_2019_12	Mfc	ASHP - SEER 21+ replace at Fall Elec Resist Furnace MF_CompE	2,420.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353750_2019_12	SF	ASHP SEER 17 replace ASHP - early replacement SF ER1	2,106.88	Cooling Res	0.0009474181	1.996096	6.0	\$1,512.49	3.3
353750_2019_12	SF	ASHP SEER 17 replace ASHP - early replacement SF ER1	2,767.32	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353750_2019_12	SF	ASHP SEER 17 replace ASHP - early replacement SF ER2	433.77	Cooling Res ER2	0.0009474181	0.410962	12.0	\$0.00	
353750_2019_12	SF	ASHP SEER 17 replace ASHP - early replacement SF ER2	988.63	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353800_2019_12	SF	ASHP SEER 17 replace ASHP - replace on fall SF	433.77	Cooling Res	0.0009474181	0.410962	18.0	\$724.00	3.3
353800_2019_12	SF	ASHP SEER 17 replace ASHP - replace on fall SF	1,179.52	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
353850_2019_12	SF	ASHP SEER 18 replace ASHP - early replacement SF ER1	2,735.03	Cooling Res	0.0009474181	2.591217	6.0	\$1,811.15	3.6
353850_2019_12	SF	ASHP SEER 18 replace ASHP - early replacement SF ER1	3,103.81	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
353850_2019_12	SF	ASHP SEER 18 replace ASHP - early replacement SF ER2	695.03	Cooling Res ER2	0.0009474181	0.658484	12.0	\$0.00	
353850_2019_12	SF	ASHP SEER 18 replace ASHP - early replacement SF ER2	1,190.36	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
353950_2019_12	SF	ASHP - SEER 18 - replace on fall SF	546.23	Cooling Res	0.0009474181	0.517508	18.0	\$962.92	3.3
353950_2019_12	SF	ASHP - SEER 18 - replace on fall SF	1,179.52	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

RESIDENTIAL HVAC

Air Source Heat Pumps

\*Mfc = Multifamily Comprehensive Envelope, CompE = Comprehensive Envelope

Table with columns: Measure Reference No., Program/Channel, Measure, kWh Annual Savings, End Use, kW Factor, kW, EUL, Inc. Cost, Units (tons/measure). Rows list various ASHP replacement measures (SF, MF, MFC) for different equipment types and their associated savings and costs.

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)
354700_2019_12	MF	ASHP SEER 20 replace ASHP - early replacement MF ER1	1,566.84	Cooling Res	0.0009474181	1.484453	6.0	\$1,956.90	3.3
354700_2019_12	MF	ASHP SEER 20 replace ASHP - early replacement MF ER1	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354700_2019_12	MF	ASHP SEER 20 replace ASHP - early replacement MF ER2	479.32	Cooling Res ER2	0.0009474181	0.454116	12.0	\$0.00	
354700_2019_12	MF	ASHP SEER 20 replace ASHP - early replacement MF ER2	642.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354701_2019_12	Mfc	ASHP SEER 20 replace ASHP - early replacement MF ER1_CompE	1,139.52	Cooling Res	0.0009474181	1.079602	6.0	\$1,956.90	3.3
354701_2019_12	Mfc	ASHP SEER 20 replace ASHP - early replacement MF ER1_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354701_2019_12	Mfc	ASHP SEER 20 replace ASHP - early replacement MF ER2_CompE	348.59	Cooling Res ER2	0.0009474181	0.330260	12.0	\$0.00	
354701_2019_12	Mfc	ASHP SEER 20 replace ASHP - early replacement MF ER2_CompE	219.07	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354750_2019_12	SF	ASHP SEER 21 replace ASHP - early replacement SF ER1	2,492.45	Cooling Res	0.0009474181	2.361392	6.0	\$2,478.42	3.3
354750_2019_12	SF	ASHP SEER 21 replace ASHP - early replacement SF ER1	2,767.32	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354750_2019_12	SF	ASHP SEER 21 replace ASHP - early replacement SF ER2	819.34	Cooling Res ER2	0.0009474181	0.776258	12.0	\$0.00	
354750_2019_12	SF	ASHP SEER 21 replace ASHP - early replacement SF ER2	988.63	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354800_2019_12	SF	ASHP SEER 21 replace ASHP - replace on fail SF	819.34	Cooling Res	0.0009474181	0.776258	18.0	\$1,689.92	3.3
354800_2019_12	SF	ASHP SEER 21 replace ASHP - replace on fail SF	1,179.52	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354850_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC MF	556.16	Cooling Res	0.0009474181	0.526916	18.0	\$1,689.92	2.8
354850_2019_12	MF	ASHP - SEER 21 - replace electric furnace / CAC MF	6,213.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354851_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC MF_CompE	404.48	Cooling Res	0.0009474181	0.383212	18.0	\$1,689.92	2.8
354851_2019_12	Mfc	ASHP - SEER 21 - replace electric furnace / CAC MF_CompE	2,118.10	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354900_2019_12	MF	ASHP SEER 21 replace ASHP - early replacement MF ER1	1,620.10	Cooling Res	0.0009474181	1.534912	6.0	\$2,202.45	3.3
354900_2019_12	MF	ASHP SEER 21 replace ASHP - early replacement MF ER1	1,798.76	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354900_2019_12	MF	ASHP SEER 21 replace ASHP - early replacement MF ER2	532.57	Cooling Res ER2	0.0009474181	0.504566	12.0	\$0.00	
354900_2019_12	MF	ASHP SEER 21 replace ASHP - early replacement MF ER2	642.61	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354901_2019_12	Mfc	ASHP SEER 21 replace ASHP - early replacement MF ER1_CompE	1,178.25	Cooling Res	0.0009474181	1.116295	6.0	\$2,202.45	3.3
354901_2019_12	Mfc	ASHP SEER 21 replace ASHP - early replacement MF ER1_CompE	613.21	Heating Res	0.0000000000	0.000000	6.0	\$0.00	
354901_2019_12	Mfc	ASHP SEER 21 replace ASHP - early replacement MF ER2_CompE	387.33	Cooling Res ER2	0.0009474181	0.366963	12.0	\$0.00	
354901_2019_12	Mfc	ASHP SEER 21 replace ASHP - early replacement MF ER2_CompE	219.07	Heating Res ER2	0.0000000000	0.000000	12.0	\$0.00	
354950_2019_12	MF	ASHP - SEER 17 - replace on fail MF	281.95	Cooling Res	0.0009474181	0.267125	18.0	\$724.00	3.3
354950_2019_12	MF	ASHP - SEER 17 - replace on fail MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
354951_2019_12	Mfc	ASHP - SEER 17 - replace on fail MF_CompE	205.05	Cooling Res	0.0009474181	0.194268	18.0	\$724.00	3.3
354951_2019_12	Mfc	ASHP - SEER 17 - replace on fail MF_CompE	261.37	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355000_2019_12	MF	ASHP - SEER 18 - replace on fail MF	355.05	Cooling Res	0.0009474181	0.336381	18.0	\$962.92	3.3
355000_2019_12	MF	ASHP - SEER 18 - replace on fail MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355001_2019_12	Mfc	ASHP - SEER 18 - replace on fail MF_CompE	397.26	Cooling Res	0.0009474181	0.376371	18.0	\$962.92	3.3
355001_2019_12	Mfc	ASHP - SEER 18 - replace on fail MF_CompE	402.11	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355050_2019_12	MF	ASHP - SEER 19 - replace on fail MF	420.45	Cooling Res	0.0009474181	0.398342	18.0	\$1,203.65	3.3
355050_2019_12	MF	ASHP - SEER 19 - replace on fail MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355051_2019_12	Mfc	ASHP - SEER 19 - replace on fail MF_CompE	305.78	Cooling Res	0.0009474181	0.289702	18.0	\$1,203.65	3.3
355051_2019_12	Mfc	ASHP - SEER 19 - replace on fail MF_CompE	261.37	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355100_2019_12	MF	ASHP - SEER 20 - replace on fail MF	479.32	Cooling Res	0.0009474181	0.454116	18.0	\$1,444.38	3.3
355100_2019_12	MF	ASHP - SEER 20 - replace on fail MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355101_2019_12	Mfc	ASHP - SEER 20 - replace on fail MF_CompE	348.59	Cooling Res	0.0009474181	0.330260	18.0	\$1,444.38	3.3
355101_2019_12	Mfc	ASHP - SEER 20 - replace on fail MF_CompE	261.37	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355150_2019_12	MF	ASHP - SEER 21 - replace on fail MF	532.57	Cooling Res	0.0009474181	0.504566	18.0	\$1,689.92	3.3
355150_2019_12	MF	ASHP - SEER 21 - replace on fail MF	766.69	Heating Res	0.0000000000	0.000000	18.0	\$0.00	
355151_2019_12	Mfc	ASHP - SEER 21 - replace on fail MF_CompE	387.33	Cooling Res	0.0009474181	0.366963	18.0	\$1,689.92	3.3
355151_2019_12	Mfc	ASHP - SEER 21 - replace on fail MF_CompE	261.37	Heating Res	0.0000000000	0.000000	18.0	\$0.00	

RESIDENTIAL INCOME ELIGIBLE

AC Tune-up

*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		
400050_2019_12	SFU	AC General Tune-Up (no charge or coil clean) SF	142.51	Cooling RES	0.0009474181	0.135017	2.0	\$70.00	per measure		
400100_2019_12	MFLU	AC General Tune-Up (no charge or coil clean) MF	92.63	Cooling RES	0.0009474181	0.087758	2.0	\$70.00	per measure		
400101_2019_12	MFLic	AC General Tune-Up (no charge or coil clean) MF_CompE	67.37	Cooling RES	0.0009474181	0.063828	2.0	\$70.00	per measure		
400150_2019_12	SFU	AC Tune-up / Refrigerant charge SF	594.39	Cooling RES	0.0009474181	0.563136	2.0	\$81.00	per measure		
400200_2019_12	MFLU	AC Tune-up / Refrigerant charge MF	386.36	Cooling RES	0.0009474181	0.366044	2.0	\$81.00	per measure		
400201_2019_12	MFLic	AC Tune-up / Refrigerant charge MF_CompE	280.99	Cooling RES	0.0009474181	0.266215	2.0	\$81.00	per measure		
400250_2019_12	SFU	AC Tune-up / Indoor Coil (Evaporator) Cleaning SF	98.38	Cooling RES	0.0009474181	0.093207	2.0	\$63.00	per measure		
400300_2019_12	MFLU	AC Tune-up / Indoor Coil (Evaporator) Cleaning MF	63.95	Cooling RES	0.0009474181	0.060587	2.0	\$63.00	per measure		
400301_2019_12	MFLic	AC Tune-up / Indoor Coil (Evaporator) Cleaning MF_CompE	46.51	Cooling RES	0.0009474181	0.044064	2.0	\$63.00	per measure		
400350_2019_12	SFU	AC Tune-up / Outdoor Coil (Condenser) Cleaning SF	196.76	Cooling RES	0.0009474181	0.186414	2.0	\$31.00	per measure		
400400_2019_12	MFLU	AC Tune-up / Outdoor Coil (Condenser) Cleaning MF	127.89	Cooling RES	0.0009474181	0.121165	2.0	\$31.00	per measure		
400401_2019_12	MFLic	AC Tune-up / Outdoor Coil (Condenser) Cleaning MF_CompE	93.01	Cooling RES	0.0009474181	0.088119	2.0	\$31.00	per measure		

Air Sealing

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units (sq. ft)
400450_2019_12	MFLU	Air Sealing (Infiltration reduction) - 30% MF LI DI electric furnace base	0.33	Building Shell RES	0.0004660805	0.29	0.04	0.000154	15.0	\$0.12	1.0
400500_2019_12	MFLU	Air Sealing (Infiltration reduction) - 30% MF LI DI heat pump base	0.25	Building Shell RES	0.0004660805	0.21	0.04	0.000117	15.0	\$0.12	1.0
400550_2019_12	SFU	Air Sealing (Infiltration reduction) - 30% SF LI DI electric furnace base	0.36	Building Shell RES	0.0004660805	0.31	0.05	0.000168	15.0	\$0.12	1.0
400551_2019_12	SFU	Air Sealing (Infiltration reduction) - 30% SF LI DI gas furnace base	0.06	Building Shell RES	0.0004660805	0.01	0.05	0.000028	15.0	\$0.12	1.0
400600_2019_12	SFU	Air Sealing (Infiltration reduction) - 30% SF LI DI heat pump base	0.31	Building Shell RES	0.0004660805	0.26	0.05	0.000144	15.0	\$0.12	1.0
400650_2019_12	SFU	MH Adjusted Air Sealing (Infiltration reduction) - 30% SF LI DI electric furnace base	0.48	Building Shell RES	0.0004660805	0.41	0.06	0.000224	15.0	\$0.12	1.0
400651_2019_12	SFU	MH Adjusted Air Sealing (Infiltration reduction) - 30% SF LI DI heat pump base	0.45	Building Shell RES	0.0004660805	0.39	0.06	0.000210	15.0	\$0.12	1.0
400652_2019_12	SFU	MH Adjusted Air Sealing (Infiltration reduction) - 30% SF LI DI gas furnace base	0.08	Building Shell RES	0.0004660805	0.02	0.06	0.000037	15.0	\$0.12	1.0

Ceiling Insulation

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units - area of ceiling/attic (ft2)
400700_2019_12	MFLU	Ceiling Insulation R11-R49 MF LI DI electric furnace base	1.06	Building Shell RES	0.0004660805	1.0	0.10	0.000494	25.0	\$2.12	1.0
400750_2019_12	MFLU	Ceiling Insulation R11-R49 MF LI DI heat pump base	0.66	Building Shell RES	0.0004660805	0.5	0.11	0.000308	25.0	\$2.12	1.0
400800_2019_12	MFLU	Ceiling Insulation R11-R49 MF LI DI gas heat electric cool base	0.14	Building Shell RES	0.0004660805	0.0	0.10	0.000065	25.0	\$2.12	1.0
400850_2019_12	SFU	Ceiling Insulation R11-R49 SF LI DI electric furnace base	1.06	Building Shell RES	0.0004660805	1.0	0.10	0.000494	25.0	\$2.12	1.0
400900_2019_12	SFU	Ceiling Insulation R11-R49 SF LI DI heat pump base	0.66	Building Shell RES	0.0004660805	0.5	0.11	0.000308	25.0	\$2.12	1.0
400950_2019_12	SFU	Ceiling Insulation R11-R49 SF LI DI gas heat electric cool base	0.14	Building Shell RES	0.0004660805	0.0	0.10	0.000065	25.0	\$2.12	1.0
401000_2019_12	MFLU	Ceiling Insulation R5-R30 MF LI DI electric furnace base	1.71	Building Shell RES	0.0004660805	1.6	0.16	0.000797	25.0	\$1.16	1.0
401050_2019_12	MFLU	Ceiling Insulation R5-R30 MF LI DI heat pump base	1.07	Building Shell RES	0.0004660805	0.9	0.18	0.000499	25.0	\$1.16	1.0
401100_2019_12	MFLU	Ceiling Insulation R5-R30 MF LI DI gas heat electric cool base	0.23	Building Shell RES	0.0004660805	0.1	0.16	0.000107	25.0	\$1.16	1.0
401150_2019_12	SFU	Ceiling Insulation R5-R30 SF LI DI electric furnace base	1.71	Building Shell RES	0.0004660805	1.6	0.16	0.000797	25.0	\$1.16	1.0
401200_2019_12	SFU	Ceiling Insulation R5-R30 SF LI DI heat pump base	1.07	Building Shell RES	0.0004660805	0.9	0.18	0.000499	25.0	\$1.16	1.0
401250_2019_12	SFU	Ceiling Insulation R5-R30 SF LI DI gas heat electric cool base	0.23	Building Shell RES	0.0004660805	0.1	0.16	0.000107	25.0	\$1.16	1.0
401300_2019_12	MFLU	Ceiling Insulation R5-R38 MF LI DI electric furnace base	1.84	Building Shell RES	0.0004660805	1.7	0.17	0.000858	25.0	\$1.68	1.0
401350_2019_12	MFLU	Ceiling Insulation R5-R38 MF LI DI heat pump base	1.15	Building Shell RES	0.0004660805	1.0	0.19	0.000536	25.0	\$1.68	1.0
401400_2019_12	MFLU	Ceiling Insulation R5-R38 MF LI DI gas heat electric cool base	0.25	Building Shell RES	0.0004660805	0.1	0.17	0.000117	25.0	\$1.68	1.0
401450_2019_12	SFU	Ceiling Insulation R5-R38 SF LI DI electric furnace base	1.84	Building Shell RES	0.0004660805	1.7	0.17	0.000858	25.0	\$1.68	1.0
401500_2019_12	SFU	Ceiling Insulation R5-R38 SF LI DI heat pump base	1.15	Building Shell RES	0.0004660805	1.0	0.19	0.000536	25.0	\$1.68	1.0
401550_2019_12	SFU	Ceiling Insulation R5-R38 SF LI DI gas heat electric cool base	0.25	Building Shell RES	0.0004660805	0.1	0.17	0.000117	25.0	\$1.68	1.0
401600_2019_12	MFLU	Ceiling Insulation R5-R49 MF LI DI electric furnace base	1.96	Building Shell RES	0.0004660805	1.8	0.19	0.000914	25.0	\$2.57	1.0
401650_2019_12	MFLU	Ceiling Insulation R5-R49 MF LI DI heat pump base	1.22	Building Shell RES	0.0004660805	1.0	0.20	0.000569	25.0	\$2.57	1.0
401700_2019_12	MFLU	Ceiling Insulation R5-R49 MF LI DI gas heat electric cool base	0.26	Building Shell RES	0.0004660805	0.1	0.19	0.000121	25.0	\$2.57	1.0
401750_2019_12	SFU	Ceiling Insulation R5-R49 SF LI DI electric furnace base	1.96	Building Shell RES	0.0004660805	1.8	0.19	0.000914	25.0	\$2.57	1.0
401800_2019_12	SFU	Ceiling Insulation R5-R49 SF LI DI heat pump base	1.22	Building Shell RES	0.0004660805	1.0	0.20	0.000569	25.0	\$2.57	1.0
401850_2019_12	SFU	Ceiling Insulation R5-R49 SF LI DI gas heat electric cool base	0.26	Building Shell RES	0.0004660805	0.1	0.19	0.000121	25.0	\$2.57	1.0
401900_2019_12	MFLU	Ceiling Insulation R5-R60 MF LI DI electric furnace base	2.03	Building Shell RES	0.0004660805	1.8	0.19	0.000946	25.0	\$3.42	1.0
401950_2019_12	MFLU	Ceiling Insulation R5-R60 MF LI DI heat pump base	1.27	Building Shell RES	0.0004660805	1.1	0.21	0.000592	25.0	\$3.42	1.0
402000_2019_12	MFLU	Ceiling Insulation R5-R60 MF LI DI gas heat electric cool base	0.27	Building Shell RES	0.0004660805	0.1	0.19	0.000126	25.0	\$3.42	1.0
402050_2019_12	SFU	Ceiling Insulation R5-R60 SF LI DI electric furnace base	2.03	Building Shell RES	0.0004660805	1.8	0.19	0.000946	25.0	\$3.42	1.0
402100_2019_12	SFU	Ceiling Insulation R5-R60 SF LI DI heat pump base	1.27	Building Shell RES	0.0004660805	1.1	0.21	0.000592	25.0	\$3.42	1.0
402150_2019_12	SFU	Ceiling Insulation R5-R60 SF LI DI gas heat electric cool base	0.27	Building Shell RES	0.0004660805	0.1	0.19	0.000126	25.0	\$3.42	1.0

Floor Insulation

*MH = Mobile Home											
Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	Heating kWh	Cooling kWh	kW	EUL	Inc. Cost	Units - area of floor (ft2)
402200_2019_12	SFU	Floor Insulation R25 (R-3.96 base) MH electric furnace/baseboard and electric cooling	2.45	Building Shell RES	0.0004660805	2.21	0.23	0.001142	25.0	\$0.68	1.0
402201_2019_12	SFU	Floor Insulation R25 (R-3.96 base) MH heat pump and electric cooling	1.42	Building Shell RES	0.0004660805	1.19	0.23	0.000662	25.0	\$0.68	1.0
402202_2019_12	SFU	Floor Insulation R25 (R-3.96 base) MH gas furnace/baseboard and electric cooling	0.23	Building Shell RES	0.0004660805	0.00	0.23	0.000107	25.0	\$0.68	1.0
402203_2020_02	SFU	Floor Insulation R25 (R-13 base) MH electric furnace/baseboard and electric cooling	0.22	Building Shell RES	0.0004660805	0.20	0.02	0.000103	25.0	\$0.68	1.0
402204_2020_02	SFU	Floor Insulation R25 (R-13 base) MH heat pump and electric cooling	0.13	Building Shell RES	0.0004660805	0.11	0.02	0.000061	25.0	\$0.68	1.0
402205_2020_02	SFU	Floor Insulation R25 (R-13 base) MH gas furnace/baseboard and electric cooling	0.02	Building Shell RES	0.0004660805	0.00	0.02	0.000009	25.0	\$0.68	1.0

Dirty Filter Alarm

*MFLic = Multifamily Low Income 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	MFLU	Dirty Filter Alarm_MFLU	102.68	HVAC RES	0.0004660805	65.0	37.7	0.047857	14.0	\$5.00	per measure
402251_2019_12	MFLic	Dirty Filter Alarm_MFLU_CompE	49.58	HVAC RES	0.0004660805	22.1	27.4	0.023108	14.0	\$5.00	per measure

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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	SFLI	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	SFLI	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	SFLI	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	SFLI	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_2019_12	SFLI	Duct Repair (Sealing) - Gas Heating SF	1.02	HVAC RES	0.0004660805	0.8	0.2	0.000475	20.0	\$8.04	1.0
402452_2020_12	MFLI	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_2020_12	MFLI	Duct Repair (Sealing) - Gas Heating MF Adjusted	0.89	HVAC RES	0.0004660805	0.70	0.19	0.000415	20.0	\$8.04	1.0
402500_2019_12	SFLI	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_2019_12	SFLI	Duct Repair (Sealing) - Gas Heating MH Adjusted	1.21	HVAC RES	0.0004660805	1.0	0.3	0.000564	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_2019_12	SFLI	ECM Auto Fan EUL Replacement -SF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	20	\$74.33	per measure
402600_2019_12	SFLI	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_2019_12	SFLI	ECM Auto Fan Early Replacement ER2 (Remaining Life) - SF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	12	\$0.00	per measure
402650_2019_12	SFLI	ECM Continuous Fan EUL Replacement - SF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259	20	\$74.33	per measure
402700_2019_12	SFLI	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_2019_12	SFLI	ECM Continuous Fan Early Replacement ER2 (Remaining Life) - SF	582.00	HVAC RES ER2	0.0004660805	264.1	31.1	0.0	286.7	0.271259	12	\$0.00	per measure
402750_2019_12	MFLI	ECM Auto Fan EUL Replacement - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	286.7	0.0	0.271259	20	\$74.33	per measure
402800_2019_12	MFLI	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_2019_12	MFLI	ECM Auto Fan Early Replacement ER2 (Remaining Life) - MF	582.00	HVAC RES ER2	0.0004660805	264.1	31.1	286.7	0.0	0.271259	12	\$0.00	per measure
402850_2019_12	MFLI	ECM Continuous Fan EUL Replacement - MF	582.00	HVAC RES	0.0004660805	264.1	31.1	0.0	286.7	0.271259	20	\$74.33	per measure
402900_2019_12	MFLI	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_2019_12	MFLI	ECM Continuous Fan Early Replacement ER2 (Remaining Life) - MF	582.00	HVAC RES ER2	0.0004660805	264.1	31.1	0.0	286.7	0.271259	12	\$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(v)). 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.

Heat Pump (HP) Tune-up

\*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
402950_2019_12	SFLI	General HP tune-up (no charge or coil clean)	146.06	Cooling RES	0.0009474181	0.138380	2.0	\$70.00	per measure
402950_2019_12	SFLI	General HP tune-up (no charge or coil clean)	117.55	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403000_2019_12	MFLI	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	MFLI	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	SFLI	HP tune-up / Refrigerant charge SF	609.19	Cooling RES	0.0009474181	0.577158	2.0	\$81.00	per measure
403050_2019_12	SFLI	HP tune-up / Refrigerant charge SF	565.92	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403100_2019_12	MFLI	HP tune-up / Refrigerant charge MF	364.03	Cooling RES	0.0009474181	0.344889	2.0	\$81.00	per measure
403100_2019_12	MFLI	HP tune-up / Refrigerant charge MF	338.18	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403101_2019_12	MFLic	HP tune-up / Refrigerant charge MF_CompE	264.75	Cooling RES	0.0009474181	0.250829	2.0	\$81.00	per measure
403101_2019_12	MFLic	HP tune-up / Refrigerant charge MF_CompE	115.29	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403150_2019_12	SFLI	HP tune-up / Indoor Coil (Evaporator) Cleaning SF	100.83	Cooling RES	0.0009474181	0.095528	2.0	\$63.00	per measure
403150_2019_12	SFLI	HP tune-up / Indoor Coil (Evaporator) Cleaning SF	80.11	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403200_2019_12	MFLI	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	MFLI	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	MFLic	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	MFLic	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	SFLI	HP tune-up / Outdoor Coil (Condenser) Cleaning SF	201.65	Cooling RES	0.0009474181	0.191047	2.0	\$31.00	per measure
403250_2019_12	SFLI	HP tune-up / Outdoor Coil (Condenser) Cleaning SF	164.95	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure
403300_2019_12	MFLI	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	MFLI	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	MFLic	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	MFLic	HP tune-up / Outdoor Coil (Condenser) Cleaning MF_CompE	33.60	Heating RES	0.0000000000	0.000000	2.0	\$0.00	per measure

Low Flow Faucet Aerators (Bathroom)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
403350_2019_12	MFLI	Low Flow Bathroom Faucet Aerator MFLI	37.02	Water heating RES	0.0000887318	0.047	0.003285	11.0	\$3.00	per measure
403351_2020_12	SFLI	Low Flow Bathroom Faucet Aerator SFLI	37.02	Water heating RES	0.0000887318	0.047	0.003285	11.0	\$3.00	per measure
403400_2019_12	MFLI DI	Low Flow Bathroom Faucet Aerator MFLI DI	35.17	Water heating RES	0.0000887318	0.047	0.003121	11.0	\$11.33	per measure
403450_2019_12	SFLI DI	Low Flow Bathroom Faucet Aerator SFLI 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	MFLI	Low Flow Kitchen Faucet Aerator MFLI	116.88	Water Heating RES	0.0000887318	0.079	0.010371	11.0	\$3.00	per measure
403471_2020_12	SFLI	Low Flow Kitchen Faucet Aerator SFLI	116.88	Water Heating RES	0.0000887318	0.079	0.010371	11.0	\$3.00	per measure
403480_2020_12	MFLI DI	Low Flow Kitchen Faucet Aerator MFLI DI	111.03	Water Heating RES	0.0000887318	0.079	0.009852	11.0	\$11.33	per measure
403481_2020_12	SFLI DI	Low Flow Kitchen Faucet Aerator SFLI DI	111.03	Water Heating RES	0.0000887318	0.079	0.009852	11.0	\$11.33	per measure

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Low Flow Showerheads

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
403500_2019_12_	MFLI	Low Flow Showerhead MFLI	220.17	Water heating RES	0.0000887318	0.109	0.019536	10.0	\$7.00	per measure
403550_2019_12_	MFLI DI	Low Flow Showerhead MFLI DI	232.35	Water heating RES	0.0000887318	0.109	0.020617	10.0	\$12.98	per measure
403551_2019_12_	MFLI DI	Low Flow Handheld Showerhead MFLI DI	232.35	Water heating RES	0.0000887318	0.109	0.020617	10.0	\$12.47	per measure
403600_2019_12_	SFLI DI	Low Flow Showerhead SFLI DI	194.58	Water heating RES	0.0000887318	1.856	0.017265	10.0	\$12.98	per measure
403601_2019_12_	SFLI DI	Low Flow Handheld Showerhead SFLI DI	194.58	Water heating RES	0.0000887318	1.856	0.017265	10.0	\$18.45	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_	MFLI	Pipe Insulation MFLI	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$7.10	per foot
403700_2019_12_	MFLI DI	Pipe Insulation MFLI DI	4.64	Water heating RES	0.0000887318	0.000412	12.0	\$5.66	per foot
403750_2019_12_	SFLI DI	Pipe Insulation SFLI 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_	MFLI	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_	MFLI	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_	MFLIC	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_	MFLIC	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_	SFLI	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_	SFLI	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_	MFLI	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_	MFLI	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_	MFLIC	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_	MFLIC	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_	SFLI	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_	SFLI	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_	MFLI	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_	MFLI	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_	MFLIC	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_	MFLIC	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_	SFLI	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_	SFLI	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_	MFLI	Setback thermostat - full setback - Unknown MF	201.39	Cooling RES	0.0009474181	0.190801	10.0	\$70.00	per measure
404100_2019_12_	MFLI	Setback thermostat - full setback - Unknown MF	15.49	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404101_2019_12_	MFLI	Setback thermostat - full setback - Unknown MF_CompE	146.46	Cooling RES	0.0009474181	0.138759	10.0	\$70.00	per measure
404101_2019_12_	MFLI	Setback thermostat - full setback - Unknown MF_CompE	5.28	Heating RES	0.0000000000	0.000000	10.0	\$0.00	per measure
404150_2019_12_	SFLI	Setback thermostat for SF - full setback - Unknown	358.20	Cooling RES	0.0009474181	0.339365	10.0	\$70.00	per measure
404150_2019_12_	SFLI	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_	SFLI DI	Shower Start 1.5 gpm electric water heater SFLI DI	41.68	Water heating RES	0.0000887318	0.109	0.003698	10.0	\$50.00	per measure
404250_2019_12_	MFLI DI	Shower Start 1.5 gpm electric water heater MFLI 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_	SFLI	Water Heater Wrap SFLI	100.55	Water heating RES	0.0000887318	0.008922	12.0	\$58.00	per measure

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_	MFLI	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_	MFLI DI	Common Area Low Flow Showerhead	213.29	Water heating RES	0.0000887318	0.109	0.018926	10.0	\$7.00	per measure

RESIDENTIAL INCOME ELIGIBLE

Lighting

\*\* CFL baseline is Post 2021, EISA baseline is pre-2021 \*\*

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use - RES	kW Factor - RES	End Use - BUS	kW Factor - BUS	kWh RES	kWh BUS	kW	EUL - RES	EUL - BUS**	Inc. Cost*		Units
													SF	MF	
404450_2019_12	SFU / MFLU	LED - 10.5W Downlight E26 (EISA baseline) LI DI	23.59	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.6	0.0000000	0.003521	19.0	6.0	\$6.00	\$3.30	per measure
404500_2019_12	SFU / MFLU	LED - 10W (Halogen baseline) (750-1049 lumens) LID1	22.22	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	SFU / MFLU	LED - 12W (Halogen baseline) LI DI	22.95	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_2019_12	SFU / MFLU	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent) LI DI	27.52	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.5	0.0000000	0.004108	19.0	6.0	\$6.00	\$3.53	per measure
404650_2019_12	SFU / MFLU	LED - 15W (Halogen baseline) (1050-1489 lumens) LID1	27.79	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	SFU / MFLU	LED - 11W Flood Light BR30 Bulb (Halogen baseline) LI DI	28.84	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	28.8	0.0000000	0.004304	19.0	6.0	\$10.00	\$4.92	per measure
404700_2019_12	SFU / MFLU	LED - 15W Flood Light PAR30 Bulb (Halogen baseline) LI DI	26.87	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	SFU / MFLU	LED - 18W Flood Light PAR38 Bulb (Halogen baseline) LI DI	34.73	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	SFU / MFLU	LED - 20W (Halogen baseline) (1490-2600 lumens) LID1	37.35	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	SFU / MFLU	LED - 4W Candelabra (Replacing Specialty Incandescent) LI DI	23.53	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	SFU / MFLU	LED - 4W Candelabra (CFL baseline) LID1	2.95	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_2019_12	SFU / MFLU	LED - 8W Globe Light G25 Bulb (Replacing Specialty Incandescent) LI DI	14.42	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	14.4	0.0000000	0.002152	19.0	6.0	\$7.00	\$3.27	per measure
405000_2019_12	SFU / MFLU	LED - 8W Globe Light G25 Bulb (Replacing CFL) LID1	2.62	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.6	0.0000000	0.000391	19.0	6.0	\$7.00	\$3.27	per measure
405050_2019_12	SFU / MFLU	LED - 10W (CFL baseline) (750-1049 lumens) LID1	2.82	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	2.8	0.0000000	0.000421	19.0	6.0	\$6.00	\$3.68	per measure
405100_2019_12	SFU / MFLU	LED - 10.5W Downlight E26 (CFL baseline) LID1	8.52	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	8.5	0.0000000	0.001272	19.0	6.0	\$6.00	\$3.30	per measure
405150_2019_12	SFU / MFLU	LED - 12W Dimmable Light Bulb (Replacing CFL) LID1	5.57	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.6	0.0000000	0.000831	19.0	6.0	\$6.00	\$3.53	per measure
405200_2019_12	SFU / MFLU	LED - 12W (Replacing CFL) LID1	5.57	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.6	0.0000000	0.000831	19.0	6.0	\$6.00	\$4.72	per measure
405250_2019_12	SFU / MFLU	LED - 15W (CFL baseline) (1050-1489 lumens) LID1	5.44	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.4	0.0000000	0.000812	19.0	6.0	\$8.00	\$6.27	per measure
405251_2020_12	SFU / MFLU	LED - 11W Flood Light BR30 Bulb (CFL baseline) LID1	5.17	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.2	0.0000000	0.000772	19.0	6.0	\$10.00	\$4.92	per measure
405300_2019_12	SFU / MFLU	LED - 15W Flood Light PAR30 Bulb (CFL baseline) LID1	3.15	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.1	0.0000000	0.000469	19.0	6.0	\$10.00	\$4.92	per measure
405350_2019_12	SFU / MFLU	LED - 18W Flood Light PAR38 Bulb (CFL baseline) LID1	3.28	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.3	0.0000000	0.000489	19.0	6.0	\$15.00	\$4.92	per measure
405400_2019_12	SFU / MFLU	LED - 20W (CFL baseline) (1490-2600 lumens) LID1	6.42	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.4	0.0000000	0.000959	19.0	6.0	\$8.00	\$7.83	per measure
405410_2019_12	SFU / MFLU	LED - 6W (Halogen baseline) (310-749 lumens) LID1	15.07	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	15.1	0.0000000	0.002250	19.0	6.0	\$7.00	\$3.27	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
405450_2019_12	SFU / MFLU	Advanced Tier 1 Power Strips / TOS/NC - Home Office	31.000	Miscellaneous RES	0.0001148238	0.003560	10.0	\$20.00	per measure
405451_2020_12	SFU / MFLU	Advanced Tier 1 Power Strips / Di - Home Office	31.000	Miscellaneous RES	0.0001148238	0.003560	10.0	\$30.00	per measure
405500_2019_12	SFU / MFLU	Advanced Tier 1 Power Strips / Kits - Home Office	24.180	Miscellaneous RES	0.0001148238	0.002776	10.0	\$20.00	per measure
405550_2019_12	SFU / MFLU	Advanced Tier 1 Power Strips / TOS/NC - Home Entertainment	75.100	Miscellaneous RES	0.0001148238	0.008623	10.0	\$20.00	per measure
405551_2020_12	SFU / MFLU	Advanced Tier 1 Power Strips / Di - Home Entertainment	75.100	Miscellaneous RES	0.0001148238	0.008623	10.0	\$30.00	per measure
405600_2019_12	SFU / MFLU	Advanced Tier 1 Power Strips / Kits - Home Entertainment	58.580	Miscellaneous RES	0.0001148238	0.006726	10.0	\$20.00	per measure
405650_2019_12	SFU / MFLU	Advanced Tier 1 Power Strips / TOS/NC - Unknown Location	59.220	Miscellaneous RES	0.0001148238	0.006800	10.0	\$20.00	per measure
405651_2020_12	SFU / MFLU	Advanced Tier 1 Power Strips / Di - Unknown Location	59.220	Miscellaneous RES	0.0001148238	0.006800	10.0	\$30.00	per measure
405700_2019_12	SFU / MFLU	Advanced Tier 1 Power / Kits - Unknown Location	42.070	Miscellaneous RES	0.0001148238	0.004831	10.0	\$20.00	per measure
405750_2019_12	SFU / MFLU	Advanced Tier 2 Power Strips / TOS/NC / Average	151.960	Miscellaneous RES	0.0001148238	0.017449	10.0	\$30.00	per measure
405751_2020_12	SFU / MFLU	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	SFU / MFLU	Refrigerator - early replacement ER1	564.66	Refrigeration RES	0.0001286107	0.072621	6.0	\$753.00	per measure
405800_2019_12	SFU / MFLU	Refrigerator - early replacement ER2	46.72	Refrigeration RES ER2	0.0001286107	0.006009	11.0	\$0.00	per measure
405825_2019_12	SFU / MFLU	Refrigerator - Pre 1993 - ER1	1269.91	Refrigeration RES	0.0001286107	0.163324	6.0	\$753.00	per measure
405825_2019_12	SFU / MFLU	Refrigerator - Pre 1993 - ER2	46.72	Refrigeration RES ER2	0.0001286107	0.006009	11.0	\$0.00	per measure

Energy Star Room AC

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
405850_2019_12	MFLU	AC - Energy Star Room - unknown size - Thru-Wall_MF	195.22	Cooling RES	0.0009474181	0.184955	9.0	\$20.00	per measure
405900_2019_12	SFU	AC - Energy Star Room - unknown size Thru-Wall_SF	76.92	Cooling RES	0.0009474181	0.072875	9.0	\$20.00	per measure
405950_2019_12	MFLU	AC - Energy Star Room - unknown size_MF	195.22	Cooling RES	0.0009474181	0.184955	9.0	\$20.00	per measure
406000_2019_12	SFU	AC - Energy Star Room - unknown size_SF	76.92	Cooling RES	0.0009474181	0.072875	9.0	\$20.00	per measure
405851_2019_12	MFLU	AC - Energy Star Room - 8kBTu - Thru-Wall_MF	83.11	Cooling RES	0.0009474181	0.078740	9.0	\$20.00	per measure
405901_2019_12	SFU	AC - Energy Star Room - 8kBTu - Thru-Wall_SF	37.26	Cooling RES	0.0009474181	0.035301	9.0	\$20.00	per measure
405951_2019_12	MFLU	AC - Energy Star Room - 8kBTu_MF	83.11	Cooling RES	0.0009474181	0.078740	9.0	\$20.00	per measure
406001_2019_12	SFU	AC - Energy Star Room - 8kBTu_SF	37.26	Cooling RES	0.0009474181	0.035301	9.0	\$20.00	per measure
405852_2019_12	MFLU	AC - Energy Star Room - 8kBTu - Thru-Wall_MF	132.97	Cooling RES	0.0009474181	0.125978	9.0	\$20.00	per measure
405902_2019_12	SFU	AC - Energy Star Room - 8kBTu - Thru-Wall_SF	59.61	Cooling RES	0.0009474181	0.056476	9.0	\$20.00	per measure
405952_2019_12	MFLU	AC - Energy Star Room - 8kBTu_MF	132.97	Cooling RES	0.0009474181	0.125978	9.0	\$20.00	per measure
406002_2019_12	SFU	AC - Energy Star Room - 8kBTu_SF	59.61	Cooling RES	0.0009474181	0.056476	9.0	\$20.00	per measure
405853_2019_12	MFLU	AC - Energy Star Room - 10kBTu - Thru-Wall_MF	166.22	Cooling RES	0.0009474181	0.157480	9.0	\$20.00	per measure
405903_2019_12	SFU	AC - Energy Star Room - 10kBTu - Thru-Wall_SF	74.52	Cooling RES	0.0009474181	0.070602	9.0	\$20.00	per measure
405953_2019_12	MFLU	AC - Energy Star Room - 10kBTu_MF	166.22	Cooling RES	0.0009474181	0.157480	9.0	\$20.00	per measure
406003_2019_12	SFU	AC - Energy Star Room - 10kBTu_SF	74.52	Cooling RES	0.0009474181	0.070602	9.0	\$20.00	per measure
405854_2019_12	MFLU	AC - Energy Star Room - 12kBTu - Thru-Wall_MF	199.46	Cooling RES	0.0009474181	0.188972	9.0	\$20.00	per measure
405904_2019_12	SFU	AC - Energy Star Room - 12kBTu - Thru-Wall_SF	89.42	Cooling RES	0.0009474181	0.084718	9.0	\$20.00	per measure
405954_2019_12	MFLU	AC - Energy Star Room - 12kBTu_MF	199.46	Cooling RES	0.0009474181	0.188972	9.0	\$20.00	per measure
406004_2019_12	SFU	AC - Energy Star Room - 12kBTu_SF	89.42	Cooling RES	0.0009474181	0.084718	9.0	\$20.00	per measure
405855_2019_12	MFLU	AC - Energy Star Room - 15kBTu - Thru-Wall_MF	249.32	Cooling RES	0.0009474181	0.236210	9.0	\$20.00	per measure
405905_2019_12	SFU	AC - Energy Star Room - 15kBTu - Thru-Wall_SF	111.77	Cooling RES	0.0009474181	0.105893	9.0	\$20.00	per measure
405955_2019_12	MFLU	AC - Energy Star Room - 15kBTu_MF	249.32	Cooling RES	0.0009474181	0.236210	9.0	\$20.00	per measure
406005_2019_12	SFU	AC - Energy Star Room - 15kBTu_SF	111.77	Cooling RES	0.0009474181	0.105893	9.0	\$20.00	per measure

RESIDENTIAL INCOME ELIGIBLE

Storm Window

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
406025_2020_12	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	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	SFLI / MFLU	Storm Window - Double Pane, Fixed - Gas Heating	0.96	Building Shell RES	0.0004660805	0.000446	20	\$9.29	per sq ft



RESIDENTIAL HOME ENERGY REPORT

Home Energy Report

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kW	EUL	Inc. Cost	Units
450050_2020_12_	SF	Home Energy Report	50.83	Building Shell RES	0.0004660805	0.0236900	1.0	\$0.00	per report

Source: Ameren MO PY19 Evaluation Report, Table 5-10 (PY2019 HER Program Adjusted Ex Post Net Annual Savings)

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_2019_12	MFMR	General Tune-Up (no charge or coil clean) / MFMR	80.33	Cooling RES	0.0009474181	0.076106	2.0	\$70.00	per measure
500051_2019_12	MFMRc	General Tune-Up (no charge or coil clean) / MFMR_CompE	58.42	Cooling RES	0.0009474181	0.055348	2.0	\$70.00	per measure
500100_2019_12	MFMR	AC Tune-up / refrigerant charge / MFMR	335.03	Cooling RES	0.0009474181	0.317413	2.0	\$81.00	per measure
500101_2019_12	MFMRc	AC Tune-up / refrigerant charge / MFMR_CompE	243.66	Cooling RES	0.0009474181	0.230848	2.0	\$81.00	per measure
500150_2019_12	MFMR	Indoor Coil (Evaporator) Cleaning / MFMR	55.45	Cooling RES	0.0009474181	0.052534	2.0	\$63.00	per measure
500151_2019_12	MFMRc	Indoor Coil (Evaporator) Cleaning / MFMR_CompE	40.33	Cooling RES	0.0009474181	0.038209	2.0	\$63.00	per measure
500200_2019_12	MFMR	Outdoor Coil (Condenser) Cleaning / MFMR	110.90	Cooling RES	0.0009474181	0.105069	2.0	\$31.00	per measure
500201_2019_12	MFMRc	Outdoor Coil (Condenser) Cleaning / MFMR_CompE	80.66	Cooling RES	0.0009474181	0.076419	2.0	\$31.00	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_2019_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_2019_12	MFMR	ECM Auto Fan Early Replacement ER2 (Remaining Life) - MFMR	582.00	HVAC RES ER2	0.0004660805	264.1	31.1	286.7	0.0	0.271259	12.0		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 430.32)(v). This code requirement effectively makes ECMs part of the baseline for New Construction (NC), Replace-on-Fall (ROF), Time-of-Replacement (TOS), and Early Replacement (EREP) scenarios.

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_2019_12	MFMR	LED - 10W (CFL baseline) (750-1049 lumens)	4.11	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	4.1	0.0	0.000613	19.0	6.0	\$2.03	per measure
500900_2019_12	MFMR	LED - 10W (Halogen baseline) (750-1049 lumens)	23.12	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	23.1	0.0	0.003451	19.0	6.0	\$2.03	per measure
500950_2019_12	MFMR	LED - 12W Dimmable Light Bulb (Replacing CFL)	5.46	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.5	0.0	0.000815	19.0	6.0	\$4.14	per measure
501000_2019_12	MFMR	LED - 12W Dimmable Light Bulb (Replacing Specialty Incandescent)	42.87	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	42.9	0.0	0.006399	19.0	6.0	\$4.14	per measure
501050_2019_12	MFMR	LED - 12W (Halogen baseline)	22.49	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	22.5	0.0	0.003357	19.0	6.0	\$4.72	per measure
501100_2019_12	MFMR	LED - 12W (Replacing CFL)	5.46	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.5	0.0	0.000815	19.0	6.0	\$4.72	per measure
501150_2019_12	MFMR	LED - 15W (Halogen baseline) (1050-1489 lumens)	27.23	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	27.2	0.0	0.004064	19.0	6.0	\$6.27	per measure
501200_2019_12	MFMR	LED - 15W (CFL baseline) (1050-1489 lumens)	5.33	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.3	0.0	0.000796	19.0	6.0	\$6.27	per measure
501250_2019_12	MFMR	LED - 20W (Halogen baseline) (1490-2600 lumens)	36.61	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	36.6	0.0	0.005464	19.0	6.0	\$7.83	per measure
501300_2019_12	MFMR	LED - 20W (CFL baseline) (1490-2600 lumens)	6.29	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	6.3	0.0	0.000939	19.0	6.0	\$7.83	per measure
501310_2020_12	MFMR	LED - 11W Flood Light BR30 Bulb (Halogen baseline)	34.68	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	34.7	0.0	0.005176	19.0	6.0	\$1.66	per measure
501311_2020_12	MFMR	LED - 11W Flood Light BR30 Bulb (CFL baseline)	5.07	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	5.1	0.0	0.000756	19.0	6.0	\$1.66	per measure
501350_2019_12	MFMR	LED - 15W Flood Light PAR30 Bulb (Halogen baseline)	32.31	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	32.3	0.0	0.004822	19.0	6.0	\$3.05	per measure
501400_2019_12	MFMR	LED - 15W Flood Light PAR30 Bulb (CFL baseline)	3.08	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	3.1	0.0	0.000460	19.0	6.0	\$3.05	per measure
501401_2019_12	MFMR	LED - 6W (Halogen baseline) (310-749 lumens)	14.77	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	14.8	0.0	0.002205	19.0	6.0	\$0.35	per measure
501450_2019_12	MFMR	LED Nightlights	22.00	Lighting RES	0.0001492529	Lighting BUS	0.0001899635	22.0	0.0	0.003284	19.0	6.0	\$0.35	per measure

Faucet Aerators (Kitchen)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
501500_2019_12	MFMR	Faucet Aerators (Kitchen) MFMR	115.90	Water Heating RES	0.000887318	0.079	0.010284	10.0	\$8.00	per measure

RESIDENTIAL MULTI-FAMILY MARKET RATE

Faucet Aerators (Bathroom)

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	EPG_electric	kW	EUL	Inc. Cost	Units
501550_2019_12_	MFMR	Faucet Aerators (Bathroom) MFMR	33.47	Water Heating RES	0.0000887318	0.062	0.002970	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_2019_12_	MFMR	Low Flow Showerhead MFMR	381.98	Water Heating RES	0.0000887318	0.109	0.033894	10.0	\$7.00	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

RESIDENTIAL MULTI-FAMILY MARKET RATE

High Efficiency Pool Pump

Measure Reference No.	Program/Channel	Measure	kWh Annual Savings	End Use	kW Factor	kWh <sub>h</sub> /Day	kWh <sub>m</sub> /Day	kWh <sub>y</sub> /Day	kW	EUL	Inc. Cost	Units
502400_2019_12_	MFMR	Variable Speed Pool Pump	2052.85	Pool Spa RES	0.0002354459	20.9760	1.58	2.52	0.483335	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	0.0001286107	0.073621	6.0	\$753.00	per measure
502450_2019_12_	MFMR	Refrigerator - early replacement ER2 (remaining life) - MFMR	46.72	Refrigeration RES ER2	0.0001286107	0.006009	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	0.0001286107	0.131224	8.0	\$140.00	per measure
550100_2019_12_	Appliance Recycling	Refrigerator recycling (post-1990)	520.00	Refrigeration RES	0.0001286107	0.066878	8.0	\$140.00	per measure

**Freezer**

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

Measure Reference No.	Program/Channel	Measure	Gross kWh Annual Savings	End Use	kW Factor	kW (Annual)*	EUL	Inc. Cost	Units
600050_2020_12	DR	Demand Response Advanced Thermostat	55.97	HVAC RES	-	-	11.0	\$0.00	per thermostat

\* 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 1.41 kW/thermostat is assumed based on the PY19 evaluation results.

**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.

**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.

**RESIDENTIAL**

Source: Ameren MO PY2019 Final Report

Demand Impact, Per Device: Table 4-13. Residential DR Program – Resource Capability Impacts  
 Optimization Energy Savings Summary, Per Device: Table 4-19. Residential DR Program – Device Optimization Energy Savings Summary