

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Efficient Products ¹	Specialty LED 2 Watt	Light bulb	6,800	21.9	0.004	148,743	26.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 3 Watt	Light bulb	33,320	21.0	0.004	698,275	124.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 4 Watt	Light bulb	62,488	34.1	0.006	2,132,988	380.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 5 Watt	Light bulb	30,589	33.3	0.006	1,018,614	181.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 6 Watt	Light bulb	23,200	32.4	0.006	751,640	134.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 7 Watt	Light bulb	30,409	31.6	0.006	961,652	171.4	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 8 Watt	Light bulb	235,735	49.5	0.009	11,659,260	2077.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 9 Watt	Light bulb	18,329	48.5	0.009	889,466	158.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 10 Watt	Light bulb	140,560	50.6	0.009	7,105,660	1266.4	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 11 Watt	Light bulb	14,243	60.9	0.011	866,717	154.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 12 Watt	Light bulb	8,418	59.9	0.011	504,507	89.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 13 Watt	Light bulb	12,785	59.0	0.011	753,941	134.4	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 14 Watt	Light bulb	11,771	58.1	0.010	683,434	121.8	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 15 Watt	Light bulb	3,192	57.4	0.010	183,170	32.7	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 16 Watt	Light bulb	2,435	79.9	0.014	194,541	34.7	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 17 Watt	Light bulb	1,344	78.9	0.014	106,095	18.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 18 Watt	Light bulb	2,376	78.0	0.014	185,293	33.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 19 Watt	Light bulb	1,782	77.0	0.014	137,275	24.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 23 Watt	Light bulb	239	120.8	0.022	28,867	5.1	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Specialty LED 26 Watt	Light bulb	99	117.9	0.021	11,675	2.1	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 4 Watt	Light bulb	20,607	23.8	0.004	489,952	87.3	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 5 Watt	Light bulb	167,347	22.9	0.004	3,826,318	681.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 6 Watt	Light bulb	121,198	21.9	0.004	2,653,958	473.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 7 Watt	Light bulb	110,469	21.1	0.004	2,327,250	414.8	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 8 Watt	Light bulb	392,588	33.3	0.006	13,074,537	2330.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 9 Watt	Light bulb	1,134,499	32.5	0.006	36,820,200	6562.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 10 Watt	Light bulb	240,422	31.5	0.006	7,569,063	1349.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 11 Watt	Light bulb	10,649	40.3	0.007	428,951	76.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 12 Watt	Light bulb	22,909	39.0	0.007	893,280	159.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 13 Watt	Light bulb	11,688	38.2	0.007	446,262	79.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 14 Watt	Light bulb	858	37.1	0.007	31,792	5.7	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 15 Watt	Light bulb	56,931	36.1	0.006	2,058,005	366.8	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 16 Watt	Light bulb	11,867	53.4	0.010	633,132	112.8	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 17 Watt	Light bulb	36,970	52.3	0.009	1,933,896	344.7	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 18 Watt	Light bulb	16,670	51.8	0.009	863,918	154.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 23 Watt	Light bulb	505	120.8	0.022	60,995	10.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	Standard LED 40 Watt	Light bulb	3	104.6	0.019	314	0.1	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	LED Seasonal	Light bulb	38	0.0	0.000	-	0.0	No direct savings
	Room Air Purifiers	Air purifier	7	29.6	0.004	207	0.0	NEEP Technical Reference Manual - page 234
	Clothes Washer Tier 1/2	Washer	1,614	202.0	0.028	325,422	45.8	Draft Ohio 2010 Technical Reference Manual - Page 59
	Clothes Washer Tier N/A	Washer	2	0.0	0.000	-	0.0	Draft Ohio 2010 Technical Reference Manual - Page 59
	Clothes Washer Tier 3	Washer	667	233.0	0.032	155,178	21.8	Draft Ohio 2010 Technical Reference Manual - Page 59
	Dehumidifier > 25 to ≤35 Pints/Day	Dehumidifier	194	117.0	0.027	22,347	5.2	Draft Ohio 2010 Technical Reference Manual - Page 64
	Dehumidifier > 54 to ≤ 75 Pints/Day	Dehumidifier	28	213.0	0.048	5,964	1.3	Draft Ohio 2010 Technical Reference Manual - Page 64
	Dehumidifier > 35 to ≤45 Pints/Day	Dehumidifier	489	297.0	0.068	145,233	33.3	Draft Ohio 2010 Technical Reference Manual - Page 64
	Dehumidifier > 45 to ≤ 54 Pints/Day	Dehumidifier	953	185.0	0.042	176,120	40.0	Draft Ohio 2010 Technical Reference Manual - Page 64
	Dehumidifier > 75	Dehumidifier	8	374.0	0.085	2,992	0.7	Draft Ohio 2010 Technical Reference Manual - Page 64
	Refrigerator - Bottom Freezer	Refrigerator	2,099	100.4	0.022	240,630	44.4	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator - Top Freezer	Refrigerator	406	99.5	0.018	40,400	7.3	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator - Side-by-Side	Refrigerator	198	115.8	0.025	27,195	4.9	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator - Freezerless and Single Door	Refrigerator	8	52.3	0.018	318	0.1	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator - N/A	Refrigerator	2	100.0	0.018	200	0.0	Draft Ohio 2010 Technical Reference Manual - Page 53
	Heat Pump Water Heater - Electric Heat	Heat pump	61	499.0	0.068	30,439	4.1	Draft Ohio 2010 Technical Reference Manual - Page 86
	Heat Pump Water Heater - Heat Pump	Heat pump	93	1297.0	0.180	119,324	16.6	Draft Ohio 2010 Technical Reference Manual - Page 86
	Heat Pump Water Heater - Gas Heat	Heat pump	131	2076.0	0.280	271,956	36.7	Draft Ohio 2010 Technical Reference Manual - Page 86

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Efficient Products ¹	Smart Thermostat	Thermostat	4,615	487.7	0.068	2,250,523	314.4	IL - Illinois Technical Reference Manual- - Page 152
	Air Conditioner	Air conditioner	2,060	283.5	0.230	584,076	473.0	Draft Ohio 2010 Technical Reference Manual - Page 30
	Air Source Heat Pump	Heat pump	328	641.1	0.203	210,271	66.5	Draft Ohio 2010 Technical Reference Manual - Page 33
	Ductless Mini-Split	Heat pump	119	1205.9	0.132	143,503	15.7	Draft Ohio 2010 Technical Reference Manual - Page 33
	Ground Source Heat Pump	Heat pump	21	3160.7	0.552	66,374	11.6	Draft Ohio 2010 Technical Reference Manual - Page 82
	Pool Pump	Pool Pump	352	1170.0	1.730	411,840	609.0	Draft Ohio 2010 Technical Reference Manual - Page 118
	Faucet Aerators	Faucet aerator	12,462	16.1	0.002	200,564	25.0	Draft Ohio 2010 Technical Reference Manual - Page 89
	Low Flow Showerheads	Low flow showerhead	6,048	174.8	0.022	1,056,932	135.2	Draft Ohio 2010 Technical Reference Manual - Page 93
	LED Night Light	Night light	19,132	16.0	0.000	306,799	0.0	Based on 2017 Navigant Evaluation Result
	7-Plug Smart Strip	Smart strip	4,303	103.1	0.009	443,497	39.7	Draft Ohio 2010 Technical Reference Manual - Page 76
	TOTAL					110,371,941	20,332.8	
Appliance Recycling	Freezer	Freezer	3,266	1,244.4	0.200	4,064,210	653.2	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator	Refrigerator	15,544	1,376.2	0.220	21,390,876	3,419.7	Draft Ohio 2010 Technical Reference Manual - Page 23
	TOTAL					25,455,086	4,072.9	
Efficiency Crafted New Homes	Energy Star Home	Energy Star home	2,011	3,124.8	1.5	6,283,917	3,010.6	Residential Energy Modeling
New Manufactured Homes	New Manufactured Homes	Manufactured Home	58	6,870.3	2.6	398,478	153.1	Residential Energy Modeling
E3Smart	HW Temp Setback	Temp setback	602	81.6	0.009	49,123	5.4	Standard Engineering Calculation
	Bathroom Faucet Aerator	Faucet aerator	3,259	94.4	0.012	307,638	38.4	Draft Ohio 2010 Technical Reference Manual - Page 89
	Kitchen Faucet Aerator	Faucet aerator	3,123	55.1	0.007	172,210	21.5	Draft Ohio 2010 Technical Reference Manual - Page 89
	Low Flow Showerhead	Low flow showerhead	3,946	280.3	0.036	1,105,906	141.5	Draft Ohio 2010 Technical Reference Manual - Page 93
	11 Watt LED Replacing 13W CFL	Light bulb	794	2.1	0.000	1,669	0.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	11 Watt LED 23 Replacing 23W CFL	Light bulb	605	12.6	0.002	7,630	0.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	11 Watt LED Replacing 40W	Light bulb	949	17.6	0.003	16,696	3.0	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	11 Watt LED Replacing 60W	Light bulb	4,383	31.3	0.006	137,090	24.4	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	11 Watt LED Replacing 75W	Light bulb	2,129	41.1	0.007	87,400	15.6	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	11 Watt LED Replacing 100W	Light bulb	1,827	59.6	0.011	108,932	19.4	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 13W CFL	Light bulb	1,825	4.2	0.001	7,672	0.9	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 23W CFL	Light bulb	1,196	14.7	0.002	17,598	2.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 40W	Light bulb	3,498	19.5	0.003	68,381	12.2	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 60W	Light bulb	12,255	33.2	0.006	407,266	72.6	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 75W	Light bulb	3,274	43.0	0.008	140,805	25.1	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	9 Watt LED Replacing 100W	Light bulb	1,958	61.6	0.011	120,570	21.5	Based on Draft Ohio 2010 Technical Reference Manual - Page 11
	LED Night Light	Light bulb	6,117	20.6	0.000	125,949	-	Based on 2013 Navigant Evaluation Result
	Weather Stripping	Square foot	8,319	11.1	0.001	92,341	6.6	Based on 2013 Navigant Evaluation Result
	Allocated Kits ²	Kit	4,470	68.0	0.009	303,889	42.2	Calculation based on Program Year data
	TOTAL					3,278,765	453.6	
Intelligent Homes	Mobile Application	Participant	23,471	-	0.000	-	-	Proprietary Regression Model
	Energy Bridge	Participant	9,816	-	0.000	-	-	Proprietary Regression Model
	Connected Thermostat	Participant	2,153	358.4	0.662	768,688	1,420.0	Proprietary Regression Model
	TOTAL					768,688	1,420.0	
Behavioral	Behavioral	Participant	531,283	140.0	0.018	89,090,065	11,581.0	Proprietary Regression Model
	Cross Participation Reduction ³	Participant	531,283	0.99	0.0001	(504,103)	(65.5)	Calculation based on Program Participation T-Tests
	TOTAL					88,585,962	11,515.5	

¹Energy and Demand savings for the inactive AEP Ohio customers are zeroed out
²These are kits that have not had returned surveys, so a reduced installation rate was assigned for these units
³Cross Participation savings reduced from the program savings

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Low Income	Retirement of additional freezer	Freezer	1	1,244.0	0.200	1,244	0.20	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 9-15 upright	Freezer	18	882.2	0.135	15,880	2.43	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 16-18 upright	Freezer	114	882.2	0.135	100,571	15.38	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 16-18 upright	Freezer	129	47.0	0.008	6,063	1.06	Energy Star Qualified Product List
	Freezer replacement 19-21 upright	Freezer	26	882.2	0.135	22,937	3.51	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 5-10 Chest	Freezer	69	882.2	0.135	60,872	9.31	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 11-15 Chest	Freezer	74	882.2	0.135	65,283	9.98	Draft Ohio 2010 Technical Reference Manual - Page 23
	Freezer replacement 11-15 Chest	Freezer	14	26.0	0.005	364	0.06	Energy Star Qualified Product List
	Refrigerator replacement 14-16 TF	Refrigerator	203	976.0	0.156	198,128	31.67	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator replacement 14-16 TF	Refrigerator	363	100.0	0.018	36,300	6.53	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 17-19 TF	Refrigerator	552	976.0	0.156	538,752	86.11	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator replacement 17-19 TF	Refrigerator	1,235	100.0	0.018	123,500	22.23	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 20-22 TF	Refrigerator	202	976.0	0.156	197,152	31.51	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator replacement 20-22 TF	Refrigerator	126	100.0	0.018	12,600	2.27	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 19-22 BF	Refrigerator	105	976.0	0.156	102,480	16.38	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator replacement 19-22 BF	Refrigerator	44	119.0	0.021	5,236	0.92	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 20-23 SBS	Refrigerator	53	976.0	0.156	51,728	8.27	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 20-23 SBS	Refrigerator	233	142.0	0.025	33,086	5.83	Draft Ohio 2010 Technical Reference Manual - Page 53
	Refrigerator replacement 24-26 SBS	Refrigerator	190	976.0	0.156	185,440	29.64	Draft Ohio 2010 Technical Reference Manual - Page 23
	Refrigerator replacement 24-26 SBS	Refrigerator	139	142.0	0.025	19,738	3.48	Draft Ohio 2010 Technical Reference Manual - Page 53
	Audits and Metering Fees	Unit	5,333	-	0.000	-	0.00	No direct savings
	Miscellaneous approved items	Unit	(8)	-	0.000	-	0.00	Health and Safety - No savings acquired
	Air Source Heat Pump	Heat pump	24	626.5	0.129	15,036	3.09	Draft Ohio 2010 Technical Reference Manual - Page 33
	DHW Temp Setback	Temp setback	17	146.0	0.000	2,482	0.00	Based on 2012 Navigant Evaluation Result
	HVAC Tune Up	Unit	7	73.7	0.000	516	0.00	Draft Ohio 2010 Technical Reference Manual - Page 26
	HW Tank Wrap	Unit	47	77.3	0.009	3,634	0.41	Draft Ohio 2010 Technical Reference Manual - Page 131
	Install bathroom vent fan (Energy Star)	Fan	71	44.3	0.010	3,145	0.72	NEEP TRM - Page 161
	Faucet Aerator	Faucet aerator	831	24.5	0.003	20,335	2.54	Draft Ohio 2010 Technical Reference Manual - Page 89
	Low flow showerhead	Low flow showerhead	598	52.6	0.006	31,440	3.59	Draft Ohio 2010 Technical Reference Manual - Page 93
	Replace electric water heater	Water heater	29	411.7	0.023	11,940	0.67	http://energy.gov/eere/buildings/residential-buildings-integration
	Remove Space Heater	Space heater	3	1,435.4	0.000	4,306	0.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 33
	Replace wall switch (single pole)	Wall switch	4	-	0.000	-	0.00	No direct savings
	Smart Strips	Smart strip	3,668	81.9	0.000	300,448	0.00	Draft Ohio 2010 Technical Reference Manual - Page 76
	LED (60 w replacement) indoor	Light bulb	30,348	33.2	0.006	1,008,111	179.67	Based on Draft Ohio 2010 Technical Reference Manual - Page 12
	LED (100 w replacement) indoor	Light bulb	5,827	54.7	0.010	318,893	56.83	Based on Draft Ohio 2010 Technical Reference Manual - Page 13
	LED (40 w candelabra replacement) indoor	Light bulb	7,587	34.2	0.006	259,552	46.26	Based on Draft Ohio 2010 Technical Reference Manual - Page 14
	LED (40 w globe replacement) indoor	Light bulb	2,588	34.2	0.006	88,399	15.76	Based on Draft Ohio 2010 Technical Reference Manual - Page 15
	LED (60 w replacement) outdoor	Light bulb	362	33.2	0.000	12,030	0.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 16
	LED (75 w floodlight replacement) outdoor	Light bulb	951	60.6	0.000	57,631	0.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 17
	LED (75 w replacement) indoor	Light bulb	2,928	39.1	0.007	114,398	20.39	Based on Draft Ohio 2010 Technical Reference Manual - Page 18
	LED (3-way replacement)indoor	Light bulb	1,574	82.0	0.015	129,068	23.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 19
	Closable Foundation Vents	Unit	25	-	0.000	-	0.00	No direct savings
	Install 12x12 gable vent	Unit	9	-	0.000	-	0.00	No direct savings
	Install 12x18 gable vent	Unit	11	-	0.000	-	0.00	No direct savings
	Install 12` roof vent (average)	Unit	57	-	0.000	-	0.00	No direct savings
	Install 12` roof vent (difficult)	Unit	15	-	0.000	-	0.00	No direct savings
	Install 8` or 9` roof vent	Unit	15	-	0.000	-	0.00	No direct savings
	Duct Sealing per CFM reduction - Heat Pump	CFM reduced	295	2.5	0.000	735	0.14	Draft Ohio 2010 Technical Reference Manual - Page 108
	Duct Sealing per CFM reduction - Electric Heat No AC	CFM reduced	220	3.8	0.000	832	0.10	Draft Ohio 2010 Technical Reference Manual - Page 108
	Duct Sealing per CFM reduction - Electric Heat w/AC	CFM reduced	682	3.8	0.000	2,578	0.32	Draft Ohio 2010 Technical Reference Manual - Page 108
	Duct Insulation R-7 per sq ft	Square footage installed	838	3.1	0.000	2,584	0.29	Draft Ohio 2010 Technical Reference Manual - Page 108
	Shell Air Sealing per CFM reduction - Heat Pump	CFM reduced	2,560	1.8	0.000	4,487	0.28	Draft Ohio 2010 Technical Reference Manual - Page 104
	Shell Air Sealing per CFM reduction - Electric Heat No AC	CFM reduced	10,947	1.6	0.000	17,512	0.89	Draft Ohio 2010 Technical Reference Manual - Page 104
	Shell Air Sealing per CFM reduction - Electric Heat w/AC	CFM reduced	7,157	1.9	0.000	13,385	0.78	Draft Ohio 2010 Technical Reference Manual - Page 104

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Low Income	Attic Insulation (R-11 -> R-38) - Central Air Conditioning	Square footage installed	21,201	0.0	0.000	598	0.54	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-11 -> R-38) - Heat Pump	Square footage installed	3,847	1.2	0.000	4,554	0.10	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-11 -> R-38) - Electric Heat No AC	Square footage installed	1,888	1.9	0.000	3,570	0.05	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-11 -> R-38) - Electric Heat w/AC	Square footage installed	6,993	1.8	0.000	12,556	0.18	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-19 -> R-38) - Central Air Conditioning	Square footage installed	23,281	0.0	0.000	262	0.24	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-19 -> R-38) - Heat Pump	Square footage installed	960	0.5	0.000	463	0.01	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-19 -> R-38) - Electric Heat No AC	Square footage installed	2,026	0.8	0.000	1,561	0.02	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-19 -> R-38) - Electric Heat w/AC	Square footage installed	6,966	0.7	0.000	4,914	0.07	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-28 -> R-38) - Central Air Conditioning	Square footage installed	1,430	-	0.000	6	0.01	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-28 -> R-38) - Heat Pump	Square footage installed	2,240	0.2	0.000	386	0.01	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-5 -> R-38) - Central Air Conditioning	Square footage installed	15,590	0.1	0.000	1,182	1.07	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R-5 -> R-38) - Electric Heat w/AC	Square footage installed	3,058	5.1	0.000	15,550	0.21	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R44) - Central Air Conditioning	Square footage installed	292	0.1	0.000	23	0.02	Draft Ohio 2010 Technical Reference Manual - Page 36
	Attic Insulation (R44) - Heat Pump	Square footage installed	3,311	5.1	0.000	17,014	0.23	Draft Ohio 2010 Technical Reference Manual - Page 36
	Install floor insulation (crawlspace) - Central Air Conditioning	Square footage installed	786	0.1	0.000	47	0.04	Based on Draft Ohio 2010 Technical Reference Manual - Page 36
	Install floor insulation (crawlspace) - Heat Pump	Square footage installed	2,025	2.5	0.000	5,103	0.01	Based on Draft Ohio 2010 Technical Reference Manual - Page 36
	Install floor insulation (crawlspace)-Electric Heat No AC	Square footage installed	800	4.0	0.000	3,221	0.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 36
	Install floor insulation (crawlspace)-Electric Heat w/AC	Square footage installed	388	4.0	0.000	1,562	0.00	Based on Draft Ohio 2010 Technical Reference Manual - Page 36
	Mobile Home Belly Patch	Unit	11,994	-	0.000	-	0.00	No direct savings
	Mobile Home Roof Coat	Unit	2,624	-	0.000	-	0.00	No direct savings
	Mobile Home Underneath Vapor Retarder	Unit	31,100	-	0.000	-	0.00	No direct savings
	R15 Mobile Home blown FG 4` - Central Air Conditioning	Square footage installed	(740)	0.1	0.000	(43)	(0.04)	Draft Ohio 2010 Technical Reference Manual - Page 126
	R15 Mobile Home blown FG 4` - Heat Pump	Square footage installed	980	2.4	0.000	2,395	0.05	Draft Ohio 2010 Technical Reference Manual - Page 126
	R15 Mobile Home blown FG 4` - Electric Heat No AC	Square footage installed	1,444	3.9	0.000	5,637	0.08	Draft Ohio 2010 Technical Reference Manual - Page 126
	R15 Mobile Home blown FG 4` - Electric Heat w/AC	Square footage installed	3,140	3.9	0.000	12,258	0.17	Draft Ohio 2010 Technical Reference Manual - Page 126
	R23 Mobile Home blown FG 6` - Central Air Conditioning	Square footage installed	(1,809)	0.1	0.000	(124)	(0.11)	Draft Ohio 2010 Technical Reference Manual - Page 126
	R23 Mobile Home blown FG 6` - Heat Pump	Square footage installed	2,688	4.1	0.000	11,025	0.17	Draft Ohio 2010 Technical Reference Manual - Page 126
	R23 Mobile Home blown FG 6` - Electric Heat No AC	Square footage installed	5,887	4.6	0.000	26,810	0.21	Draft Ohio 2010 Technical Reference Manual - Page 126
	R23 Mobile Home blown FG 6` - Electric Heat w/AC	Square footage installed	6,900	4.6	0.000	31,620	0.43	Draft Ohio 2010 Technical Reference Manual - Page 126
	R30 Mobile home blown FG 8` - Heat Pump	Square footage installed	5,526	3.5	0.000	19,544	0.36	Draft Ohio 2010 Technical Reference Manual - Page 126
	R30 Mobile home blown FG 8` - Electric Heat No AC	Square footage installed	3,113	4.9	0.000	15,138	0.16	Draft Ohio 2010 Technical Reference Manual - Page 126
	R30 Mobile home blown FG 8` - Electric Heat w/AC	Square footage installed	2,955	4.9	0.000	14,419	0.20	Draft Ohio 2010 Technical Reference Manual - Page 126
	R38 Mobile Home blown FG 12` - Heat Pump	Square footage installed	495	8.2	0.000	4,055	0.03	Draft Ohio 2010 Technical Reference Manual - Page 126
	R38 Mobile Home blown FG 12` - Electric Heat No AC	Square footage installed	1,554	5.0	0.000	7,784	0.00	Draft Ohio 2010 Technical Reference Manual - Page 126
	R38 Mobile Home blown FG 12` - Electric Heat w /AC	Square footage installed	655	5.1	0.000	3,331	0.05	Draft Ohio 2010 Technical Reference Manual - Page 126
	R45 Mobile home blown FG 12` - Heat Pump	Square footage installed	650	3.3	0.000	2,118	0.05	Draft Ohio 2010 Technical Reference Manual - Page 126
	R45 Mobile home blown FG 12` - Electric Heat w/AC	Square footage installed	3,416	5.2	0.000	17,780	0.24	Draft Ohio 2010 Technical Reference Manual - Page 126
	Wall insulation- Framed siding(target R11) - Central Air Conditioning	Square footage installed	21,433	0.1	0.000	1,287	1.17	Draft Ohio 2010 Technical Reference Manual - Page 100
	Wall insulation- Framed siding(target R11) - Heat Pump	Square footage installed	408	2.5	0.000	1,028	0.02	Draft Ohio 2010 Technical Reference Manual - Page 100
	Wall insulation- Framed siding(target R11) - Electric Heat w/AC	Square footage installed	1,526	4.0	0.000	6,143	0.08	Draft Ohio 2010 Technical Reference Manual - Page 100
	Wall insulation- Brick Veneer(target R11) - Heat Pump	Square footage installed	1,444	0.1	0.000	87	0.08	Draft Ohio 2010 Technical Reference Manual - Page 100
	Water Pipe Insulation	Square footage installed	654	160.2	0.018	104,786	11.96	Draft Ohio 2010 Technical Reference Manual - Page 97
	TOTAL					4,560,483	660.7	

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Process Efficiency	Replacing (2) 1000 HP compressor with a 600 HP VFD driven compressor. No change to the existing (1) 500 HP Compressor	Custom Measure	1	1,336,238.9	186.770	1,336,238.9	186.8	All Custom Measures are individually calculated using methodology consistent with the Draft Ohio 2010 Technical Reference Manual.
	The existing system consists of three (3) KAESER BSD 50 (50 HP) fixed speed dual control compressors of various generations. One of the compressor has an integrated refrigerated dryer, while the other two feed through a KAESER TE 142 cycling refrigerated dryer. The system has storage of 1020 gallons in the compressor room. - Replace with: In addition to the above equipment, the proposed system consists of KAESER SAM 4.0 master controller to effectively and efficiently coordinate the operation of compressed air system. SAM 4.0's unique 3D Advanced control algorithm not only operates only the right compressors for given air demand but also adjusts system setpoint pressure in real-time to optimize the correct pressure settings for a given system demand. This in addition to reduction in overall system pressure resulted in system specific power of 19.51 kW/100 CFM. That is 8.6% efficient compared to the system without SAM 4.0 controller.	Custom Measure	1	44,095.0	15.150	44,095.0	15.2	
	Compressed air system retrofit installing 150-hp VFD compressor & removing two of 100-hp constant speed compressors	Custom Measure	1	159,349.0	57.290	159,349.0	57.3	
	Could have installed 250 HP rotary screw air compressor. To Installed 250 HP VFD air compress	Custom Measure	1	249,808.0	32.830	249,808.0	32.8	
	Install digital automation to control compressors	Custom Measure	1	852,642.0	141.620	852,642.0	141.6	
	Replace 3 compressors, 20 HP each with one compressor 75 HP	Custom Measure	1	66,684.0	-	66,684.0	-	
	Replacing existing compressor with new compressors and adding central management system	Custom Measure	1	524,886.0	87.660	524,886.0	87.7	
	1. A new 125 HP Ingersoll Rand Variable Speed, 2 stage compressor will provide approximately 10% more air capacity and will use less energy than the existing 125 HP, single speed compressor. 2. A new 1,000 cfm air dryer will replace the existing, unreliable 700 cfm air dryer. The increased dryer capacity will help ensure that we provide moisture free compressed air to the plant even during high humidity weather conditions. 3. A 2,000 gallon air receiver will be installed to replace the existing 600 gallon air receiver.	Custom Measure	1	298,070.0	-	298,070.0	-	
	Centralized Energy Management Control System	Custom Measure	1	44,376.0	-	44,376.0	-	
	Retrofit uncontrolled 169W heat mats with controllers that lower the temperature and power consumption of heat mats as piglets getolder (60 mats total)	Custom Measure	1	32,362.0	4.590	32,362.0	4.6	
	Retrofit uncontrolled 169W heat mats with controllers that lower the temperature and power consumption of heat mats as piglets getolder (96 mats total)	Custom Measure	1	51,780.0	7.340	51,780.0	7.3	All Custom Measures are individually calculated using methodology consistent with the Draft Ohio 2010 Technical Reference Manual.
	Occupancy sensors were installed and integrated with existing HVAC equipment to set air handlers back when unoccupied.	Custom Measure	1	208,685.0	30.350	208,685.0	30.4	
	Upgrading existing inoperable DDC controls with new DDC control system	Custom Measure	1	187,033.2	9.861	187,033.2	9.9	
	HVAC Optimization: Reduce Building Stack Effect	Custom Measure	1	695,188.0	185.590	695,188.0	185.6	
	Replace 2nd generation LED with 6th generation LED	Custom Measure	1	24,895.5	2.430	24,895.5	2.4	
	Replace a 40hp constant speed exhaust fan with a 15hp vfd exhaust fan, reduce existing supply air volume, reduce chiller load.	Custom Measure	1	389,269.0	27.360	389,269.0	27.4	
	Installed a 60% energy savings press over a traditional convensional hydraulic press. The Servo motor system is able to regenerate power under deceleration. This equipment is already installed at the facility. There is an oprotunity to monitor the old equiptment from an existing press similar in production and usage. They actually installed 2 newer presses, one this year, and one last year. Pres.0201 is new this year Pres.0202 was installed last year Pres.0203 is the hydraulic press that can be montioered for calculations	Custom Measure	1	43,770.0	18.690	43,770.0	18.7	
	Replaced a mechanical stamping press with a servo motor stamping press	Custom Measure	1	42,763.5	9.500	42,763.5	9.5	
	Existing equipment was cooling pre-blend fluid with the cooling tower loop. This was replaced with a 209B heat X in parrallel with 209A which allows for pre-blend cooling load to be removed from exisiting cooling tower loop.	Custom Measure	1	1,286,133.0	146.820	1,286,133.0	146.8	
	Cooling tower water was used to cool down the pre-blend fluid that bypassed 209A heat exchanger. This put a large heating load on the cooling tower. Replaced with: 209B heat exchanger was put in parrallel with 209A to allow all pre-blend to be cooled using the beer line rather than cooling tower water. Thus pulling load off cooling tower.	Custom Measure	1	708,669.6	80.900	708,669.6	80.9	
	Replaced old immersion water bath system with ARS system	Custom Measure	1	278,276.7	-	278,276.7	-	All Custom Measures are individually calculated using methodology consistent with the Draft Ohio 2010 Technical Reference Manual.
	LED Refrigerated Case Lighting (LED to LED) Older generation to new generation with higher e	Custom Measure	1	49,246.0	7.940	49,246.0	7.9	
	LED Refrigerated Case Lighting - older generation model to new more efficient generation)	Custom Measure	1	27,342.6	4.410	27,342.6	4.4	
	LED Refrigerated Case Lighting (LED to more efficient LED)	Custom Measure	2	21,120.3	3.400	42,240.6	6.8	
	LED Refrigerated Case Lighting (Old LED to new LED)	Custom Measure	1	15,528.0	2.500	15,528.0	2.5	
	LED Refrigerated case lighting (replace old LEDs with more efficient LED)	Custom Measure	1	12,413.5	2.000	12,413.5	2.0	
	LED refrigerated case lighting. Older generation LED to newer more efficient LED	Custom Measure	1	25,865.2	4.170	25,865.2	4.2	
	LED Refrigerated case upgrade. LED to LED, (lumens per watt improvement)	Custom Measure	1	8,203.2	1.320	8,203.2	1.3	
	Newer generation LED refrigerated case lighting replacing older generation refrigerated case ligh	Custom Measure	1	15,266.3	2.460	15,266.3	2.5	
	Newer generation refrigerated case LED lighting replacing older generation LED lighting	Custom Measure	1	46,632.8	7.520	46,632.8	7.5	
	Replace older generation refrigerated case LED lighting with newer generation LED lighting	Custom Measure	1	777.5	0.120	777.5	0.1	
	replace older refrigerated case LED lighting with newer generation refrigerated case LED lighting	Custom Measure	1	24,640.7	3.970	24,640.7	4.0	
	Replacing existing LED Refrigeration Door Strip Lighting with new, more energy efficient LED's.	Custom Measure	1	35,741.1	5.760	35,741.1	5.8	

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
	Replacing existing Refrigeratiion LED lighting with more energy efficient Refrigeration LED	Custom Measure	1	23,487.0	3.790	23,487.0	3.8	
	Replacing Existing refrigeration LED's with More Energy Efficienct LED's	Custom Measure	2	36,543.0	5.890	73,086.0	11.8	
	Cycling Air Dryer	SCFM	800	12.8	-	10,248.0	-	Vendor Internal TRM - Compressed Air
	Compressed Air Leak Repair	CFM	84	600.0	0.170	50,400.0	14.3	Vendor Internal TRM - Compressed Air
	No Loss Condensate Drain	Drain	2	1,913.6	0.265	3,827.2	0.5	Vendor Internal TRM - Compressed Air
	LED Refrigeration Case Lighting - With Doors	Unit	502	413.3	0.067	207,270.0	33.4	Vendor Internal TRM - Refrigeration
	TOTAL					8,197,190	1,157.5	
New Construction	Controlled heat lamps that decrease temperature & energy use	Custom measure	1	17,486.0	0.000	17,486.0	0.0	
	2 30hp Ground Source Heat Pumps (30 tons)	Custom measure	1	32,171.7	25.419	32,171.7	25.4	
	3 Energy Recovery Ventilators	Custom measure	1	11,312.0	0.000	11,312.0	0.0	
	New RTU installed in fitness center with Heat Recovery Wheel.	Custom measure	1	25,052.0	21.983	25,052.0	22.0	
	LED Theater lighting (interior)	Custom measure	1	192,501.1	48.164	192,501.1	48.2	
	VFD Aeration Blowers, Influent VFD Pumps, VFD ATAD Blowers and Pumps.	Custom measure	1	863,739.8	85.710	863,739.8	85.7	
	Expert Variable flow refrigeration system	Custom measure	1	441,528.0	56.880	441,528.0	56.9	
	Insulated concrete form (ICF) wall construction	Custom measure	1	52,418.7	0.626	52,418.7	0.6	
	Water Pre-Heat Heat Exchanger	Custom measure	1	20,383.6	2.324	20,383.6	2.3	
	HVAC optimization	Custom measure	1	762.4	0.157	762.4	0.2	
	Prescriptive Whole Building	Unit	99,729	2.7	0.000	268,613.0	45.0	Implementer Prescriptive Model
	Whole building - >30% (Owner)	Project	8	734,205.6	105.475	5,873,645.0	843.8	Individually modeled by Implementer
	Whole building - e10 and <20% (Owner)	Project	3	390,297.0	126.567	1,170,891.0	379.7	Individually modeled by Implementer
	Whole building - e20 and <30% (Owner)	Project	6	362,852.1	85.067	2,177,112.7	510.4	Individually modeled by Implementer
	Cycling Air Dryer	Unit	2	5,150.9	0.588	10,301.8	1.2	Vendor Internal TRM - Compressed Air
	No Loss Condensate Drain	Unit	3	2,368.2	0.305	7,104.7	0.9	Vendor Internal TRM - Compressed Air
	Air Compressor Motor	Unit	2	170,018.7	10.120	340,037.5	20.2	Vendor Internal TRM - Compressed Air
	Low Pressure Drop Filter	Unit	3	8,561.4	1.270	25,684.2	3.8	Vendor Internal TRM - Compressed Air
	Air Cooled, electrically operated chiller: <150 tons	Unit	3	4,522.0	6.834	13,565.9	20.5	Vendor Internal TRM - Cooling
	Air Cooled, electrically operated chiller: >=150 tons	Unit	1	25,850.1	54.594	25,850.1	54.6	Vendor Internal TRM - Cooling
	Water cooled, centrifugal chiller: 300 to 599 Tons	Ton	3	18,076.3	20.095	54,228.9	60.3	Vendor Internal TRM - Cooling
	Water cooled, centrifugal chiller: >= 600 Tons	Ton	2	41,300.7	99.400	82,601.5	198.8	Vendor Internal TRM - Cooling
	Air Source Heat Pump < 5.4 tons	Unit	2	1,111.4	0.460	2,222.8	0.9	Vendor Internal TRM - Cooling
	Air-Side Economizer on RTU AHU DX or UV	Unit	21	238.1	0.000	5,001.1	0.0	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC - 11.25 - 19.9 tons	Unit	2	872.3	0.308	1,744.5	0.6	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC - 5.4 - 11.24 tons	Unit	4	1,029.4	0.645	4,117.5	2.6	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow - < 5.4 tons	Unit	33	142.8	0.057	4,712.2	1.9	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC	Unit	1	11,088.7	0.535	11,088.7	0.5	Vendor Internal TRM - Cooling
	Cental Air Conditioner - 11.25 -19.9 tons	Unit	11	2,452.3	0.430	26,974.8	4.7	Vendor Internal TRM - Cooling
	Cental Air Conditioner - 20 -63.2 tons	Unit	20	6,631.2	1.914	132,624.1	38.3	Vendor Internal TRM - Cooling
	Cental Air Conditioner - 5.4 -11.24 tons	Unit	32	1,228.0	0.389	39,295.5	12.4	Vendor Internal TRM - Cooling
	Cental Air Conditioner - < 5.4 tons	Unit	80	390.4	0.221	31,229.9	17.6	Vendor Internal TRM - Cooling
	Cental Air Conditioner - > 63.3 tons	Unit	12	24,496.7	4.190	293,960.9	50.3	Vendor Internal TRM - Cooling
	Hotel Guest Room Occupancy Sensor (Electric Heat)	Room controlled	119	1,117.0	0.159	132,923.0	18.9	Vendor Internal TRM - Cooling
	Toilet Room Exhaust Occ Sensor	Fan	4	71.0	0.003	283.9	0.0	Vendor Internal TRM - Cooling
	PTAC/PTHP	Ton	551	101.2	0.044	55,758.3	24.5	Vendor Internal TRM - Cooling
	Room AC < 2 tons	Ton	3	193.9	0.188	581.8	0.6	Vendor Internal TRM - Cooling
	Ground-source Heat Pump	Ton	6	1,683.1	0.497	10,098.7	3.0	Vendor Internal TRM - Cooling
	Ice Maker >1001 lbs/day	Icemaker	8	1,195.0	0.130	9,560.0	1.0	Vendor Internal TRM - Food Service
	Ice Maker 101-400 lbs/day	Icemaker	1	581.0	0.109	581.0	0.1	Vendor Internal TRM - Food Service
	Ice Maker 401-1000 lbs/day	Icemaker	20	1,005.7	0.137	20,114.0	2.7	Vendor Internal TRM - Food Service
	Hot Holding Cabinet	Cabinet	5	3,155.2	0.330	15,776.0	1.6	Vendor Internal TRM - Food Service
	Combination Oven	Unit	1	6,368.0	0.590	6,368.0	0.6	Vendor Internal TRM - Food Service
	DCV for Kitchen Exhaust Hood	Horse power	9	15,930.3	2.699	143,372.6	24.3	Vendor Internal TRM - Food Service
	Exterior New Construction - Lighting Power Density	Watt reduced	571,647	4.5	0.000	2,592,948.0	0.0	Vendor Internal TRM - Lighting
	Interior Daylighting Controls	Unit	21	1,841.6	0.940	38,674.0	19.7	Vendor Internal TRM - Lighting
	Interior New Construction - Lighting Power Density	Watt reduced	2,707,216	4.9	0.001	13,400,345.0	2,335.0	Vendor Internal TRM - Lighting
	Interior Occupancy Sensor	Watt controlled	122,484	2.0	0.000	243,948.0	52.0	Vendor Internal TRM - Lighting
	Occupancy sensors, 45% LPD reduction	Watt controlled	36,662	1.3	0.000	48,408.5	7.3	Vendor Internal TRM - Lighting
	Engine Block Heater Timer	Timer	4	663.6	0.000	2,654.5	0.0	Vendor Internal TRM - Agriculture
	Livestock Waterers	Unit	8	629.6	0.000	5,036.8	0.0	Vendor Internal TRM - Agriculture
	High Speed Fans 24" to 35"	Fan	9	14,241.7	2.835	128,175.5	25.5	Vendor Internal TRM - Agriculture
	High Speed Fans 36" to 47"	Fan	2	625.0	0.198	1,250.0	0.4	Vendor Internal TRM - Agriculture
	High Speed Fans 48" to 71"	Fan	124	1,122.0	0.356	139,128.0	44.1	Vendor Internal TRM - Agriculture
	Scroll Compressors for Dairy Refrigeration With Plate Heat Exchanger	Pounds of milk/day	1	8,228.1	1.152	8,228.1	1.2	Vendor Internal TRM - Agriculture
	VSD's for Agricultural Pumps	Unit	2	7,999.1	0.950	15,998.2	1.9	Vendor Internal TRM - Agriculture

All Custom Measures are individually calculated using methodology consistent with the Draft Ohio 2010 Technical Reference Manual.

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
New Construction	ECM for HVAC - Heating Only	Motor	13	282.9	0.234	3,677.4	3.0	Vendor Internal TRM - Motors and Drives
	Chilled Water Pump	Unit	9	6,079.3	1.565	54,714.0	14.1	Vendor Internal TRM - Motors and Drives
	Cooling Tower Fan	Unit	24	1,406.3	0.348	33,750.0	8.4	Vendor Internal TRM - Motors and Drives
	Hot Water Pump	Unit	14	4,451.6	0.018	62,323.0	0.2	Vendor Internal TRM - Motors and Drives
	Other HVAC Motor	Unit	30	5,155.2	0.543	154,654.8	16.3	Vendor Internal TRM - Motors and Drives
	Other Non-HVAC Motor	Unit	41	34,370.3	3.632	1,409,184.1	148.9	Vendor Internal TRM - Motors and Drives
	Supply/Return Fan	Unit	24	6,987.2	1.052	167,692.0	25.3	Vendor Internal TRM - Motors and Drives
	300 kVA Three Phase Dry Type Low Voltage Transformers	Transformer	1	4,673.4	0.650	4,673.4	0.6	Vendor Internal TRM - Miscellaneous
	112.5 kVA Three Phase Dry Type Low Voltage Transformers	Transformer	4	1,729.1	0.425	6,916.4	1.7	Vendor Internal TRM - Miscellaneous
	75 kVA Three Phase Dry Type Low Voltage Transformers	Transformer	8	1,396.2	0.343	11,169.5	2.7	Vendor Internal TRM - Miscellaneous
	45 kVA Three Phase Dry Type Low Voltage Transformers	Transformer	7	1,024.9	0.252	7,174	1.8	Vendor Internal TRM - Miscellaneous
	30 kVA Three Phase Dry Type Low Voltage Transformers	Transformer	6	996.2	0.245	5,977	1.5	Vendor Internal TRM - Miscellaneous
	NEMA Premium transformer efficiency - My Solutions Application	Square Footage	60,759	0.1	0.000	4,636	0.6	Vendor Internal TRM - Miscellaneous
	ENERGY STAR Glass Door Freezer	Freezer	25	2,556.2	0.292	63,904	7.3	Vendor Internal TRM - Refrigeration
	ENERGY STAR Glass Door Refrigerator	Refrigerator	88	603.6	0.066	53,119	5.8	Vendor Internal TRM - Refrigeration
	ENERGY STAR Solid Door Freezer	Freezer	30	1,837.9	0.193	55,137	5.8	Vendor Internal TRM - Refrigeration
	ENERGY STAR Solid Door Refrigerator	Refrigerator	9	339.9	0.037	3,059	0.3	Vendor Internal TRM - Refrigeration
	LED Refrigeration Case Lighting - Open Cases	Unit	76	103.7	0.015	7,833	1.2	Vendor Internal TRM - Refrigeration
	LED Refrigeration Case Lighting - With Doors	Unit	277	226.5	0.036	62,734	10.0	Vendor Internal TRM - Refrigeration
	High-performance windows	Square Footage	97,421	0.2	0.000	18,354	3.9	My Solutions Application
	Above code Roof & Wall Insulation with Air Barrier	Square Footage	60,759	0.1	0.000	4,587	1.2	My Solutions Application
	TOTAL					31,475,445	5,335.6	
Efficient Products for Business	Advanced Lighting Controls: High Lumen Low Density	Watt reduced	1,204,805	6.4	0.001	7,659,063.1	837.7	Individually Modeled by Implementer
	Livestock Waterers	Unit	2	1,593.0	0.000	3,186.0	0.0	Vendor Internal TRM - Agriculture
	High Speed Fans 48" to 71"	Fan	20	1,122.0	0.360	22,440.0	7.2	Vendor Internal TRM - Agriculture
	High Volume Low Speed (HVLS) Fans 18'	Fan	2	4,938.0	1.800	9,876.0	3.6	Vendor Internal TRM - Agriculture
	High Volume Low Speed (HVLS) Fans 24'	Fan	4	10,018.0	3.700	40,072.0	14.8	Vendor Internal TRM - Agriculture
	VSD on Dairy Transfer Pump	100 gallons milk/day	16	142.4	0.013	2,207.2	0.2	Vendor Internal TRM - Agriculture
	VSD on Dairy Vacuum Pump	Horsepower	45	2,409.0	0.440	108,405.0	19.8	Vendor Internal TRM - Agriculture
	Milk Pre-Cooler Heat Exchanger (Chiller Savings)	Pounds of milk per day	12,960	1.4	0.000	17,742.2	5.5	Vendor Internal TRM - Agriculture
	Water Pre-Heat Heat Exchanger (Water Heating Savings)	Pounds of milk per day	30,000	2.0	0.001	59,640.0	18.4	Vendor Internal TRM - Agriculture
	Fan Thermostat Controller	HP	1	1,586.0	0.000	1,586.0	0.0	Vendor Internal TRM - Agriculture
	Cycling Air Dryer	SCFM	2,476	12.8	0.000	31,717.6	0.0	Vendor Internal TRM - Compressed Air
	Compressed Air Added Storage	Gallon	1,550	44.9	0.007	69,595.0	10.9	Vendor Internal TRM - Compressed Air
	Low Pressure Drop Filter	SCFM	2,100	25.0	0.003	52,416.0	7.3	Vendor Internal TRM - Compressed Air
	New VFD Compressor	Horsepower	1,220	1,732.3	0.240	2,113,406.0	293.0	Vendor Internal TRM - Compressed Air
	No Loss Condensate Drain	Drain	1	1,913.6	0.265	1,913.6	0.3	Vendor Internal TRM - Compressed Air
	Air Cooled Chiller <150 Tons	Unit	10	11,009.1	5.774	110,091.4	57.7	Vendor Internal TRM - Cooling
	Air Cooled Chiller >= 150 Tons	Unit	8	58,105.9	29.347	464,847.2	234.8	Vendor Internal TRM - Cooling
	Air Source Heat Pump < 5.4 tons	Unit	70	519.5	0.329	36,363.2	23.0	Vendor Internal TRM - Cooling
	Air Source Heat Pump - >= 63.3 tons	Unit	3	14,606.9	11.612	43,820.6	34.8	Vendor Internal TRM - Cooling
	Air Source Heat Pump - 11.25 - 19.9 tons	Unit	77	2,535.7	1.540	195,252.6	118.6	Vendor Internal TRM - Cooling
	Air Source Heat Pump - 20 - 63.2 tons	Unit	37	5,013.8	3.367	185,509.4	124.6	Vendor Internal TRM - Cooling
	Air Source Heat Pump - 5.4 - 11.24 tons	Unit	92	1,119.5	0.731	102,998.5	67.3	Vendor Internal TRM - Cooling
	Air-Side Economizer on RTU AHU DX or UV	Unit	1	26,215.8	0.000	26,215.8	0.0	Vendor Internal TRM - Cooling
	Centralized Energy Management System Controls (Elec Heat)	Square foot of conditioned	243,394	1.3	0.000	320,359.9	0.0	Vendor Internal TRM - Cooling
	Centralized Energy Management System Controls (Non Elec Heat)	Square foot of conditioned	1,552,590	1.3	0.000	1,984,204.3	0.0	Vendor Internal TRM - Cooling
	ECMs for HVAC - Heating and Cooling	Motor	29	656.0	0.462	19,024.0	13.4	Vendor Internal TRM - Cooling
	Occupancy Sensor Control for HVAC Systems	Unit	1	9,151.2	0.000	9,151.2	0.0	Vendor Internal TRM - Cooling
	PTAC	Unit	540	125.1	0.071	67,549.3	38.5	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow Heat Pumps 11.25-19.9 tons	Ton	1	31,447.6	3.997	31,447.6	4.0	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow Heat Pumps < 5.4 tons	Ton	1	3,362.6	0.034	3,362.6	0.0	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC 11.25 - 19.9 tons	Ton	4	3,236.3	1.995	12,945.1	8.0	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC 5.4 - 11.24 tons	Ton	2	1,554.8	1.065	3,109.5	2.1	Vendor Internal TRM - Cooling
	Variable Refrigerant Flow AC < 5.4 tons	Ton	3	379.9	0.457	1,139.6	1.4	Vendor Internal TRM - Cooling
	Water cooled, electrically operated, centrifugal chiller - >= 600 Tons	Unit	2	119,677.1	51.769	239,354.1	103.5	Vendor Internal TRM - Cooling
	Water cooled, electrically operated, centrifugal chiller - 300 to 599 Tons	Unit	1	135,128.3	63.579	135,128.3	63.6	Vendor Internal TRM - Cooling
	Water cooled, electrically operated, centrifugal chiller - < 300 Tons	Unit	3	37,666.6	18.109	112,999.7	54.3	Vendor Internal TRM - Cooling
	Window Film	Square foot	60,665	2.7	0.001	164,402.2	72.8	Vendor Internal TRM - Cooling
	Demand Control Ventilation for Office	Square foot	45,314	0.5	0.000	23,184.9	0.0	Vendor Internal TRM - Cooling
	Variable-Speed Drives for HVAC Chillers	Units	1	91,876.2	70.242	91,876.2	70.2	Vendor Internal TRM - Cooling
	Beverage Machine Controls	Machine	13	1,613.0	0.000	20,969.0	0.0	Vendor Internal TRM - Miscellaneous

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Efficient Products for Business	Combination Oven	Oven	4	11,502.0	1.059	46,008.0	4.2	Vendor Internal TRM - Food Service
	DCV for Kitchen Exhaust Hood - Retrofit	Unit	6	4,486.0	0.760	26,916.0	4.6	Vendor Internal TRM - Food Service
	Ice Maker >1001 lbs/day	Icemaker	2	1,114.0	0.209	2,228.0	0.4	Vendor Internal TRM - Food Service
	Ice Maker 401-1000 lbs/day	Icemaker	3	847.0	0.159	2,541.0	0.5	Vendor Internal TRM - Food Service
	Ice Maker 101-400 lbs/day	Icemaker	3	581.0	0.109	1,743.0	0.3	Vendor Internal TRM - Food Service
	Steam Cookers	Cooker	1	25,545.0	3.526	25,545.0	3.5	Vendor Internal TRM - Food Service
	Snack Machine Controls	Machine	2	387.0	0.000	774.0	0.0	Vendor Internal TRM - Miscellaneous
	Exterior Bi-Level Lighting Controls	Watts controlled	11,390	0.6	0.000	7,109.3	0.0	Vendor Internal TRM - Lighting
	Exterior ES or DLC LED	Unit	14,565	1,121.4	0.000	16,333,197.9	0.4	Vendor Internal TRM - Lighting
	Exterior Exit Sign	Sign	3	78.8	0.009	236.5	0.0	Vendor Internal TRM - Lighting
	Exterior Other LED	Unit	2,874	720.9	0.000	2,071,759.1	0.0	Vendor Internal TRM - Lighting
	Exterior Photocells	Watt controlled	73,469	0.3	0.000	24,150.8	0.0	Vendor Internal TRM - Lighting
	Exterior Screw-in LED	Unit / lamp	2,459	145.8	0.017	358,410.2	42.4	Vendor Internal TRM - Lighting
	Exterior Time Clocks for Lighting	Watt controlled	12,611	0.4	0.000	5,247.4	0.0	Vendor Internal TRM - Lighting
	Garage Bi-Level Lighting Controls	Watts controlled	1,360	1.3	0.150	1,787.0	204.0	Vendor Internal TRM - Lighting
	Garage ES or DLC LED	Unit	1,157	1,058.2	0.121	1,224,367.7	139.8	Vendor Internal TRM - Lighting
	Garage Other LED	Unit	216	836.0	0.095	180,578.6	20.6	Vendor Internal TRM - Lighting
	Garage Screw-in LED	Unit	37	306.9	0.015	11,353.5	0.6	Vendor Internal TRM - Lighting
	Garage Occupancy Sensor	Watt controlled	16,184	0.3	0.000	4,855.2	5.1	Vendor Internal TRM - Lighting
	Garage Occupancy + Daylighting Sensor	Watt controlled	7,500	0.3	0.001	2,415.0	10.1	Vendor Internal TRM - Lighting
	Interior Daylighting Controls	Watt controlled	10,065	0.9	0.001	9,066.8	6.8	Vendor Internal TRM - Lighting
	Interior ES or DLC LED	Unit	290,164	256.8	0.058	74,518,799.1	16,742.4	Vendor Internal TRM - Lighting
	Interior Exit Sign	Sign	1,800	92.7	0.012	166,790.5	22.0	Vendor Internal TRM - Lighting
	Interior Linear Fluorescent Retrofit	Lamp	42	277.7	0.062	11,662.6	2.6	Vendor Internal TRM - Lighting
	Interior New T8/T5 Fixture	Unit	576	247.5	0.056	142,575.5	32.0	Vendor Internal TRM - Lighting
	Interior New T8 Fluorescent Fixtures	Unit	28	828.6	0.186	23,200.5	5.2	Vendor Internal TRM - Lighting
	Interior Occupancy + Daylighting Sensor	Watt controlled	37,163	1.6	0.000	58,574.1	12.5	Vendor Internal TRM - Lighting
	Interior Occupancy Sensor	Watt controlled	1,296,154	1.1	0.000	1,488,853.7	117.9	Vendor Internal TRM - Lighting
	Interior Other LED	Unit	37,029	206.9	0.046	7,660,704.0	1,720.6	Vendor Internal TRM - Lighting
	Interior Screw-in LED	Unit	80,788	200.9	0.026	16,232,134.9	2,085.9	Vendor Internal TRM - Lighting
	Interior Time Clocks for Lighting	Watt controlled	71,032	0.4	0.000	28,709.0	0.0	Vendor Internal TRM - Lighting
	LED Traffic Lights Green 12"	Unit	80	519.8	0.059	41,584.0	4.7	Vendor Internal TRM - Lighting
	LED Traffic Lights Green 8"	Unit	88	226.0	0.026	19,888.0	2.3	Vendor Internal TRM - Lighting
	LED Traffic Lights Red 12"	Unit	80	693.8	0.079	55,504.0	6.3	Vendor Internal TRM - Lighting
	LED Traffic Lights - Red 8"	Unit	88	298.7	0.034	26,285.6	3.0	Vendor Internal TRM - Lighting
	LED Traffic Lights - Walk/Don't Walk 12"	Unit	35	946.1	0.052	33,112.8	1.8	Vendor Internal TRM - Lighting
	Suite ES or DLC LED	Unit	394	13.5	0.002	5,325.2	0.8	Vendor Internal TRM - Lighting
	Suite Screw-in LED	Unit	6,778	37.8	0.008	255,952.6	52.2	Vendor Internal TRM - Lighting
	Suite New T8/T5 Fixture	Unit	64	356.7	0.080	22,830.3	5.1	Vendor Internal TRM - Lighting
	High Efficiency Electric Hot Water Heater	Unit	2	4,703.4	1.030	9,406.8	2.1	Vendor Internal TRM - Miscellaneous
	Chilled Water Pump	Unit	17	21,399.2	4.019	363,785.7	68.3	Vendor Internal TRM - Motors and Drives
	Cooling Tower Fan	Unit	12	11,025.0	3.658	132,299.5	43.9	Vendor Internal TRM - Motors and Drives
	Hot Water Pump	Unit	18	3,396.4	0.010	61,134.8	0.2	Vendor Internal TRM - Motors and Drives
	Process Motor	Unit	64	30,355.4	4.178	1,942,746.8	267.4	Vendor Internal TRM - Motors and Drives
	Supply/Return Fan	Unit	199	6,023.8	1.021	1,198,737.2	203.3	Vendor Internal TRM - Motors and Drives
	NEMA Premium Efficiency Motor	Unit	32	5,831.5	0.698	186,608.0	22.3	Vendor Internal TRM - Motors and Drives
	Pool Pump Motor	Unit	8	17,600.8	0.149	140,806.0	1.2	Vendor Internal TRM - Motors and Drives
	Anti-Sweat Heater Controls	Unit	1,045	528.0	0.060	551,654.4	62.7	Vendor Internal TRM - Refrigeration
	EC Motor for Evaporator Fan Controls	Unit	60	1,351.0	0.154	81,060.0	9.2	Vendor Internal TRM - Refrigeration
	EC Motor for Reach-in Refrigerator cases and Freezer cases	Unit	681	625.0	0.071	425,625.0	48.4	Vendor Internal TRM - Refrigeration
	EC Motor for Walk-in Cooler and Freezer	Unit	25	1,250.0	0.143	31,250.0	3.6	Vendor Internal TRM - Refrigeration
	ENERGY STAR Glass Door Freezer	Unit	6	725.9	0.083	4,355.4	0.5	Vendor Internal TRM - Refrigeration
	ENERGY STAR Solid Door Freezer	Unit	29	519.2	0.059	15,056.8	1.7	Vendor Internal TRM - Refrigeration
	ENERGY STAR Glass Door Refrigerator	Unit	24	356.0	0.041	8,544.5	1.0	Vendor Internal TRM - Refrigeration
	ENERGY STAR Solid Door Refrigerator	Unit	45	197.7	0.023	8,896.5	1.0	Vendor Internal TRM - Refrigeration
	LED Refrigeration Case Lighting - Open Cases	Unit	2,785	365.1	0.063	1,016,674.8	174.2	Vendor Internal TRM - Refrigeration
	LED Refrigeration Case Lighting - With Doors	Unit	2,753	413.3	0.067	1,137,744.6	183.4	Vendor Internal TRM - Refrigeration
	New Doors on Medium Temp Open Refrigerated Case	Unit	117	395.6	0.045	46,082.7	5.3	Vendor Internal TRM - Refrigeration
	Oversized Condenser for Refrigeration	Ton	103	120.0	0.120	12,336.0	12.3	Vendor Internal TRM - Refrigeration
	TOTAL					143,106,154	24,683.9	

Program	Measure	Unit	Units	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Ex Ante kWh Savings	Ex Ante kW Savings	Source Document
Self Direct	Our largest existing powder compacting press is a hydraulic powered press which is the same type of operation, but is rated at 3500Kn (392 ton). This machine is roughly half the tonnage.	Custom Measure	1	285,946.7	47.660	285,946.7	47.7	All Custom Measures are individually calculated using methodology consistent with the Draft Ohio 2010 Technical Reference Manual.
	Combination Oven	Oven	2	11,502.0	1.059	23,004.0	2.1	Vendor Internal TRM - Food Service
	Air-source Heat Pump - <= 5.4 tons	Unit	3	846.8	0.473	2,540.3	1.4	Vendor Internal TRM - Cooling
	Air-source Heat Pump - 5.4 - 11.24 tons	Unit	1	1,059.0	0.595	1,059.0	0.6	Vendor Internal TRM - Cooling
	Air-source Heat Pump - 11.25 - 19.9 tons	Unit	2	2,493.2	1.402	4,986.4	2.8	Vendor Internal TRM - Cooling
	Cooling Tower Fan	Unit	1	9,009.0	1.689	9,009.0	1.7	Vendor Internal TRM - Motors & Drives
	Supply/Return Fan	Unit	5	12,234.7	3.121	61,173.7	15.6	Vendor Internal TRM - Motors & Drives
	Interior Occupancy Sensor	Watt controlled	672	1.4	0.000	972.6	0.0	Vendor Internal TRM - Lighting
	Exterior Photocell	Watt controlled	736	0.3	0.000	241.9	-	Vendor Internal TRM - Lighting
	Exterior DLC or ES LED	Unit	8	1,268.6	0.000	10,148.7	-	Vendor Internal TRM - Lighting
	Exterior Other LED	Unit	12	1,681.0	0.000	20,172.5	-	Vendor Internal TRM - Lighting
	Exterior LPD	Watt reduced	262	4.2	0.000	1,091.2	-	Vendor Internal TRM - Lighting
	Interior Exit Sign	Sign	39	81.2	0.010	3,167.0	0.4	Vendor Internal TRM - Lighting
	Interior Screw-in LED	Unit	11,612	199.5	0.029	2,316,053.8	341.7	Vendor Internal TRM - Lighting
	Interior ES or DLC LED	Unit	659	316.6	0.071	208,664.0	46.9	Vendor Internal TRM - Lighting
	Interior Other LED	Unit	323	161.0	0.036	52,006.2	11.7	Vendor Internal TRM - Lighting
	Interior LPD	Watt reduced	211,282	3.1	0.001	656,938.4	146.6	Vendor Internal TRM - Lighting
	TOTAL					3,657,175	619.2	
Express	Occupancy Sensor	Unit	136	273.2	0.000	37,149.8	0.0	New York State TRM - Lighting
	Photocells	Unit	121	107.8	0.000	13,044.1	0.0	New York State TRM - Lighting
	Exterior LED	Unit	3,426	892.6	0.000	3,058,156.3	0.0	New York State TRM - Lighting
	Exterior T8 Fluorescent	Unit	3	263.7	0.000	791.0	0.0	New York State TRM - Lighting
	Garage LED	Unit	1,636	598.2	0.137	978,578.9	224.0	New York State TRM - Lighting
	Garage Exit Signs	Unit	6	332.9	0.038	1,997.3	0.2	New York State TRM - Lighting
	Interior Exit Signs	Unit	813	284.0	0.028	230,882.7	22.4	New York State TRM - Lighting
	Interior LED	Unit	33,372	299.4	0.058	9,991,273.2	1,934.4	New York State TRM - Lighting
	Interior T8 Fluorescent	Unit	45	179.4	0.017	8,071.9	0.8	New York State TRM - Lighting
	Interior Light - Disconnect Only	Unit	144	693.9	0.150	99,923.6	21.6	New York State TRM - Lighting
	Exterior Light - Disconnect Only	Unit	6	674.3	0.000	4,045.9	0.0	New York State TRM - Lighting
	Exterior Exit Signs	Unit	1	332.9	0.000	332.9	0.0	New York State TRM - Lighting
	Anti Sweat Heater Control	Unit	129	8,694.8	0.220	1,121,623.5	28.4	Pennsylvania TRM - Refrigeration
	Compressor and Intelligent Fan Management	Unit	1,009	855.5	0.072	863,181.3	72.8	New York State TRM - Refrigeration
	Refrigeration LED Case Lighting	Unit	151	5,092.1	0.760	768,907.1	114.7	New York State TRM - Refrigeration
	TOTAL					17,177,959	2,419.3	
Data Center	Computer Room Air Conditioner	Unit	12	111,016.5	13.375	1,332,198.0	160.5	Standard Engineering Calculation
	Computer Room Air Handler	Unit	2	40,989.4	4.680	81,978.7	9.4	Standard Engineering Calculation
	HVAC Equipment Optimization	Unit	2	281,362.0	32.950	562,724.0	65.9	Standard Engineering Calculation
	HVAC/equipment/variable frequency drive	Unit	6	59,907.5	8.667	359,445.0	52.0	Standard Engineering Calculation
	IT/equipment/virtualization	Unit	6	37,694.2	2.783	226,165.0	16.7	Standard Engineering Calculation
	Non Residential Whole Building Model	Unit	3	10,556,994.3	1243.767	31,670,983.0	3,731.3	Individually modeled by Implementer
	Systemic/Equipment/Energy Management System	Unit	1	1,864,564.0	212.800	1,864,564.0	212.8	Standard Engineering Calculation
	TOTAL					36,098,058	4,248.6	
Continuous Energy Improvement	Multivariate Linear Regression	Project	57	298,198.5	23.454	16,997,313	1,336.9	Individually modeled by Implementer
	TOTAL					16,997,313	1,337	
Combined Heat & Power	Combined Heat & Power	Project	2	20,343,449.4	2319.108	40,686,899	4,638.2	Measured meter readings
	TOTAL					40,686,899	4,638.2	