ENERGY CENTER OF WISCONSIN

ENERGY EFFICIENCY AND CUSTOMER-SITED RENEWABLE RESOURCE POTENTIAL IN WISCONSIN
For the years 2012 and 2018

ENERGY EFFICIENCY APPENDICES

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APPENDIX A

KEY MODELING ASSUMPTIONS

Modeling the Neighborhood Blitz

As described in Chapter EE-4, the "neighborhood blitz" is one example of an innovative program strategy targeting retrofit opportunities in the residential market. Low-income households have been the recipients of comprehensive weatherization program efforts for 30 years, and numerous evaluations of these programs have demonstrated significant and durable energy savings from these efforts. Our analysis extends the low-income weatherization concept to non low-income programs, and estimates the statewide achievable potential from a large-scale effort to weatherize older housing stock. Such an effort could take the form of geographically-targeted "neighborhood blitzes" with highly subsidized measures and turn-key measure installation increase uptake. However, other program approaches could also be viable.

We used low-income weatherization program evaluation results to estimate the likely energy savings for high, medium, and low gas users. Percentage savings are highest for the first end user category and lowest for the last. We also assumed that such an effort would result in 15 percent electricity savings, of which two thirds of the savings could easily be delivered through a comprehensive direct-installation of CFLs. Since the intent of such site-intensive programs is to install as many measures as can be cost-justified, the savings and estimated costs are estimated such that the TRC is close to unity in all cases, with an assumption that repair and health-and-safety measure costs will be somewhat lower than those found in low-income programs.

A key aspect of the analysis is an estimate of how many households such a program could reach in 2012. The Wisconsin low-income weatherization program currently treats about 10,000 households per year, and is ramping up in anticipation of a significant increase in federal funding. Based on analysis of staffing levels for the Wisconsin low-income weatherization program and discussion with WECC staff, our estimates assume that an aggressive statewide non low-income program could reach about 30,000 households per year n 2012.

Assumptions for Key Measures

CFLS

CFLs currently constitute a substantial proportion of the electricity savings from Wisconsin's Focus on Energy program, but the landscape is shifting rapidly as large retailers such as Wal-Mart aggressively promote these energy-efficient bulbs. Moreover, from 2012 to 2014, new federal standards will phase in that require general-purpose light bulbs to be 25 to 30 percent more efficient than current incandescents—a requirement that some manufacturers claim they will meet with improved incandescents (though subsequent to our analysis, one major manufacturer— General Electric—announced abandoning such plans).

These factors make it difficult to predict the residential lighting market in 2012, which is the first year of the phase-in period for the new federal standards (only high-wattage bulbs are affected in that year). Not surprisingly, Delphi respondents varied considerably in their opinions as to the baseline market share for

CFLs in 2012, though the majority opined that the lighting market would still be dominated by incandescents at that time. Accordingly, we modeled potential for a program-induced 20 percentage point increase in the CFL market share, though it should be noted that—given the increasing baseline market share for CFLs—achieving such a gain through voluntary programs will likely require upstream market approaches to avoid significant free ridership issues associated with consumer incentives.

WHOLE-HOUSE ELECTRICITY-USE FEEDBACK DISPLAY

This measure entails installation of a device to allow residents to monitor their electricity use in real time, thus providing better information about how and when electricity is being used in the home, and associated costs. A few studies on the savings associated with these devices have been completed, and more are underway, including one in Wisconsin funded through Focus on Energy. Savings estimates have ranged as high as 15 percent, but the preponderance of evidence suggests savings of five percent or less. Our model used four percent savings for this measure, and assumes that by 2012, aggressive program efforts could be placing these devices in approximately 75,000 homes per year.

SETBACK THERMOSTATS

Prior research by the Energy Center (and others) suggested little incremental savings potential from promoting setback thermostats in homes, because most households that are inclined to set back the thermostat already do so. However, a recent study sponsored by GasNetworks showed about 7 ±2 percent savings in households that received a setback thermostat compared to a control group. As a way of reconciling these divergent estimates, we modeled programmable thermostats as having between a two and three percent average impact on natural gas consumption.

APPENDIX B

MEASURE INPUTS

Input Table Definitions

Segment: Applicable market segment for the energy efficiency measure. The residential sector is broken into four market segments: single family homes (SF), mobile homes (MH), small rental (RS, 1-4 units) and large rental (RL, 5+ units). The commercial and industrial sectors were segmented by principal business activity according to CBECS and NAICS classifications, respectively.

Market: Equipment market that is applicable to the measure: New Construction (NC), Retrofit, or Replace on Burnout (ROB).

End Use: Major energy end use category (lighting, HVAC, etc.) that applies to the measure.

Measure: Short description of the measure.

Base Saturation: In the residential sector, the base saturation is the number of homes that possess the base technology applicable to the measure. In the commercial, industrial and agricultural sectors, base saturation is expressed in terms of energy rather than as a percentage of existing building stock. The base saturation considers the percentage of housing stock or energy consumption for which a conversion to the energy-efficient technology is feasible. For example, for a boiler measure in the 'Office' segment, base saturation represents the percentage of office building energy consumption that is used by boilers AND which is eligible for conversion to a higher efficiency unit.

EE Saturation: Energy Efficient (EE) saturation is the percentage of housing units or energy consumption within the base saturation (as defined above) that already possesses the energy-efficient technology.

Technical Savings Rate: The percentage of base energy consumption that is saved by implementing the energy-efficient measure.

Measure Useful Life: The duration of time for which the measure is expected to provide savings, based on the median lifetime of installed measures and expressed in years.

Base Annual Market Size Applicable to Measure (GWh or BBtu): The total amount of energy that is available on an annual basis for applying a specific energy saving measure. For the Retrofit market, this quantity is a function of the percentage of homes or energy that is considered to possess or utilize the base technology. The ROB market is the product of the inverse of the base technology's useful life and base consumption per unit. The NC market is reliant upon sector population growth rates. The base annual market size is multiplied by the technical savings rate and the 'Annual Impact of Aggressive Programs' to determine the annual achievable potential (before interaction).

Delphi Entry (O, L, M, or H): Measures included in a Delphi survey
are identified with an "O." Non-Delphi measures were ranked low,

medium, or high potential (L=Low, M=Medium, or H=High) based on a qualitative assessment of the degree to which aggressive programs could 'move' the marketplace. Non-Delphi measures were ranked low, medium, or high potential based on the effective base saturation, current EE saturation levels, and useful life.

Annual Impact of Aggressive Programs (%): Also referred to as the "achievable factor" in the Methodology section of the main report, these percentages represent the portion of the market that can be induced to convert to the energy-efficient measure under the most aggressive programs on an annual basis.

Load Reduction Factor (kW/kWh): Correlates energy savings (kWh) to demand savings (kW). These factors consider the percentage of demand coincidence with summer months and are sector, segment and application specific.

TRC Ratio: The ratio of the present value of lifetime savings to the total measure cost, given the model's global inputs (such as avoided cost, discount rate and the assumed cost of carbon). The total measure cost includes both technology and program administrative costs.

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
SF	NC	Water Heating	New Construction, Improved Plumbing Desig	30%	5%	10%	50	15.2	H	25%	0.00020	1.38
		Space Cooling	New Construction, Sub-Slab Ventilation	100%	10%	50%	30	8.7	H	25%	0.00050	0.61
		Other	New Construction, Whole-house Electricity-U	100%	1%	5%	8	144.5	M	13%	0.00014	0.72
	Retrofit	Space Heating	ECM Blower Retrofit for Furnace	75%	15%	35%	15	1305.7	L	1%	0.00038	0.80
			Heating system fuel switch - Electric to Gas	1%	0%	100%	40	216.7	H	8%	0.00000	0.82
		Water Heating	Drainwater Heat Recovery	26%	1%	16%	14	1517.0	H	8%	0.00020	0.63
			Faucet aerator (3 per home)	21%	40%	15%	9	60.7	M	5%	0.00020	0.43
			Hot Water Demand Recirculation	28%	21%	4%	15	1415.9	H	8%	0.00020	0.30
			Low Flow Showerhead	28%	10%	15%	9	708.0	M	5%	0.00020	4.74
			Pipe Wrap	28%	18%	4%	10	1415.9	M	5%	0.00020	1.50
			Shower Controls (Shower Start Technology)	28%	0%	10%	10	566.4	M	5%	0.00020	1.45
			Water Heater Blanket	28%	21%	4%	10	1415.9	M	5%	0.00020	1.35
		Space Cooling	CAC Tune-Up	73%	47%	5%	10	949.2	H	8%	0.00333	0.41
			Room A/C Turn In	1%	0%	100%	9	6.1	L	1%	0.00333	7.83
			Whole House Fan	73%	20%	5%	10	949.2	M	5%	0.00333	0.25
		Other	Whole House Green Switch	100%	0%	5%	12	14448.0	M	5%	0.00014	0.32
			Whole-house Electricity-Use Feedback Disp	100%	1%	3%	8	14448.0	M	5%	0.00014	1.03
		Lighting	Exterior Lighting Controls	75%	50%	50%	12	487.6	L	1%	0.00000	2.30
			High Efficiency Lighting Fixtures	25%	25%	66%	14	2600.6	L	1%	0.00007	2.00
		Home Appliance	Second Freezer Turn In	5%	0%	100%	5	55.9	M	4%	0.00007	1.17
			Second Refrigerator Turn In	22%	0%	100%	5	310.9	M	1%	0.00007	1.41
			Smart Power Strip	100%	25%	37%	5	349.6	M	5%	0.00014	0.48

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
SF	ROB	Space Heating	ECM Furnace	75%	15%	50%	15	124.6	M	25%	0.00038	1.30
		Water Heating	Efficient Electric Water Heater	30%	8%	5%	13	131.9	H	25%	0.00020	2.18
			Energy Star Clothes Washer (w/ Elec. WH &	26%	17%	40%	14	48.9	O	10%	0.00020	2.16
			Energy Star Clothes Washer (w/ Elec. WH &	1%	17%	60%	14	0.7	M	10%	0.00020	1.68
			Energy Star Dishwasher (Electric Water Hea	13%	22%	29%	12	8.2	L	4%	0.00020	3.86
			Heat Pump Water Heater	28%	5%	55%	20	85.0	M	5%	0.00020	1.91
			Water Heater fuel switch	11%	0%	100%	15	42.6	M	1%	0.00020	0.86
		Space Cooling	2-Stage Central AC	73%	5%	15%	20	57.0	H	25%	0.00333	0.59
			Ceiling Fan Efficiency Upgrade	63%	40%	20%	10	29.5	M	13%	0.00333	0.92
			Cool Roof	75%	5%	5%	15	74.8	M	13%	0.00333	0.12
			Ductless mini-split Equipment Upgrade	10%	1%	30%	14	9.4	M	10%	0.00333	0.21
			Energy Star Room A/C	11%	25%	9%	9	8.1	M	13%	0.00333	0.33
			High Efficiency Central AC (Tier 1)	73%	8%	7%	20	44.3	M	15%	0.00333	0.40
			High Efficiency Central AC (Tier 2)	73%	8%	13%	20	44.3	M	15%	0.00333	0.37
		Lighting	CFL Bulbs, purchased replacement (2012)	100%	20%	66%	6	467.0	M	20%	0.00007	2.72
			LED Bulbs, purchased replacement (2012)	100%	1%	84%	20	467.0	M	10%	0.00007	2.09
			LED Bulbs, purchased replacement (2018)	100%	1%	77%	30	189.7	M	0%	0.00007	1.75
			LED Exterior Lighting	75%	0%	18%	14.63	38.2	L	4%	0.00000	0.11
			LED Holiday Lighting	75%	10%	86%	9	3.7	H	25%	0.00000	0.91
		Home Appliance	Convection Oven	63%	15%	20%	14	54.1	H	25%	0.00027	0.26
			Dryer Fuel Switch	59%	0%	100%	12	99.8	L	4%	0.00027	1.86
			Dryer With Moisture Sensor	74%	15%	15%	12	79.8	H	25%	0.00027	1.58
			Energy Star Compliant Chest Freezer	36%	13%	10%	20	13.9	H	25%	0.00007	0.83
			Energy Star Compliant Personal Computer	72%	25%	25%	7	27.8	L	4%	0.00014	2.23
			Energy Star Compliant Side-by-Side Refrige	20%	18%	20%	19	12.7	H	20%	0.00007	0.73
			Energy Star Compliant Top/Bottom-Freezer	90%	18%	20%	19	41.4	M	20%	0.00007	0.89
			Energy Star Compliant Upright Freezer (Mar	25%	13%	10%	20	10.6	M	20%	0.00007	0.93
			Energy Star Dehumidifer	64%	10%	22%	12	51.8	L	4%	0.00050	2.61
			Heat Pump Clothes Dryer	74%	0%	40%	15	65.6	L	4%	0.00027	0.87
			Home Electronics Efficiency Upgrade (Energ	100%	15%	25%	8	97.5	M	13%	0.00014	4.54
			Induction Cooktop	63%	10%	13%	12	54.3	H	25%	0.00027	0.08
			Range/Oven Fuel Switch	52%	0%	100%	15	72.0	L	4%	0.00027	2.05

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RS	NC	Water Heating	New Construction, Improved Plumbing Desig	25%	5%	10%	50	3.6	H	13%	0.00020	1.25
	Retrofit	Space Heating	ECM Blower Retrofit for Furnace	80%	5%	25%	15	436.7	L	1%	0.00038	0.59
			Heating system fuel switch - Electric to Gas	5%	0%	100%	40	184.3	H	4%	0.00000	0.64
		Water Heating	Drainwater Heat Recovery	23%	1%	16%	14	377.6	H	4%	0.00020	0.60
			Faucet aerator (2 per home)	18%	40%	15%	9	23.2	M	3%	0.00020	0.87
			Hot Water Demand Recirculation	24%	21%	4%	15	362.5	H	4%	0.00020	0.28
			Low Flow Showerhead	24%	10%	15%	9	181.3	M	3%	0.00020	5.39
			Pipe Wrap	24%	30%	4%	10	362.5	M	3%	0.00020	1.44
			Shower Controls (Shower Start Technology)	24%	0%	10%	10	144.9	M	3%	0.00020	1.40
			Water Heater Blanket	24%	21%	4%	10	362.5	M	3%	0.00020	1.86
		Space Cooling	CAC Tune-Up	14%	47%	5%	10	57.1	H	4%	0.00333	0.40
			Room A/C Turn In	22%	0%	100%	9	23.6	L	1%	0.00333	6.85
			Whole House Fan	14%	20%	5%	10	38.1	M	3%	0.00333	0.25
		Other	Whole House Green Switch	100%	0%	5%	12	4530.7	M	3%	0.00014	0.32
		Lighting	Common Area Lighting Improvements in Mu	25%	20%	66%	6.85	115.1	H	10%	0.00007	1.60
			Exit Lighting Improvements in Multifamily	15%	20%	66%	6.85	10.4	M	3%	0.00011	0.79
			Exterior Lighting Controls	60%	15%	50%	12	110.5	L	1%	0.00000	4.06
			High Efficiency Lighting Fixtures	25%	25%	66%	14	621.4	L	1%	0.00007	1.91
		Home Appliance	Second Freezer Turn In	1%	0%	100%	5	3.5	M	4%	0.00007	1.15
			Second Refrigerator Turn In	3%	0%	100%	5	11.5	M	1%	0.00007	1.23
			Smart Power Strip	100%	25%	37%	5	109.6	M	3%	0.00014	0.47
	ROB	Space Heating	ECM Furnace	80%	5%	50%	15	42.3	M	13%	0.00038	1.30
		Water Heating	Efficient Electric Water Heater	25%	8%	5%	13	32.8	H	13%	0.00020	2.88
			Energy Star Clothes Washer (w/ Elec. WH &	23%	10%	40%	14	10.3	M	10%	0.00020	2.16
			Energy Star Clothes Washer (w/ Elec. WH &	2%	10%	60%	14	0.3	M	10%	0.00020	1.68
			Energy Star Dishwasher (Electric Water Hea	24%	22%	52%	12	2.6	L	2%	0.00020	3.82
			Heat Pump Water Heater	24%	0%	55%	20	21.7	M	3%	0.00020	2.53
			Water Heater fuel switch	4%	0%	100%	15	4.6	M	1%	0.00020	0.83
		Space Cooling	2-Stage Central AC	14%	2%	15%	20	3.4	H	13%	0.00333	0.59
			Ceiling Fan Efficiency Upgrade	10%	40%	20%	10	1.5	M	6%	0.00333	0.91
			Cool Roof	75%	5%	6%	15	15.6	M	6%	0.00333	0.15
			Ductless mini-split Equipment Upgrade	14%	1%	30%	14	3.1	M	10%	0.00333	0.16
			Energy Star Room A/C	60%	25%	9%	9	7.8	M	6%	0.00333	0.18
			High Efficiency Central AC (Tier 1)	14%	8%	7%	20	2.3	M	8%	0.00333	0.33
			High Efficiency Central AC (Tier 2)	14%	8%	13%	20	2.3	M	8%	0.00333	0.31
		Lighting	CFL Bulbs, purchased replacement (2012)	100%	15%	66%	6	74.4	M	20%	0.00007	2.72
			LED Bulbs, purchased replacement (2012)	100%	1%	84%	20	74.4	M	10%	0.00007	2.09
			LED Bulbs, purchased replacement (2018)	100%	1%	77%	30	27.9	M	0%	0.00007	1.62
			LED Exterior Lighting	60%	0%	26%	14.63	8.7	L	2%	0.00000	0.22
			LED Holiday Lighting	60%	10%	86%	9	0.7	H	13%	0.00000	0.91
		Home Appliance	Convection Oven	50%	5%	20%	14	13.5	H	13%	0.00027	0.25
			Dryer Fuel Switch	59%	0%	100%	12	23.8	L	2%	0.00027	1.50
			Dryer With Moisture Sensor	74%	15%	15%	12	14.3	H	13%	0.00027	0.94

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
RS	ROB	Home Appliance	Energy Star Compliant Chest Freezer	10%	7%	10%	20	1.2	H	13%	0.00007	0.82

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
RS	ROB	Home Appliance	Energy Star Compliant Personal Computer	72%	25%	25%	7	8.9	L	2%	0.00014	2.23
			Energy Star Compliant Side-by-Side Refrige	8%	15%	20%	19	1.6	M	20%	0.00007	0.72
			Energy Star Compliant Top/Bottom-Freezer	92%	15%	20%	19	13.3	M	20%	0.00007	0.88
			Energy Star Compliant Upright Freezer (Mar	7%	7%	10%	20	0.9	M	20%	0.00007	0.91
			Energy Star Dehumidifer	4%	10%	13%	12	0.7	L	2%	0.00050	1.20
			Heat Pump Clothes Dryer	74%	0%	40%	15	11.8	L	2%	0.00027	0.51
			Home Electronics Efficiency Upgrade (Energ	100%	15%	25%	8	23.3	M	6%	0.00014	4.08
			Induction Cooktop	49%	10%	13%	12	13.2	H	13%	0.00027	0.08
			Range/Oven Fuel Switch	52%	0%	100%	15	17.2	L	2%	0.00027	1.34

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
RL	NC	Water Heating	New Construction, Improved Plumbing Desig	20%	5%	20%	50	1.5	H	13%	0.00020	3.19
	Retrofit	Space Heating	ECM Blower Retrofit for Furnace	15%	5%	25%	15	41.7	L	1%	0.00038	0.44
			Heating system fuel switch - Electric to Gas	10%	0%	100%	40	165.0	H	4%	0.00000	0.60
		Water Heating	Drainwater Heat Recovery	10%	1%	16%	14	164.4	H	4%	0.00020	0.88
			Faucet aerator (2 per home)	24%	40%	15%	9	21.1	M	3%	0.00020	0.83
			Hot Water Demand Recirculation	32%	21%	4%	15	263.1	H	4%	0.00020	0.21
			Low Flow Showerhead	32%	10%	15%	9	130.7	M	3%	0.00020	4.34
			Pipe Wrap	32%	21%	4%	10	263.1	M	3%	0.00020	1.10
			Shower Controls (Shower Start Technology)	32%	0%	10%	10	104.6	M	3%	0.00020	1.08
			Water Heater Blanket	32%	7%	4%	10	263.1	M	3%	0.00020	6.43
		Space Cooling	CAC Tune-Up	6%	47%	5%	10	17.8	H	4%	0.00333	0.41
			Room A/C Turn In	3%	0%	100%	9	4.0	L	1%	0.00333	10.02
		Other	Whole House Green Switch	100%	0%	5%	12	1877.6	M	3%	0.00014	0.18
		Lighting	Common Area Lighting Improvements in Mu	95%	75%	40%	6.85	156.7	H	10%	0.00007	1.44
			Exit Lighting Improvements in Multifamily	95%	75%	30%	6.85	31.3	M	3%	0.00011	0.52
			Exterior Lighting Controls	75%	50%	50%	12	24.7	L	1%	0.00000	1.80
			High Efficiency Lighting Fixtures	25%	25%	66%	14	237.5	L	1%	0.00007	2.26
		Home Appliance	Second Freezer Turn In	0%	0%	100%	5	0.0	L	1%	0.00007	1.17
			Second Refrigerator Turn In	3%	0%	100%	5	9.7	M	1%	0.00007	1.41
			Smart Power Strip	100%	25%	37%	5	79.8	M	3%	0.00014	0.48
	ROB	Space Heating	ECM Furnace	15%	5%	50%	15	5.7	M	13%	0.00038	1.30
		Water Heating	Efficient Electric Water Heater	20%	8%	5%	13	14.3	H	13%	0.00020	2.32
			Energy Star Clothes Washer (w/ Elec. WH &	23%	5%	40%	14	4.0	M	10%	0.00020	3.65
			Energy Star Clothes Washer (w/ Elec. WH &	2%	5%	60%	14	0.1	M	10%	0.00020	3.18
			Energy Star Dishwasher (Electric Water Hea	32%	22%	29%	12	1.5	L	2%	0.00020	1.64
			Heat Pump Water Heater	32%	0%	55%	20	15.8	M	3%	0.00020	2.04
			Water Heater fuel switch	5%	0%	100%	15	3.2	M	1%	0.00020	0.65
		Space Cooling	2-Stage Central AC	6%	1%	15%	20	0.5	H	13%	0.00333	0.30
			Ceiling Fan Efficiency Upgrade	6%	40%	20%	10	0.6	M	6%	0.00333	0.92
			Cool Roof	80%	5%	6%	15	8.1	M	6%	0.00333	0.80
			Ductless mini-split Equipment Upgrade	70%	1%	30%	14	7.5	M	10%	0.00333	0.11
			Energy Star Room A/C	68%	25%	9%	9	10.9	M	6%	0.00333	0.31
			High Efficiency Central AC (Tier 1)	6%	8%	7%	20	0.5	M	8%	0.00333	0.23
			High Efficiency Central AC (Tier 2)	6%	8%	13%	20	0.5	M	8%	0.00333	0.21
		Lighting	CFL Bulbs, purchased replacement (2012)	100%	15%	66%	6	40.0	M	20%	0.00007	2.72
			LED Bulbs, purchased replacement (2012)	100%	1%	84%	20	40.0	M	10%	0.00007	1.25
			LED Bulbs, purchased replacement (2018)	100%	1%	77%	30	16.7	M	0%	0.00007	1.41
			LED Exterior Lighting	75%	0%	18%	14.63	1.9	L	2%	0.00000	0.29
			LED Holiday Lighting	50%	10%	86%	9	0.3	H	13%	0.00000	0.91
		Home Appliance	Convection Oven	80%	5%	20%	14	15.7	H	13%	0.00027	0.26
			Dryer Fuel Switch	59%	0%	100%	12	9.1	L	2%	0.00027	0.69
			Dryer With Moisture Sensor	74%	15%	15%	12	7.3	H	13%	0.00027	0.68

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
RL	ROB	Home Appliance	Energy Star Compliant Chest Freezer	4%	7%	10%	20	0.4	H	20%	0.00007	0.83
			Energy Star Compliant Personal Computer	72%	25%	25%	7	6.4	L	2%	0.00014	2.23
			Energy Star Compliant Side-by-Side Refrige	2%	15%	20%	19	0.2	M	20%	0.00007	0.64
			Energy Star Compliant Top/Bottom-Freezer	98%	15%	20%	19	8.2	M	20%	0.00007	0.67
			Energy Star Compliant Upright Freezer (Mar	3%	7%	10%	20	0.3	M	20%	0.00007	0.93
			Energy Star Dehumidifer	4%	10%	13%	12	0.5	L	2%	0.00050	1.20
			Heat Pump Clothes Dryer	74%	0%	40%	15	6.0	L	2%	0.00027	0.36
			Home Electronics Efficiency Upgrade (Energ	100%	15%	25%	8	14.5	M	6%	0.00014	3.54
			Induction Cooktop	78%	10%	13%	12	15.3	H	13%	0.00027	0.08
			Range/Oven Fuel Switch	16%	0%	100%	15	8.1	L	2%	0.00027	1.07

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
MH	Retrofit	Space Heating	ECM Blower Retrofit for Furnace	80%	0%	25%	15	52.9	L	1%	0.00038	0.36
			Heating system fuel switch - Electric to Gas	3%	0%	100%	40	31.7	H	8%	0.00000	0.69
		Water Heating	Faucet aerator (2 per home)	43%	40%	15%	9	10.5	M	5%	0.00020	0.87
			Hot Water Demand Recirculation	57%	21%	4%	15	175.8	H	8%	0.00020	0.30
			Low Flow Showerhead	57%	10%	15%	9	87.9	M	5%	0.00020	4.74
			Pipe Wrap	57%	18%	4%	10	175.8	M	5%	0.00020	1.50
			Shower Controls (Shower Start Technology)	57%	0%	10%	10	70.3	M	5%	0.00020	1.45
			Water Heater Blanket	57%	21%	4%	10	175.8	M	5%	0.00020	1.35
		Space Cooling	CAC Tune-Up	44%	47%	5%	10	31.0	H	8%	0.00333	0.37
			Room A/C Turn In	14%	0%	100%	9	5.2	L	1%	0.00333	7.83
		Other	Whole House Green Switch	100%	0%	5%	12	792.9	M	5%	0.00014	0.29
			Whole-house Electricity-Use Feedback Disp	100%	1%	3%	8	704.8	M	5%	0.00014	0.78
		Lighting	Exterior Lighting Controls	75%	50%	50%	12	26.4	L	1%	0.00000	2.10
			High Efficiency Lighting Fixtures	25%	25%	66%	14	118.9	L	1%	0.00007	1.60
		Home Appliance	Second Freezer Turn In	1%	0%	100%	5	0.7	M	4%	0.00007	1.17
			Second Refrigerator Turn In	10%	0%	100%	5	7.5	M	1%	0.00007	1.26
			Smart Power Strip	100%	25%	37%	5	21.3	M	5%	0.00014	0.48
	ROB	Space Heating	ECM Furnace	80%	0%	50%	15	8.1	M	25%	0.00038	1.30
		Water Heating	Efficient Electric Water Heater	60%	8%	5%	13	16.1	H	25%	0.00020	2.18
			Energy Star Clothes Washer (w/ Elec. WH &	28%	17%	40%	14	3.2	M	10%	0.00020	2.16
			Energy Star Clothes Washer (w/ Elec. WH &	1%	17%	60%	14	0.0	M	10%	0.00020	1.68
			Energy Star Dishwasher (Electric Water Hea	27%	22%	29%	13	1.0	L	4%	0.00020	3.99
			Heat Pump Water Heater	57%	0%	55%	20	10.5	M	5%	0.00020	1.91
			Water Heater fuel switch	9%	0%	100%	15	2.1	M	1%	0.00020	0.86
		Space Cooling	2-Stage Central AC	44%	5%	15%	20	2.1	H	25%	0.00333	0.59
			Ceiling Fan Efficiency Upgrade	44%	40%	20%	10	1.3	M	13%	0.00333	0.92
			Cool Roof	50%	5%	10%	15	2.7	M	13%	0.00333	0.23
			Ductless mini-split Equipment Upgrade	44%	1%	30%	14	2.2	M	10%	0.00333	0.19
			Energy Star Room A/C	35%	25%	9%	9	1.6	M	13%	0.00333	0.33
			High Efficiency Central AC (Tier 1)	44%	8%	7%	20	1.4	M	15%	0.00333	0.34
			High Efficiency Central AC (Tier 2)	44%	8%	13%	20	1.4	M	15%	0.00333	0.32
		Lighting	CFL Bulbs, purchased replacement (2012)	100%	15%	66%	6	21.4	M	20%	0.00007	2.72
			LED Bulbs, purchased replacement (2012)	100%	1%	84%	20	21.4	M	10%	0.00007	2.29
			LED Bulbs, purchased replacement (2018)	100%	1%	77%	30	8.9	M	0%	0.00007	1.89
			LED Exterior Lighting	75%	0%	7%	14.63	2.1	L	4%	0.00000	0.04
			LED Holiday Lighting	75%	10%	86%	9	0.2	H	25%	0.00000	0.91
		Home Appliance	Convection Oven	63%	5%	20%	14	3.3	H	25%	0.00027	0.26
			Dryer Fuel Switch	50%	0%	100%	12	3.8	L	4%	0.00027	1.50
			Dryer With Moisture Sensor	62%	15%	15%	12	3.1	H	25%	0.00027	1.22
			Energy Star Compliant Chest Freezer	23%	5%	10%	20	0.5	H	25%	0.00007	0.83
			Energy Star Compliant Personal Computer	72%	25%	25%	7	1.7	L	4%	0.00014	2.23
			Energy Star Compliant Side-by-Side Refrige	12%	15%	20%	19	0.5	M	20%	0.00007	0.73

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
MH	ROB	Home Appliance	Energy Star Compliant Top/Bottom-Freezer	85%	15%	20%	19	2.4	M	20%	0.00007	0.89
			Energy Star Compliant Upright Freezer (Mar	17%	5%	10%	20	0.4	M	20%	0.00007	0.93
			Energy Star Dehumidifer	25%	10%	13%	12	0.8	L	4%	0.00050	1.20
			Heat Pump Clothes Dryer	62%	0%	40%	15	2.5	L	4%	0.00027	0.66
			Home Electronics Efficiency Upgrade (Energ	100%	15%	25%	8	5.9	M	13%	0.00014	4.54
			Induction Cooktop	63%	10%	13%	12	3.3	H	25%	0.00027	0.08
			Range/Oven Fuel Switch	28%	0%	100%	15	1.8	L	4%	0.00027	1.34

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	100%	2%	25%	50	1,445	O	10%	1.49
			New Construction (Energy Star) - Gas or LP Heat	100%	6%	10%	50	1,445	O	15%	1.32
			New Construction (Passivhaus level) -Gas or LP H	100%	0%	80%	50	1,445	O	2%	0.99
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	5%	15%	50	228	H	25%	1.11
	Retrofit	Space Heating	Boiler Controls-Gas	10%	20%	5%	10	11,558	M	5%	0.86
			Energy Efficient Windows	80%	28%	10%	30	92,467	L	1%	0.15
			Heat Recovery Ventilator	1%	70%	13%	20	1,156	M	5%	0.63
			HVAC Tune-Up (Gas Heat)	80%	50%	1%	5	92,467	M	5%	0.20
			Programmable Thermostats - gas boiler	10%	50%	3%	10	11,558	L	1%	1.86
			Programmable Thermostats - gas furnace	70%	50%	2%	10	80,909	L	1%	1.34
			Shell upgrades during remodeling	80%	25%	10%	40	92,467	L	1%	0.88
			Storm Windows	27%	95%	12%	20	30,822	O	1%	0.70
			Zoning controls	70%	20%	3%	15	80,909	M	5%	0.28
			Duct Sealing (Outside Conditioned Space)- gas	10%	5%	3%	15	11,558	L	1%	0.88
		Water Heating	Drainwater heat recovery	67%	0%	16%	40	22,756	H	8%	0.89
			Faucet aerator (Gas DHW)	53%	40%	15%	9	1,416	M	5%	0.50
			Hot Water Demand Recirulation	70%	0%	5%	15	22,756	H	8%	0.24
			Low Flow Showerhead (w/ Gas DHW)	70%	51%	15%	9	11,428	M	5%	4.53
			Pipe Wrap - gas DHW	70%	42%	1%	15	22,756	M	5%	0.46
			Shower controls	70%	0%	10%	10	7,080	M	5%	0.95
			Water heater tank wrap - Gas	28%	0%	1%	10	9,102	M	5%	0.29
		Wx	Weatherization/direct install (High gas usage)	20%	25%	20%	40	39,010	O	2%	1.09
			Weatherization/direct install (Low gas usage)	20%	60%	10%	40	14,448	O	2%	1.03
			Weatherization/direct install (Medium gas usage)	40%	35%	15%	40	46,234	O	2%	1.04

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	ROB	Space Heating	Cold Climate Heat Pump	80%	0%	100%	20	5,548	O	10%	0.11
			Dual Fuel Heat Pump	10%	0%	40%	18	758	O	10%	0.81
			Gas Absorption Heat Pump - Nat Gas	80%	0%	51%	20	5,548	O	0%	0.97
			Ground Source Heat Pump	80%	5%	100%	20	5,548	O	10%	0.55
			High Efficiency Boiler w/ indirect DHW	10%	3%	15%	20	728	M	13%	1.14
			High Efficiency Furnace - Natural Gas	70%	76%	12%	20	5,097	O	1%	2.21
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	48%	17%	45%	11	238	O	10%	1.35
			Energy Star Clothes Washer (w/ Gas WH & Gas D	24%	17%	35%	11	259	O	10%	1.04
			Energy Star Dishwasher (w/Gas DHW)	46%	38%	67%	11	126	L	4%	3.31
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	0%	28%	15	1,745	O	10%	0.90
			Heat pump water heater replacement for gas water	70%	1%	100%	20	1,365	O	3%	0.77
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	2%	7%	13	1,978	O	10%	0.43
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	0%	14%	13	1,978	O	10%	0.77
			Indirect-fired domestic water heater - NG boiler w/	15%	0%	28%	20	293	M	13%	0.94
			Whole-House Tankless Water Heater (Gas or LP)	70%	2%	30%	20	1,365	O	5%	0.70
		Home Appliance	Modulating Gas Dryer	25%	0%	20%	11	146	H	25%	0.22

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RS	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	100%	0%	25%	50	453	O	5%	1.26
			New Construction (Energy Star) - Gas or LP Heat	100%	0%	10%	50	453	O	8%	1.50
			New Construction (Passivhaus level) -Gas or LP H	100%	0%	80%	50	453	O	1%	0.64
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	5%	15%	50	48	H	13%	0.76
	Retrofit	Space Heating	Boiler Controls-Gas	5%	20%	11%	10	1,662	M	3%	2.39
			Energy Efficient Windows	65%	25%	10%	30	21,602	L	1%	0.18
			HVAC Tune-Up (Gas Heat)	92%	46%	1%	5	30,575	M	3%	0.18
			Programmable Thermostats - gas boiler	5%	40%	2%	10	1,726	L	1%	1.21
			Programmable Thermostats - gas furnace	85%	40%	3%	10	29,344	L	1%	1.81
			Shell upgrades during remodeling	80%	25%	10%	40	27,618	L	1%	0.94
			Storm Windows	65%	90%	12%	20	21,602	O	1%	0.64
			Duct Sealing (Outside Conditioned Space)- gas	15%	15%	3%	15	4,985	L	1%	0.80
		Water Heating	Drainwater heat recovery	67%	0%	16%	40	6,670	H	4%	1.21
			Faucet aerator (Gas DHW)	53%	40%	15%	9	459	M	3%	0.75
			Hot Water Demand Recirulation	70%	0%	5%	15	6,670	H	4%	0.22
			Low Flow Showerhead (w/ Gas DHW)	70%	38%	15%	9	3,319	M	3%	4.96
			Pipe Wrap - gas DHW	70%	0%	1%	15	6,670	M	3%	0.43
			Shower controls	70%	0%	10%	10	2,255	M	3%	0.95
			Water heater tank wrap - Gas	28%	0%	1%	10	2,668	M	3%	0.27
		Wx	Weatherization/direct install (High gas usage)	23%	25%	20%	40	11,392	O	2%	1.08
			Weatherization/direct install (Low gas usage)	23%	60%	10%	40	4,143	O	2%	1.03
			Weatherization/direct install (Medium gas usage)	45%	35%	15%	40	14,499	O	2%	1.04
	ROB	Space Heating	Cold Climate Heat Pump	85%	0%	100%	20	1,695	O	5%	0.20
			Dual Fuel Heat Pump	85%	1%	40%	18	1,852	O	5%	0.56
			Efficient Steam Boiler (MF) - gas	3%	0%	9%	25	42	M	6%	1.83
			Ground Source Heat Pump	85%	1%	100%	20	1,695	O	5%	0.50
			High Efficiency Boiler w/ indirect DHW	5%	13%	15%	20	100	M	6%	1.40
			High Efficiency Furnace - Natural Gas	85%	15%	12%	20	1,695	O	1%	2.77
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	51%	10%	45%	11	59	O	10%	1.33
			Energy Star Clothes Washer (w/ Gas WH & Gas D	9%	10%	35%	11	16	O	10%	1.03
			Energy Star Dishwasher (w/Gas DHW)	35%	17%	67%	11	31	L	2%	3.31
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	3%	28%	15	511	O	10%	0.83
			Heat pump water heater replacement for gas wate	70%	0%	100%	20	400	O	1%	0.75
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	3%	7%	13	580	O	10%	0.39
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	3%	14%	13	580	O	10%	0.71
			Indirect-fired domestic water heater - NG boiler w/	5%	3%	28%	20	29	M	6%	0.88
			Whole-House Tankless Water Heater (Gas or LP)	70%	0%	30%	20	400	O	5%	0.65
		Home Appliance	Modulating Gas Dryer	10%	0%	20%	11	14	H	13%	0.22

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	100%	0%	25%	50	157	O	5%	0.68
			New Construction (Energy Star) - Gas or LP Heat	100%	0%	10%	50	157	O	8%	1.33
			New Construction (Passivhaus level) -Gas or LP H	100%	0%	80%	50	157	O	1%	0.32
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	5%	15%	50	36	H	13%	0.80
	Retrofit	Space Heating	Boiler Controls-Gas	50%	40%	11%	10	6,266	M	3%	7.20
			Energy Efficient Windows	80%	50%	20%	30	10,026	L	1%	0.31
			Heat Recovery Ventilator - Buildings that exhaust I	30%	20%	7%	20	3,760	M	3%	0.56
			HVAC Tune-Up (Gas Heat)	70%	50%	1%	5	8,773	M	3%	0.10
			Mainline Air vent (MF) - gas	10%	25%	8%	30	1,253	M	3%	4.52
			Programmable Thermostats - gas boiler	50%	42%	2%	10	6,266	L	1%	0.63
			Programmable Thermostats - gas furnace	15%	42%	2%	10	1,880	L	1%	0.66
			Shell upgrades during remodeling	65%	80%	10%	40	8,575	L	1%	0.99
			Storm Windows	50%	80%	12%	20	6,266	O	1%	0.34
			Thermostatic vents (MF) - gas	10%	50%	5%	20	1,253	M	3%	0.95
			Duct Sealing (Outside Conditioned Space)- gas	1%	10%	5%	15	94	L	1%	0.68
		Water Heating	Drainwater heat recovery	49%	0%	16%	40	3,648	H	4%	1.22
			Faucet aerator (Gas DHW)	53%	40%	15%	9	219	M	3%	0.50
			Low Flow Showerhead (w/ Gas DHW)	70%	38%	15%	9	1,824	M	3%	4.04
			Pipe Wrap - gas DHW	70%	0%	1%	15	3,648	M	3%	0.64
			Shower controls	70%	0%	10%	10	1,431	M	3%	0.85
			Water heater tank wrap - Gas	7%	0%	1%	10	365	M	3%	1.17
		Wx	Weatherization/direct install (High gas usage)	18%	80%	10%	40	3,463	O	2%	1.06
			Weatherization/direct install (Low gas usage)	18%	90%	5%	40	1,154	O	2%	1.03
			Weatherization/direct install (Medium gas usage)	35%	85%	8%	40	4,617	O	2%	1.04
	ROB	Space Heating	Cold Climate Heat Pump	15%	0%	100%	20	113	O	5%	0.11
			Dual Fuel Heat Pump	15%	0%	40%	18	123	O	5%	0.32
			Efficient Steam Boiler (MF) - gas	10%	10%	2%	25	63	M	6%	0.24
			Ground Source Heat Pump	15%	0%	100%	20	113	O	5%	0.28
			High Efficiency Boiler w/ indirect DHW	40%	10%	15%	20	301	M	6%	0.77
			High Efficiency Furnace - Natural Gas	15%	40%	12%	20	113	O	1%	1.63
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	51%	5%	45%	11	24	O	10%	2.66
			Energy Star Clothes Washer (w/ Gas WH & Gas D	9%	5%	35%	11	9	O	10%	1.99
			Energy Star Dishwasher (w/Gas DHW)	35%	17%	67%	11	22	L	2%	3.31
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	3%	28%	15	280	O	10%	0.63
			Heat pump water heater replacement for gas water	70%	0%	100%	20	219	O	1%	0.59
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	3%	7%	13	317	O	10%	0.29
			High Efficiency Water Heater - Natural Gas (EF=0.	70%	3%	14%	13	317	O	10%	0.54
			Indirect-fired domestic water heater - NG boiler w/	50%	3%	28%	20	156	M	6%	2.81
			Whole-House Tankless Water Heater (Gas or LP)	70%	0%	30%	20	219	O	5%	0.50
		Home Appliance	Modulating Gas Dryer	10%	0%	20%	11	7	H	13%	0.22

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
MH	Retrofit	Space Heating	Energy Efficient Windows	80%	28%	4%	30	4,934	L	1%	0.14
			HVAC Tune-Up (Gas Heat)	90%	62%	1%	5	5,550	M	5%	0.18
			Programmable Thermostats - gas furnace	90%	35%	3%	10	5,550	L	1%	1.73
			Shell upgrades during remodeling	80%	25%	10%	40	4,934	L	1%	0.78
			Storm Windows	0%	85%	5%	20	-	O	1%	0.93
			Duct Sealing (Outside Conditioned Space)- gas	90%	10%	15%	15	5,550	L	1%	3.60
		Water Heating	Faucet aerator (Gas DHW)	30%	40%	15%	9	50	M	5%	0.75
			Hot Water Demand Recirculation	40%	0%	5%	15	793	H	8%	0.24
			Low Flow Showerhead (w/ Gas DHW)	40%	51%	15%	9	398	M	5%	4.53
			Pipe Wrap - gas DHW	40%	42%	1%	15	793	M	5%	0.46
			Shower controls	40%	0%	10%	10	247	M	5%	0.95
			Water heater tank wrap - Gas	16%	0%	1%	10	317	M	5%	0.29
		Wx	Weatherization/direct install (High gas usage)	20%	25%	20%	40	2,203	O	2%	1.08
			Weatherization/direct install (Low gas usage)	20%	35%	10%	40	793	O	2%	1.03
			Weatherization/direct install (Medium gas usage)	40%	60%	15%	40	2,467	O	2%	1.04
	ROB	Space Heating	Cold Climate Heat Pump	90%	0%	100%	20	333	O	10%	0.20
			Dual Fuel Heat Pump	90%	1%	40%	18	364	O	10%	0.54
			Ground Source Heat Pump	90%	1%	100%	20	333	O	10%	0.49
			High Efficiency Furnace - Natural Gas	90%	10%	12%	20	333	O	1%	1.88
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. [	34%	17%	45%	11	10	O	10%	1.35
			Energy Star Clothes Washer (w/ Gas WH & Gas D	30%	17%	35%	11	20	O	10%	1.04
			Energy Star Dishwasher (w/Gas DHW)	13%	38%	67%	11	2	L	4%	3.31
			Gas-Condensing Water Heater - Natural Gas (EF=	40%	0%	28%	15	61	O	10%	0.90
			Heat pump water heater replacement for gas water	40%	0%	100%	20	48	O	3%	0.77
			High Efficiency Water Heater - Natural Gas (EF=0.	40%	2%	7%	13	69	O	10%	0.43
			High Efficiency Water Heater - Natural Gas (EF=0.	40%	0%	14%	13	69	O	10%	0.77
			Indirect-fired domestic water heater - NG boiler w/	29%	0%	28%	20	34	M	13%	2.29
			Whole-House Tankless Water Heater (Gas or LP)	40%	0%	30%	20	48	O	5%	0.70
		Home Appliance	Modulating Gas Dryer	30%	0%	20%	11	8	H	25%	0.17

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Education	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.24%	50%	40%	10	0.0	H	25%	0.00011	0.86
		DHW	HE Water Heating System Design	0.81%	15%	5%	10	1.1	M	13%	0.00011	1.18
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00005	16.91
			Solar Pool Heater	0.00%	0%	40%	30	0.1	L	4%	0.00011	1.43
		HVAC	Desiccant Dehumidification	13.50%	5%	5%	15	3.7	L	4%	0.00121	0.93
			Economizer	8.00%	75%	20%	15	1.6	M	13%	0.00121	4.90
			Energy Management System	26.50%	50%	10%	15	5.4	M	13%	0.00121	2.20
			High performance integrated design	26.50%	15%	30%	20	5.4	O	28%	0.00121	2.61
			HVAC System Commissioning	26.50%	0%	10%	10	5.4	H	25%	0.00121	2.21
			Shell: Improved Insulation and Air Sealing	21.20%	10%	8%	20	5.4	M	13%	0.00114	3.77
			Shell: Reduced Solar Gain	23.85%	25%	11%	20	5.4	H	25%	0.00114	0.44
		Lighting	Bi-level stairwell lighting	3.06%	5%	50%	10	0.6	H	25%	0.00011	5.28
			CFL Fixture	1.16%	50%	69%	15	0.3	M	13%	0.00011	4.71
			Efficient lighting design/layout	43.00%	30%	20%	10	8.8	O	20%	0.00011	3.15
			Electronic ballast	13.48%	90%	30%	10	2.8	H	25%	0.00011	2.40
			HPT8 Fixture to replace T8	27.37%	10%	11%	10	5.6	O	50%	0.00011	0.66
			LED Exterior Lighting	0.59%	1%	90%	10	0.2	L	4%	0.00011	0.54
			LED Task Lighting	1.16%	2%	35%	10	0.3	O	8%	0.00011	0.27
		Refrig	Economizer for Coolers	0.75%	20%	20%	15	0.2	M	13%	0.00005	3.79
			Evaporative Cooling	1.80%	10%	5%	10	0.4	L	4%	0.00005	3.16
			Floating Head Pressure Control	1.80%	16%	7%	10	0.4	M	13%	0.00005	2.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Education	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.24%	20%	45%	10	4.9	H	8%	0.00011	1.84
			Power Management Software	1.80%	45%	15%	10	49.2	M	5%	0.00011	1.93
		Cooking	HE Ventilation Hoods	0.06%	15%	60%	10	1.5	M	5%	0.00011	0.52
		DHW	DHW Fuel Switching (elec to gas)	1.78%	20%	100%	10	110.7	L	1%	0.00011	4.40
			Faucet Aerators	0.54%	40%	3%	5	11.1	M	5%	0.00011	3.90
			Grey Water Heat Exchanger	3.56%	8%	50%	10	110.7	L	1%	0.00011	1.55
			Heat Trap	3.56%	60%	5%	10	110.7	M	5%	0.00011	0.33
			Insulating Blankets	3.56%	65%	4%	5	110.7	M	5%	0.00011	1.41
			Low Flow Pre-Rinse Nozzles	0.54%	45%	55%	5	11.1	M	5%	0.00011	10.93
			Low Flow Showerhead	0.54%	15%	1%	10	11.1	M	5%	0.00011	2.63
			Pipe Insulation	0.36%	25%	1%	5	11.1	M	5%	0.00011	0.37
			Pool Cover	0.54%	5%	60%	5	12.3	M	5%	0.00011	1.07
			Reduced Temperature Setpoints	3.56%	85%	19%	10	110.7	O	3%	0.00011	4.87
			Timers	3.56%	60%	5%	10	110.7	O	3%	0.00011	0.80
			Ultrasonic Faucet Control	0.49%	25%	3%	10	11.1	M	5%	0.00011	1.05
			Water Heater Cycling	3.56%	60%	5%	10	110.7	O	3%	0.00011	0.80
		HVAC	Chilled Water Free Cooling Controls and Equipments	2.70%	68%	15%	20	61.5	M	5%	0.00121	1.28
			Chilled Water Reset, Optimizer for Chiller(s)	2.70%	25%	5%	10	61.5	M	5%	0.00121	1.76
			Desiccant Dehumidification	9.00%	5%	5%	15	368.9	L	1%	0.00121	0.24
			Energy Management System	19.88%	10%	11%	15	543.1	O	3%	0.00121	0.96
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	30.7	M	5%	0.00000	1.36
			Guest room contls	0.00%	0%	0%	10	18.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	2.70%	60%	15%	23	61.5	H	8%	0.00121	2.30
			HE Motors (VSDs, ECMs, on fans)	18.00%	35%	2%	10	368.9	O	8%	0.00121	3.01
			HE Rooftop AC systems	2.67%	10%	15%	15	60.7	M	5%	0.00121	5.74
			HVAC System maintenance (service buy-down)	26.50%	50%	8%	2	543.1	O	3%	0.00121	3.02
			HVAC System Retrocommissioning	26.50%	0%	15%	10	543.1	O	3%	0.00121	2.79
			Improve Duct Sealing	26.50%	15%	1%	10	543.1	O	3%	0.00121	4.58
			Insulate Pipes/Lines	26.50%	10%	1%	10	543.1	O	3%	0.00121	0.17
			Programmable Thermostat	6.63%	52%	4%	10	543.1	O	3%	0.00121	1.69
			Shell: Insulating and Air Sealing	19.88%	33%	12%	15	543.1	M	5%	0.00114	1.13
			Shell: Reduced Solar Gain	17.49%	25%	11%	15	543.1	H	8%	0.00114	0.11
			Time Clock	26.50%	95%	4%	10	543.1	O	3%	0.00121	1.69
			Ultraviolet A/C Coil Cleaning System	0.57%	25%	4%	20	13.0	M	5%	0.00121	0.73
		Lighting	Advanced Metal Halide	0.86%	15%	30%	10	17.6	O	6%	0.00011	2.44
			Bi-level stairwell lighting	3.06%	5%	50%	10	62.8	M	5%	0.00011	5.28
			CFL Screw in	0.97%	40%	71%	6	26.4	O	5%	0.00011	4.42
			Daylighting controls	0.40%	10%	20%	15	82.0	O	4%	0.00011	0.40
			Electronic ballast	13.48%	90%	30%	10	276.3	O	6%	0.00011	0.66
			Exterior light timers	0.79%	95%	25%	10	16.2	O	8%	0.00011	11.81
			HE Halogen	0.97%	1%	30%	10	26.4	M	5%	0.00011	8.88
			HO T5 lamps	0.65%	20%	45%	10	17.6	O	6%	0.00011	2.26
			HPT8 Fixture to replace T12	14.86%	30%	28%	10	304.6	O	6%	0.00011	1.50
			Induction	0.71%	1%	10%	10	16.2	O	6%	0.00011	2.18

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Education	Retrofit	Lighting	LED Exit Lights	0.19%	60%	75%	10	4.0	H	8%	0.00011	1.11
			LED Exterior Lighting	0.59%	1%	90%	10	16.2	M	5%	0.00011	0.41
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00011	0.36
			Occupancy Sensor	40.85%	22%	23%	10	837.2	O	8%	0.00011	7.84
			Scheduled interior lighting	40.85%	50%	10%	10	837.2	M	5%	0.00011	7.54
			Upgrade Ellipsoidal Reflector Lamps	0.01%	40%	30%	10	0.3	O	6%	0.00011	1.99
		Plug load	HE Battery Charging Station	0.04%	10%	35%	10	0.8	M	5%	0.00011	1.82
			Plug Load Sensors	0.12%	70%	20%	10	2.5	M	5%	0.00011	2.34
			TOD Pool Pump Timer	0.60%	5%	10%	5	12.3	M	5%	0.00011	3.32
			Vendor Miser	0.01%	75%	46%	10	0.2	M	5%	0.00011	2.21
		Refrig	Air Curtain Technologies	0.90%	10%	4%	10	20.5	L	1%	0.00005	1.93
			Ambient Sub-Cooling - oversized condenser	1.80%	10%	5%	10	41.0	O	1%	0.00005	0.67
			Condensate Evaporator	1.80%	10%	5%	10	41.0	L	1%	0.00005	2.36
			Cooler/Freezer Door Auto Closers	0.15%	25%	4%	5	20.5	H	8%	0.00005	2.65
			Cooler/Freezer Door Gaskets	0.40%	25%	2%	5	20.5	H	8%	0.00005	2.65
			Cycle fan off with thermostat; duty cycle occasionally when off	0.60%	25%	5%	5	41.0	M	5%	0.00005	5.65
			Defrost Control System	1.80%	55%	3%	10	41.0	L	1%	0.00005	1.53
			Economizer for Coolers	0.75%	20%	20%	15	20.5	L	1%	0.00005	3.79
			Evaporative Cooling	1.80%	10%	5%	10	41.0	L	1%	0.00005	2.36
			Evaporator Fan Controller	0.04%	10%	30%	10	0.8	L	1%	0.00005	9.01
			Floating Head Pressure Control	1.80%	8%	7%	10	41.0	M	5%	0.00005	3.16
			HE Compressors	1.80%	12%	8%	15	41.0	O	3%	0.00005	1.12
			Insulated Suction Lines	1.80%	10%	1%	10	41.0	L	1%	0.00005	0.52
			Liquid Pressure Amplifiers	1.80%	100%	5%	10	41.0	O	1%	0.00005	2.43
			Mechanical Subcooling - additional subcooled compressor, valve,	1.80%	100%	5%	10	41.0	L	1%	0.00005	1.88
			Parallel Rack Systems	1.80%	100%	5%	10	41.0	L	1%	0.00005	2.36
			Refrigeration E-Cube	1.80%	5%	2%	10	41.0	O	7%	0.00005	0.92
			Refrigeration System Maintenance	1.80%	8%	5%	10	41.0	O	7%	0.00005	2.36
			Strip Curtains	0.20%	22%	4%	5	20.5	O	10%	0.00005	2.65
			VSD on Refrigeration Circulating Pump	0.03%	10%	30%	10	0.8	H	8%	0.00005	0.60
			VSD on Refrigeration Fan	0.03%	10%	30%	10	0.8	H	8%	0.00005	1.17
		Refrig - Display	Anti-sweat heater controls	0.00%	20%	5%	10	0.0	O	10%	0.00005	2.24
			Case Lights-off timer (12am and 6am)	0.00%	25%	25%	2	0.0	M	5%	0.00005	14.00
			New case doors	0.00%	6%	20%	12	0.0	O	10%	0.00005	2.65
			Night Covers for Display Cases	0.00%	20%	6%	5	0.0	H	8%	0.00005	0.93
			Refrigerated Case Doors - Door Misers	0.00%	0%	10%	5	0.0	H	8%	0.00005	2.65
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.00%	31%	3%	12	0.0	O	10%	0.00005	8.33

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Education	ROB	Comp./Data Ctr.	HE (ES) Computers	2.40%	75%	25%	10	7.5	M	13%	0.00011	1.64
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.1	L	4%	0.00011	2.62
			HE (ES) Fryers	0.03%	25%	15%	10	0.1	L	4%	0.00011	0.86
			HE (ES) Hot Food Holding Cabinets	0.05%	25%	60%	10	0.1	L	4%	0.00011	3.07
			HE (ES) Steam Cookers / Steamers	0.03%	25%	50%	10	0.1	L	4%	0.00011	2.62
			HE Broilers	0.03%	40%	18%	10	0.1	L	4%	0.00011	1.02
			HE Griddles	0.03%	40%	32%	10	0.1	L	4%	0.00011	1.75
			HE Induction Cooking	0.02%	25%	20%	10	0.1	L	4%	0.00011	1.13
			HE Ovens	0.03%	30%	2%	10	0.1	L	4%	0.00011	0.07
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00011	0.26
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.04%	5%	65%	10	0.1	L	4%	0.00011	2.10
			HE Clothes Washers	1.62%	20%	5%	10	3.7	M	13%	0.00011	3.29
			HE Dishwashers	1.62%	20%	25%	10	3.7	M	13%	0.00011	1.31
			HE Water Heaters	3.56%	18%	5%	10	12.2	M	13%	0.00011	0.91
			Heat Pump Water Heating	3.56%	5%	59%	10	12.2	M	13%	0.00011	1.24
		HVAC	HE Chillers (air and water cooled)	2.70%	33%	25%	23	3.3	H	25%	0.00121	1.66
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	1.2	M	13%	0.00000	2.88
				0.60%	5%	36%	21	0.9	O	25%	0.00121	0.50
			HE Packaged AC (non rooftop)	2.84%	25%	16%	15	6.0	O	25%	0.00121	3.88
			HE Rooftop AC systems	2.84%	10%	25%	15	6.0	O	25%	0.00121	4.09
			PTAC and PTHP	0.79%	15%	30%	15	1.4	O	25%	0.00121	0.78
		Lighting	CFL Screw in	0.97%	40%	71%	6	13.5	M	13%	0.00011	4.42
			HPT8 Fixture to replace T8	27.37%	5%	11%	10	61.7	O	6%	0.00011	0.38
			LED Refrigerated Case Door Lighting	0.09%	0%	25%	20	0.2	H	25%	0.00011	2.45
			LED Task Lighting	1.16%	2%	35%	20	2.9	M	13%	0.00011	0.32
		Plug load	HE (ES) Icemakers	0.20%	25%	25%	10	0.5	M	13%	0.00011	1.13
			HE (ES) Other Office Equipment	0.80%	25%	25%	10	1.8	M	13%	0.00011	0.69
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00011	1.13
			HE (ES) Water Cooler	0.04%	25%	15%	10	0.1	M	13%	0.00011	0.42
			HE Commercial Clothes Dryers	0.08%	20%	10%	10	0.2	M	13%	0.00011	0.91
			HE Commercial Clothes Washers	0.08%	20%	35%	10	0.2	M	13%	0.00011	2.83
			Low Pressure Drop Pool Filter	0.54%	5%	5%	1	12.4	M	13%	0.00011	0.50
		Refrig	ECM Motors on fans	1.80%	51%	7%	15	3.1	O	7%	0.00005	3.08
			Evaporative Cooling	1.80%	10%	5%	10	4.5	L	4%	0.00005	2.36
			HE Compressors	1.80%	12%	8%	15	3.1	O	20%	0.00005	6.50
			PSC Motors on fans	1.80%	31%	4%	15	3.1	O	7%	0.00005	1.98

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Sales	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.02%	50%	40%	10	0.0	H	25%	0.00014	1.67
		DHW	HE Water Heating System Design	1.35%	15%	5%	10	1.2	M	13%	0.00015	1.20
			Heat Recovery for Hot Water Use	6.75%	28%	40%	15	1.2	H	25%	0.00015	37.16
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00015	2.88
		HVAC	Desiccant Dehumidification	4.50%	5%	5%	15	0.8	L	4%	0.00105	0.89
			Economizer	5.00%	75%	20%	15	0.7	M	13%	0.00105	4.69
			Energy Management System	11.50%	50%	10%	15	1.6	M	13%	0.00105	0.67
			High performance integrated design	11.50%	15%	30%	20	1.6	O	28%	0.00105	1.10
			HVAC System Commissioning	11.50%	0%	10%	10	1.6	H	25%	0.00105	1.27
			Shell: Improved Insulation and Air Sealing	9.20%	10%	8%	20	1.6	M	13%	0.00099	7.86
			Shell: Reduced Solar Gain	10.35%	25%	3%	20	1.6	H	25%	0.00099	0.93
		Lighting	Bi-level stairwell lighting	1.33%	5%	50%	10	0.2	M	13%	0.00014	5.36
			CFL Fixture	0.38%	50%	69%	15	0.1	M	13%	0.00014	4.79
			Efficient lighting design/layout	21.00%	30%	20%	10	2.9	O	20%	0.00014	3.20
			Electronic ballast	9.47%	90%	30%	10	1.3	M	13%	0.00014	2.44
			HPT8 Fixture to replace T8	11.11%	10%	11%	10	1.5	O	50%	0.00014	0.67
			LED Exterior Lighting	0.59%	1%	90%	10	0.1	L	4%	0.00014	0.55
			LED Task Lighting	0.38%	2%	35%	10	0.1	O	8%	0.00014	0.27
		Refrig	Economizer for Coolers	16.88%	20%	20%	15	3.1	H	25%	0.00015	3.94
			Evaporative Cooling	40.50%	10%	5%	10	6.1	L	4%	0.00015	6.04
			Floating Head Pressure Control	40.50%	16%	7%	10	6.1	H	25%	0.00015	4.69

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Sales	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.02%	20%	45%	10	0.3	H	8%	0.00014	3.44
			Power Management Software	0.08%	45%	15%	10	1.4	M	5%	0.00014	3.54
		Cooking	HE Ventilation Hoods	0.07%	15%	60%	10	1.2	M	5%	0.00014	1.13
		DHW	DHW Fuel Switching (elec to gas)	2.97%	20%	100%	10	123.0	L	1%	0.00015	6.55
			Faucet Aerators	0.90%	40%	1%	5	12.3	M	5%	0.00015	7.34
			Grey Water Heat Exchanger	5.94%	8%	50%	10	123.0	L	1%	0.00015	3.22
			Heat Trap	5.94%	60%	5%	10	123.0	M	5%	0.00015	0.73
			Insulating Blankets	5.94%	65%	4%	5	123.0	M	5%	0.00015	2.98
			Low Flow Pre-Rinse Nozzles	0.90%	45%	5%	5	12.3	M	5%	0.00015	15.70
			Low Flow Showerhead	0.90%	15%	1%	10	12.3	M	5%	0.00015	5.16
			Pipe Insulation	0.59%	25%	1%	5	12.3	M	5%	0.00015	0.82
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00015	2.30
			Reduced Temperature Setpoints	5.94%	50%	19%	10	123.0	O	3%	0.00015	8.56
			Timers	5.94%	60%	5%	10	123.0	O	3%	0.00015	1.74
			Ultrasonic Faucet Control	0.81%	5%	3%	10	12.3	M	5%	0.00015	2.24
			Water Heater Cycling	5.94%	60%	5%	10	123.0	O	3%	0.00015	1.74
		HVAC	Chilled Water Free Cooling Controls and Equipments	1.80%	68%	15%	20	27.3	M	5%	0.00105	1.22
			Chilled Water Reset, Optimizer for Chiller(s)	1.80%	25%	5%	10	27.3	M	5%	0.00105	1.69
			Desiccant Dehumidification	3.00%	5%	5%	15	82.0	L	1%	0.00105	0.23
			Energy Management System	8.63%	10%	11%	15	157.1	O	3%	0.00105	0.41
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	20.5	M	5%	0.00000	1.36
			Guest room contls	0.00%	0%	0%	10	7.5	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	1.80%	60%	15%	23	27.3	H	8%	0.00105	2.21
			HE Motors (VSDs, ECMs, on fans)	6.00%	35%	2%	10	82.0	O	8%	0.00105	2.88
			HE Rooftop AC systems	1.60%	10%	15%	15	24.3	M	5%	0.00105	9.60
			HVAC System maintenance (service buy-down)	11.50%	20%	8%	2	157.1	O	3%	0.00105	1.29
			HVAC System Retrocommissioning	11.50%	0%	15%	10	157.1	O	3%	0.00105	1.70
			Improve Duct Sealing	11.50%	15%	1%	10	157.1	O	3%	0.00105	2.94
			Insulate Pipes/Lines	11.50%	10%	1%	10	157.1	O	3%	0.00105	0.16
			Programmable Thermostat	2.88%	52%	4%	10	157.1	O	3%	0.00105	0.72
			Shell: Insulating and Air Sealing	8.63%	33%	12%	15	157.1	L	1%	0.00099	2.44
			Shell: Reduced Solar Gain	7.59%	25%	3%	15	157.1	M	5%	0.00099	0.23
			Time Clock	11.50%	95%	4%	10	157.1	O	3%	0.00105	0.72
			Ultraviolet A/C Coil Cleaning System	0.36%	25%	4%	20	5.4	M	5%	0.00105	0.70
		Lighting	Advanced Metal Halide	2.00%	15%	30%	10	27.3	O	6%	0.00014	2.47
			Bi-level stairwell lighting	1.33%	5%	50%	10	21.1	M	5%	0.00014	5.36
			CFL Screw in	0.32%	40%	71%	6	5.7	O	5%	0.00014	4.49
			Daylighting controls	0.40%	10%	20%	15	54.7	O	4%	0.00014	0.41
			Electronic ballast	9.47%	90%	30%	10	129.3	O	6%	0.00014	0.67
			Exterior light timers	0.79%	90%	25%	10	10.8	O	8%	0.00014	11.96
			HE Halogen	0.32%	1%	30%	10	5.7	M	5%	0.00014	9.01
			HO T5 lamps	0.00%	30%	45%	10	0.0	O	6%	0.00014	2.30
			HPT8 Fixture to replace T12	10.44%	5%	28%	10	142.6	O	6%	0.00014	1.52
			Induction	0.71%	5%	10%	10	10.8	O	6%	0.00014	2.21

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Sales	Retrofit	Lighting	LED Exit Lights	0.06%	60%	75%	10	0.9	H	8%	0.00014	1.13
			LED Exterior Lighting	0.59%	1%	90%	10	10.8	M	5%	0.00014	0.42
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00014	0.29
			Occupancy Sensor	20.58%	22%	2%	10	281.2	O	8%	0.00014	2.96
			Scheduled interior lighting	20.58%	50%	10%	11	281.2	L	1%	0.00014	7.90
			Upgrade Ellipsoidal Reflector Lamps	0.00%	60%	30%	10	0.1	O	6%	0.00014	2.02
		Plug load	HE Battery Charging Station	0.01%	10%	35%	10	0.1	M	5%	0.00014	3.35
			Plug Load Sensors	0.01%	70%	20%	10	0.1	L	1%	0.00014	4.20
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00015	6.41
			Vendor Miser	0.01%	30%	46%	10	0.2	M	5%	0.00014	2.24
		Refrig	Air Curtain Technologies	20.25%	10%	4%	10	307.4	L	1%	0.00015	3.93
			Ambient Sub-Cooling - oversized condenser	40.50%	10%	5%	10	614.8	O	1%	0.00015	1.45
			Condensate Evaporator	40.50%	10%	5%	10	614.8	L	1%	0.00015	4.69
			Cooler/Freezer Door Auto Closers	3.38%	25%	4%	5	307.4	H	8%	0.00015	5.26
			Cooler/Freezer Door Gaskets	9.00%	25%	2%	5	307.4	H	8%	0.00015	4.23
			Cycle fan off with thermostat; duty cycle occasionally when off	13.50%	25%	5%	5	614.8	H	8%	0.00015	9.90
			Defrost Control System	40.50%	55%	3%	10	614.8	M	5%	0.00015	3.17
			Economizer for Coolers	16.88%	20%	20%	15	307.4	M	5%	0.00015	6.90
			Evaporative Cooling	40.50%	10%	5%	10	614.8	L	1%	0.00015	4.69
			Evaporator Fan Controller	0.81%	10%	30%	10	12.3	M	5%	0.00015	13.44
			Floating Head Pressure Control	40.50%	8%	7%	10	614.8	H	8%	0.00015	6.04
			HE Compressors	40.50%	12%	8%	15	614.8	O	3%	0.00015	2.36
			Insulated Suction Lines	40.50%	10%	1%	10	614.8	L	1%	0.00015	1.14
			Liquid Pressure Amplifiers	40.50%	95%	5%	10	614.8	O	1%	0.00015	4.81
			Mechanical Subcooling - additional subcooled compressor, valve,	40.50%	95%	5%	10	614.8	L	1%	0.00015	3.82
			Parallel Rack Systems	40.50%	95%	5%	10	614.8	L	1%	0.00015	4.69
			Refrigeration E-Cube	40.50%	5%	2%	10	614.8	O	7%	0.00015	1.96
			Refrigeration System Maintenance	40.50%	8%	5%	10	614.8	O	7%	0.00015	4.69
			Strip Curtains	4.50%	22%	4%	5	307.4	O	10%	0.00015	5.26
			VSD on Refrigeration Circulating Pump	0.68%	10%	30%	10	12.3	H	8%	0.00015	1.31
			VSD on Refrigeration Fan	0.68%	10%	30%	10	12.3	H	8%	0.00015	2.47
		Refrig - Display	Anti-sweat heater controls	4.46%	20%	5%	10	202.9	O	10%	0.00015	4.48
			Case Lights-off timer (12am and 6am)	4.46%	25%	25%	2	202.9	H	8%	0.00015	19.01
			New case doors	4.46%	8%	20%	12	202.9	O	10%	0.00015	5.16
			Night Covers for Display Cases	4.46%	20%	6%	5	202.9	H	8%	0.00015	1.99
			Refrigerated Case Doors - Door Misers	4.46%	0%	10%	5	202.9	H	8%	0.00015	5.26
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	4.46%	31%	3%	12	202.9	O	10%	0.00015	12.57

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Sales	ROB	Comp./Data Ctr.	HE (ES) Computers	0.10%	75%	25%	10	0.2	M	13%	0.00014	3.05
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.0	L	4%	0.00000	0.00
			HE (ES) Fryers	0.03%	25%	15%	10	0.0	L	4%	0.00014	1.82
			HE (ES) Hot Food Holding Cabinets	0.06%	25%	60%	10	0.1	L	4%	0.00014	5.86
			HE (ES) Steam Cookers / Steamers	0.03%	25%	50%	10	0.0	L	4%	0.00000	0.00
			HE Broilers	0.03%	40%	18%	10	0.0	L	4%	0.00014	2.15
			HE Griddles	0.03%	40%	32%	10	0.0	L	4%	0.00014	3.56
			HE Induction Cooking	0.03%	25%	20%	10	0.0	L	4%	0.00000	0.00
			HE Ovens	0.03%	20%	2%	10	0.0	L	4%	0.00014	0.16
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00014	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.05%	5%	65%	10	0.1	L	4%	0.00014	4.19
			HE Clothes Washers	0.45%	20%	7%	10	0.7	M	13%	0.00015	3.34
			HE Dishwashers	0.45%	20%	3%	10	0.7	M	13%	0.00015	1.33
			HE Water Heaters	5.94%	18%	5%	10	13.5	M	13%	0.00015	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	8.1	M	13%	0.00015	2.62
		HVAC	HE Chillers (air and water cooled)	1.80%	33%	25%	23	1.5	H	25%	0.00105	1.59
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	0.8	M	13%	0.00000	2.88
				0.38%	5%	36%	21	0.4	O	25%	0.00105	0.48
			HE Packaged AC (non rooftop)	1.78%	25%	16%	15	2.5	O	25%	0.00105	3.71
			HE Rooftop AC systems	1.78%	10%	25%	15	2.5	O	25%	0.00105	7.27
			PTAC and PTHP	0.50%	15%	30%	15	0.6	O	25%	0.00000	0.00
		Lighting	CFL Screw in	0.32%	40%	71%	6	2.9	M	13%	0.00014	4.49
			HPT8 Fixture to replace T8	11.11%	10%	11%	10	16.7	O	6%	0.00014	0.39
			LED Refrigerated Case Door Lighting	0.90%	20%	25%	20	1.5	H	25%	0.00014	2.49
			LED Task Lighting	0.38%	2%	35%	20	0.6	M	13%	0.00014	0.32
		Plug load	HE (ES) Icemakers	0.75%	25%	25%	10	1.1	L	4%	0.00014	0.70
			HE (ES) Other Office Equipment	0.10%	25%	25%	10	0.2	M	13%	0.00014	1.36
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00014	1.14
			HE (ES) Water Cooler	0.01%	25%	15%	10	0.0	M	13%	0.00014	0.43
			HE Commercial Clothes Dryers	0.02%	20%	10%	10	0.0	M	13%	0.00000	0.00
			HE Commercial Clothes Washers	0.02%	43%	35%	10	0.0	M	13%	0.00000	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00015	1.11
		Refrig	ECM Motors on fans	40.50%	51%	7%	15	47.1	O	7%	0.00015	5.82
			Evaporative Cooling	40.50%	10%	5%	10	67.6	L	4%	0.00015	4.69
			HE Compressors	40.50%	12%	8%	15	47.1	O	20%	0.00015	10.38
			PSC Motors on fans	40.50%	31%	4%	15	47.1	O	7%	0.00015	3.97

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Servic	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.02%	50%	40%	10	0.0	H	25%	0.00014	1.82
		DHW	HE Water Heating System Design	2.10%	15%	5%	10	1.9	M	13%	0.00011	1.18
			Heat Recovery for Hot Water Use	10.50%	28%	40%	15	1.9	M	13%	0.00005	33.78
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00011	2.60
		HVAC	Desiccant Dehumidification	5.25%	5%	5%	15	1.0	L	4%	0.00086	1.64
			Economizer	8.00%	75%	20%	15	1.1	M	13%	0.00086	7.55
			Energy Management System	15.50%	50%	10%	15	2.1	M	13%	0.00086	4.33
			High performance integrated design	15.50%	15%	30%	20	2.1	O	28%	0.00086	4.95
			HVAC System Commissioning	15.50%	0%	10%	10	2.1	H	25%	0.00086	4.09
			Shell: Improved Insulation and Air Sealing	12.40%	10%	8%	20	2.1	M	13%	0.00080	7.10
			Shell: Reduced Solar Gain	13.95%	25%	10%	20	2.1	H	25%	0.00080	0.79
		Lighting	Bi-level stairwell lighting	1.02%	5%	50%	10	0.2	M	13%	0.00014	8.30
			CFL Fixture	3.24%	50%	69%	15	0.5	M	13%	0.00014	7.42
			Efficient lighting design/layout	20.00%	30%	20%	10	2.7	O	20%	0.00014	5.46
			Electronic ballast	7.54%	90%	30%	10	1.0	M	13%	0.00014	4.32
			HPT8 Fixture to replace T8	8.86%	10%	11%	10	1.2	O	50%	0.00014	1.29
			LED Exterior Lighting	0.89%	1%	90%	10	0.2	L	4%	0.00014	1.08
			LED Task Lighting	3.24%	2%	35%	10	0.5	O	8%	0.00014	0.54
		Refrig	Economizer for Coolers	12.00%	20%	20%	15	2.2	M	13%	0.00000	0.00
			Evaporative Cooling	28.80%	10%	5%	10	4.4	L	4%	0.00005	5.43
			Floating Head Pressure Control	28.80%	16%	7%	10	4.4	M	13%	0.00005	4.20

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Servic	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.02%	20%	45%	10	0.3	H	8%	0.00014	3.72
			Power Management Software	0.08%	45%	15%	10	1.4	M	5%	0.00014	3.81
		Cooking	HE Ventilation Hoods	0.29%	15%	60%	10	5.3	M	5%	0.00014	1.03
		DHW	DHW Fuel Switching (elec to gas)	4.62%	20%	100%	10	191.3	L	1%	0.00011	6.09
			Faucet Aerators	1.40%	40%	1%	5	19.1	M	5%	0.00011	6.69
			Grey Water Heat Exchanger	9.24%	8%	25%	10	191.3	L	1%	0.00011	2.88
			Heat Trap	9.24%	60%	5%	10	191.3	M	5%	0.00011	0.65
			Insulating Blankets	9.24%	65%	4%	5	191.3	M	5%	0.00011	2.66
			Low Flow Pre-Rinse Nozzles	1.40%	45%	55%	5	19.1	M	5%	0.00011	14.88
			Low Flow Showerhead	1.40%	15%	1%	10	19.1	M	5%	0.00011	4.67
			Pipe Insulation	0.92%	25%	1%	5	19.1	M	5%	0.00011	0.73
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00011	2.05
			Reduced Temperature Setpoints	9.24%	50%	19%	10	191.3	O	3%	0.00011	7.88
			Timers	9.24%	60%	5%	10	191.3	O	3%	0.00011	1.55
			Ultrasonic Faucet Control	1.26%	25%	3%	10	19.1	M	5%	0.00011	2.00
			Water Heater Cycling	9.24%	60%	5%	10	191.3	O	3%	0.00011	1.55
		HVAC	Chilled Water Free Cooling Controls and Equipments	2.70%	68%	15%	20	41.0	M	5%	0.00086	2.22
			Chilled Water Reset, Optimizer for Chiller(s)	2.70%	25%	5%	10	41.0	M	5%	0.00086	3.05
			Desiccant Dehumidification	3.50%	5%	5%	15	95.6	L	1%	0.00086	0.43
			Energy Management System	11.63%	10%	11%	15	211.8	O	3%	0.00086	1.85
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	20.5	M	5%	0.00000	2.30
			Guest room contls	0.00%	0%	0%	10	12.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	2.70%	60%	15%	23	41.0	H	8%	0.00086	3.82
			HE Motors (VSDs, ECMs, on fans)	7.00%	35%	2%	10	95.6	O	8%	0.00086	4.99
			HE Rooftop AC systems	2.67%	10%	15%	15	40.5	M	5%	0.00086	8.56
			HVAC System maintenance (service buy-down)	15.50%	20%	8%	2	211.8	O	3%	0.00086	5.76
			HVAC System Retrocommissioning	15.50%	0%	15%	10	211.8	O	3%	0.00086	5.08
			Improve Duct Sealing	15.50%	15%	1%	10	211.8	O	3%	0.00086	8.01
			Insulate Pipes/Lines	15.50%	20%	1%	10	211.8	O	3%	0.00086	0.30
			Programmable Thermostat	3.88%	52%	4%	10	211.8	O	3%	0.00086	3.24
			Shell: Insulating and Air Sealing	11.63%	33%	12%	15	211.8	L	1%	0.00080	2.19
			Shell: Reduced Solar Gain	10.23%	25%	10%	15	211.8	M	5%	0.00080	0.19
			Time Clock	15.50%	95%	4%	10	211.8	O	3%	0.00086	3.24
			Ultraviolet A/C Coil Cleaning System	0.57%	25%	4%	20	8.6	M	5%	0.00086	1.29
		Lighting	Advanced Metal Halide	0.00%	15%	30%	10	0.0	O	6%	0.00014	4.38
			Bi-level stairwell lighting	1.02%	5%	50%	10	16.8	M	5%	0.00014	8.30
			CFL Screw in	2.70%	40%	71%	6	49.2	O	5%	0.00014	7.36
			Daylighting controls	0.60%	10%	20%	15	82.0	O	4%	0.00014	0.80
			Electronic ballast	7.54%	90%	30%	10	103.1	O	6%	0.00014	1.30
			Exterior light timers	1.19%	90%	10%	10	16.2	O	8%	0.00014	15.60
			HE Halogen	2.70%	1%	30%	10	49.2	M	5%	0.00014	12.06
			HO T5 lamps	0.00%	30%	45%	10	0.0	O	6%	0.00014	4.10
			HPT8 Fixture to replace T12	8.32%	5%	28%	10	113.6	O	6%	0.00014	1.52
			Induction	1.07%	5%	10%	10	16.2	O	6%	0.00014	4.04

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Servic	Retrofit	Lighting	LED Exit Lights	0.18%	60%	75%	10	2.5	H	8%	0.00014	2.14
			LED Exterior Lighting	0.89%	1%	90%	10	16.2	M	5%	0.00014	0.83
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00014	0.58
			Occupancy Sensor	18.60%	22%	2%	10	254.1	O	8%	0.00014	5.12
			Scheduled interior lighting	18.60%	50%	10%	12	254.1	L	1%	0.00014	11.07
			Upgrade Ellipsoidal Reflector Lamps	0.03%	60%	30%	10	0.5	O	6%	0.00014	3.65
		Plug load	HE Battery Charging Station	0.01%	10%	35%	10	0.1	M	5%	0.00014	3.61
			Plug Load Sensors	0.01%	70%	20%	10	0.1	L	1%	0.00014	4.51
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00011	5.82
			Vendor Miser	0.05%	30%	46%	10	0.7	M	5%	0.00014	2.24
		Refrig	Air Curtain Technologies	14.40%	10%	4%	10	218.6	L	1%	0.00005	3.50
			Ambient Sub-Cooling - oversized condenser	28.80%	10%	5%	10	437.2	O	1%	0.00005	1.28
			Condensate Evaporator	28.80%	10%	5%	10	437.2	L	1%	0.00005	4.20
			Cooler/Freezer Door Auto Closers	2.40%	25%	4%	5	218.6	H	8%	0.00005	4.71
			Cooler/Freezer Door Gaskets	6.40%	25%	2%	5	218.6	H	8%	0.00005	3.75
			Cycle fan off with thermostat; duty cycle occasionally when off	9.60%	25%	5%	5	437.2	M	5%	0.00005	9.02
			Defrost Control System	28.80%	55%	3%	10	437.2	L	1%	0.00005	2.82
			Economizer for Coolers	12.00%	20%	20%	15	218.6	L	1%	0.00005	6.25
			Evaporative Cooling	28.80%	10%	5%	10	437.2	L	1%	0.00005	4.20
			Evaporator Fan Controller	0.58%	10%	30%	10	8.7	L	1%	0.00005	12.49
			Floating Head Pressure Control	28.80%	8%	7%	10	437.2	M	5%	0.00005	5.43
			HE Compressors	28.80%	12%	8%	15	437.2	O	3%	0.00005	2.09
			Insulated Suction Lines	28.80%	10%	1%	10	437.2	L	1%	0.00005	1.00
			Liquid Pressure Amplifiers	28.80%	100%	5%	10	437.2	O	1%	0.00005	4.31
			Mechanical Subcooling - additional subcooled compressor, valve,	28.80%	100%	5%	10	437.2	L	1%	0.00005	3.41
			Parallel Rack Systems	28.80%	100%	5%	10	437.2	L	1%	0.00005	4.20
			Refrigeration E-Cube	28.80%	5%	2%	10	437.2	O	7%	0.00005	1.74
			Refrigeration System Maintenance	28.80%	8%	5%	10	437.2	O	7%	0.00005	4.20
			Strip Curtains	3.20%	22%	4%	5	218.6	O	10%	0.00005	4.71
			VSD on Refrigeration Circulating Pump	0.48%	10%	30%	10	8.7	H	8%	0.00005	1.16
			VSD on Refrigeration Fan	0.48%	10%	30%	10	8.7	H	8%	0.00005	2.19
		Refrig - Display	Anti-sweat heater controls	3.17%	20%	6%	10	144.3	O	10%	0.00005	4.00
			Case Lights-off timer (12am and 6am)	3.17%	25%	25%	2	144.3	M	5%	0.00005	17.85
			New case doors	3.17%	8%	20%	12	144.3	O	10%	0.00005	4.63
			Night Covers for Display Cases	3.17%	20%	6%	5	144.3	H	8%	0.00005	1.76
			Refrigerated Case Doors - Door Misers	3.17%	0%	10%	5	144.3	H	8%	0.00005	4.71
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	3.17%	31%	3%	12	144.3	O	10%	0.00005	11.66

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Food Servic	ROB	Comp./Data Ctr.	HE (ES) Computers	0.10%	75%	25%	10	0.2	M	13%	0.00014	3.29
		Cooking	Connectionless (Boilerless) Steamers	0.10%	25%	50%	10	0.2	L	4%	0.00014	4.73
			HE (ES) Fryers	0.13%	25%	15%	10	0.2	L	4%	0.00014	1.67
			HE (ES) Hot Food Holding Cabinets	0.26%	25%	60%	10	0.4	L	4%	0.00014	5.45
			HE (ES) Steam Cookers / Steamers	0.13%	25%	50%	10	0.2	L	4%	0.00014	4.73
			HE Broilers	0.13%	25%	18%	10	0.2	L	4%	0.00014	1.97
			HE Griddles	0.13%	25%	32%	10	0.2	L	4%	0.00014	3.28
			HE Induction Cooking	0.12%	25%	20%	10	0.2	L	4%	0.00014	2.17
			HE Ovens	0.13%	12%	2%	10	0.2	L	4%	0.00014	0.14
			Solid State Temperature Controls	0.03%	15%	15%	10	0.0	M	13%	0.00014	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.20%	5%	65%	10	0.4	L	4%	0.00014	3.87
			HE Clothes Washers	4.20%	20%	35%	10	6.3	M	13%	0.00011	3.29
			HE Dishwashers	5.60%	20%	25%	10	8.4	M	13%	0.00011	1.31
			HE Water Heaters	9.24%	18%	5%	10	21.0	M	13%	0.00011	0.91
			Heat Pump Water Heating	3.56%	5%	59%	10	8.1	M	13%	0.00011	2.34
		HVAC	HE Chillers (air and water cooled)	2.70%	33%	25%	23	2.2	H	25%	0.00086	2.83
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	0.8	M	13%	0.00000	4.88
				0.60%	5%	36%	21	0.6	O	25%	0.00086	0.89
			HE Packaged AC (non rooftop)	2.84%	25%	16%	15	4.0	O	25%	0.00086	6.18
			HE Rooftop AC systems	2.84%	10%	25%	15	4.0	O	25%	0.00086	6.42
			PTAC and PTHP	0.79%	15%	30%	15	0.9	O	25%	0.00000	0.00
		Lighting	CFL Screw in	2.70%	40%	71%	6	25.1	M	13%	0.00014	7.36
			HPT8 Fixture to replace T8	8.86%	10%	11%	10	13.3	O	6%	0.00014	0.76
			LED Refrigerated Case Door Lighting	0.09%	0%	25%	20	0.2	H	25%	0.00014	4.28
			LED Task Lighting	3.24%	2%	35%	20	5.4	M	13%	0.00014	0.64
		Plug load	HE (ES) Icemakers	0.75%	25%	25%	10	1.1	L	4%	0.00014	0.70
			HE (ES) Other Office Equipment	0.10%	25%	25%	10	0.2	M	13%	0.00014	1.48
			HE (ES) Refrig. Bev. Vending Machines	0.05%	30%	20%	10	0.1	M	13%	0.00014	1.14
			HE (ES) Water Cooler	0.01%	25%	15%	10	0.0	M	13%	0.00014	0.43
			HE Commercial Clothes Dryers	0.02%	20%	10%	10	0.0	M	13%	0.00014	1.92
			HE Commercial Clothes Washers	0.02%	43%	35%	10	0.0	M	13%	0.00014	5.31
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00011	0.98
		Refrig	ECM Motors on fans	28.80%	51%	7%	15	33.5	O	7%	0.00005	5.24
			Evaporative Cooling	28.80%	10%	5%	10	48.1	L	4%	0.00005	4.20
			HE Compressors	28.80%	12%	8%	15	33.5	O	20%	0.00005	9.57
			PSC Motors on fans	28.80%	31%	4%	15	33.5	O	7%	0.00005	3.55

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Health Care	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.60%	50%	40%	10	0.1	H	25%	0.00014	2.62
		DHW	HE Water Heating System Design	0.81%	15%	5%	10	1.0	M	13%	0.00014	1.20
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00010	55.71
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00014	3.89
		HVAC	Desiccant Dehumidification	6.75%	5%	5%	15	1.6	L	4%	0.00051	2.31
			Economizer	12.00%	75%	20%	15	2.2	L	4%	0.00051	9.25
			Energy Management System	22.00%	50%	10%	15	4.0	M	13%	0.00051	6.97
			High performance integrated design	22.00%	15%	30%	20	4.0	O	28%	0.00051	7.65
			HVAC System Commissioning	22.00%	0%	10%	10	4.0	H	25%	0.00051	6.13
			Shell: Improved Insulation and Air Sealing	17.60%	10%	8%	20	4.0	M	13%	0.00048	10.94
			Shell: Reduced Solar Gain	19.80%	25%	9%	20	4.0	H	25%	0.00048	1.16
		Lighting	Bi-level stairwell lighting	2.39%	30%	50%	10	0.5	M	13%	0.00014	10.52
			CFL Fixture	1.48%	50%	69%	15	0.3	L	4%	0.00014	9.41
			Efficient lighting design/layout	41.00%	30%	20%	10	7.5	O	20%	0.00014	7.50
			Electronic ballast	12.99%	90%	30%	10	2.4	M	13%	0.00014	6.14
			HPT8 Fixture to replace T8	26.37%	10%	11%	10	4.8	O	50%	0.00014	2.02
			LED Exterior Lighting	0.30%	1%	90%	10	0.1	L	4%	0.00014	1.71
			LED Task Lighting	1.48%	2%	35%	10	0.3	O	8%	0.00014	0.86
		Refrig	Economizer for Coolers	1.13%	20%	20%	15	0.3	M	13%	0.00000	0.00
			Evaporative Cooling	2.70%	10%	5%	10	0.5	L	4%	0.00010	7.81
			Floating Head Pressure Control	2.70%	16%	7%	10	0.5	M	13%	0.00010	6.24

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Health Care	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.60%	20%	45%	10	10.9	H	8%	0.00014	5.15
			Power Management Software	5.25%	45%	15%	10	127.5	M	5%	0.00014	5.18
		Cooking	HE Ventilation Hoods	0.07%	15%	60%	10	1.6	M	5%	0.00014	1.65
		DHW	DHW Fuel Switching (elec to gas)	1.78%	20%	100%	10	98.4	L	1%	0.00014	7.38
			Faucet Aerators	0.54%	40%	4%	5	9.8	M	5%	0.00014	9.47
			Grey Water Heat Exchanger	3.56%	8%	30%	10	98.4	L	1%	0.00014	4.45
			Heat Trap	3.56%	60%	5%	10	98.4	M	5%	0.00014	1.07
			Insulating Blankets	3.56%	65%	4%	5	98.4	M	5%	0.00014	4.17
			Low Flow Pre-Rinse Nozzles	0.54%	45%	55%	5	9.8	M	5%	0.00014	17.60
			Low Flow Showerhead	0.54%	15%	1%	10	9.8	M	5%	0.00014	6.85
			Pipe Insulation	0.36%	25%	1%	5	9.8	M	5%	0.00014	1.20
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00014	3.27
			Reduced Temperature Setpoints	3.56%	25%	19%	10	98.4	O	3%	0.00014	10.62
			Timers	3.56%	60%	5%	10	98.4	O	3%	0.00014	2.49
			Ultrasonic Faucet Control	0.49%	10%	3%	10	9.8	M	5%	0.00014	3.17
			Water Heater Cycling	3.56%	60%	5%	10	98.4	O	3%	0.00014	2.49
		HVAC	Chilled Water Free Cooling Controls and Equipments	8.10%	68%	15%	20	164.0	L	1%	0.00051	3.06
			Chilled Water Reset, Optimizer for Chiller(s)	8.10%	25%	5%	10	164.0	L	1%	0.00051	4.17
			Desiccant Dehumidification	4.50%	5%	5%	15	164.0	L	1%	0.00051	0.63
			Energy Management System	16.50%	10%	11%	15	400.8	O	3%	0.00051	2.92
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	27.3	M	5%	0.00000	3.11
			Guest room contls	0.00%	0%	0%	10	24.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	8.10%	60%	15%	23	164.0	M	5%	0.00051	5.01
			HE Motors (VSDs, ECMs, on fans)	9.00%	35%	2%	10	164.0	O	8%	0.00051	6.55
			HE Rooftop AC systems	4.27%	10%	15%	15	86.3	M	5%	0.00051	10.32
			HVAC System maintenance (service buy-down)	22.00%	70%	8%	2	400.8	O	3%	0.00051	8.96
			HVAC System Retrocommissioning	22.00%	0%	15%	10	400.8	O	3%	0.00051	7.46
			Improve Duct Sealing	22.00%	15%	1%	10	400.8	O	3%	0.00051	11.25
			Insulate Pipes/Lines	22.00%	10%	1%	10	400.8	O	3%	0.00051	0.44
			Programmable Thermostat	5.50%	52%	4%	10	400.8	O	3%	0.00051	5.09
			Shell: Insulating and Air Sealing	16.50%	33%	12%	15	400.8	L	1%	0.00048	2.67
			Shell: Reduced Solar Gain	14.52%	25%	9%	15	400.8	M	5%	0.00048	0.29
			Time Clock	22.00%	95%	4%	10	400.8	O	3%	0.00051	5.09
			Ultraviolet A/C Coil Cleaning System	0.85%	25%	4%	20	17.3	M	5%	0.00051	1.83
		Lighting	Advanced Metal Halide	0.00%	15%	30%	10	0.0	O	6%	0.00014	6.21
			Bi-level stairwell lighting	2.39%	30%	50%	10	53.8	M	5%	0.00014	10.52
			CFL Screw in	1.23%	40%	71%	6	29.9	O	5%	0.00014	9.74
			Daylighting controls	0.20%	10%	20%	15	36.4	O	4%	0.00014	1.28
			Electronic ballast	12.99%	90%	30%	10	236.6	O	6%	0.00014	2.04
			Exterior light timers	0.40%	95%	5%	10	7.2	O	8%	0.00014	17.68
			HE Halogen	1.23%	1%	30%	10	29.9	M	5%	0.00014	13.87
			HO T5 lamps	0.00%	30%	45%	10	0.0	O	6%	0.00014	5.86
			HPT8 Fixture to replace T12	14.32%	20%	28%	10	260.9	O	6%	0.00014	1.52
			Induction	0.36%	5%	10%	10	7.2	O	6%	0.00014	5.93

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Health Care	Retrofit	Lighting	LED Exit Lights	0.25%	60%	75%	10	4.5	H	8%	0.00014	3.25
			LED Exterior Lighting	0.30%	1%	90%	10	7.2	M	5%	0.00014	1.32
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00014	0.93
			Occupancy Sensor	39.36%	22%	18%	10	717.0	O	8%	0.00014	7.10
			Scheduled interior lighting	39.36%	50%	5%	13	717.0	L	1%	0.00014	12.86
			Upgrade Ellipsoidal Reflector Lamps	0.01%	40%	30%	10	0.3	O	6%	0.00014	5.29
		Plug load	HE Battery Charging Station	0.10%	10%	35%	10	1.8	M	5%	0.00014	4.93
			Plug Load Sensors	0.10%	70%	20%	10	1.8	L	1%	0.00014	6.02
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00014	8.41
			Vendor Miser	0.01%	30%	46%	10	0.2	M	5%	0.00014	2.24
		Refrig	Air Curtain Technologies	1.35%	10%	4%	10	27.3	L	1%	0.00010	5.30
			Ambient Sub-Cooling - oversized condenser	2.70%	10%	5%	10	54.7	O	1%	0.00010	2.06
			Condensate Evaporator	2.70%	10%	5%	10	54.7	L	1%	0.00010	6.24
			Cooler/Freezer Door Auto Closers	0.23%	25%	4%	5	27.3	H	8%	0.00010	6.99
			Cooler/Freezer Door Gaskets	0.60%	25%	2%	5	27.3	H	8%	0.00010	5.60
			Cycle fan off with thermostat; duty cycle occasionally when off	0.90%	25%	5%	5	54.7	M	5%	0.00010	12.11
			Defrost Control System	2.70%	55%	3%	10	54.7	L	1%	0.00010	4.36
			Economizer for Coolers	1.13%	20%	20%	15	27.3	L	1%	0.00010	8.62
			Evaporative Cooling	2.70%	10%	5%	10	54.7	L	1%	0.00010	6.24
			Evaporator Fan Controller	0.05%	10%	30%	10	1.1	L	1%	0.00010	15.08
			Floating Head Pressure Control	2.70%	8%	7%	10	54.7	M	5%	0.00010	7.81
			HE Compressors	2.70%	12%	8%	15	54.7	O	3%	0.00010	3.28
			Insulated Suction Lines	2.70%	10%	1%	10	54.7	L	1%	0.00010	1.63
			Liquid Pressure Amplifiers	2.70%	100%	5%	10	54.7	O	1%	0.00010	6.38
			Mechanical Subcooling - additional subcooled compressor, valve,	2.70%	100%	5%	10	54.7	L	1%	0.00010	5.18
			Parallel Rack Systems	2.70%	100%	5%	10	54.7	L	1%	0.00010	6.24
			Refrigeration E-Cube	2.70%	5%	2%	10	54.7	O	7%	0.00010	2.77
			Refrigeration System Maintenance	2.70%	8%	5%	10	54.7	O	7%	0.00010	6.24
			Strip Curtains	0.30%	12%	4%	5	27.3	O	10%	0.00010	6.99
			VSD on Refrigeration Circulating Pump	0.05%	10%	30%	10	1.1	H	8%	0.00010	1.88
			VSD on Refrigeration Fan	0.05%	10%	30%	10	1.1	H	8%	0.00010	3.45
		Refrig - Display	Anti-sweat heater controls	0.30%	20%	6%	10	18.0	O	10%	0.00010	5.98
			Case Lights-off timer (12am and 6am)	0.30%	25%	25%	2	18.0	M	5%	0.00010	20.48
			New case doors	0.30%	5%	20%	12	18.0	O	10%	0.00010	6.76
			Night Covers for Display Cases	0.30%	20%	6%	5	18.0	H	8%	0.00010	2.82
			Refrigerated Case Doors - Door Misers	0.30%	0%	10%	5	18.0	H	8%	0.00010	6.99
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.30%	31%	3%	12	18.0	O	10%	0.00010	14.18

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Health Care	ROB	Comp./Data Ctr.	HE (ES) Computers	7.00%	75%	25%	10	19.5	M	13%	0.00014	4.53
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.1	L	4%	0.00014	6.87
			HE (ES) Fryers	0.03%	25%	15%	10	0.1	L	4%	0.00014	2.62
			HE (ES) Hot Food Holding Cabinets	0.06%	25%	60%	10	0.1	L	4%	0.00014	7.76
			HE (ES) Steam Cookers / Steamers	0.03%	25%	50%	10	0.1	L	4%	0.00014	6.87
			HE Broilers	0.03%	40%	18%	10	0.1	L	4%	0.00014	3.08
			HE Griddles	0.03%	40%	32%	10	0.1	L	4%	0.00014	4.94
			HE Induction Cooking	0.03%	25%	20%	10	0.1	L	4%	0.00014	3.37
			HE Ovens	0.03%	42%	2%	10	0.1	L	4%	0.00014	0.24
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00014	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.05%	5%	65%	10	0.1	L	4%	0.00014	5.74
			HE Clothes Washers	1.62%	20%	35%	10	3.2	M	13%	0.00014	3.33
			HE Dishwashers	1.62%	20%	25%	10	3.2	M	13%	0.00014	1.32
			HE Water Heaters	3.56%	18%	5%	10	10.8	M	13%	0.00014	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	10.8	M	13%	0.00014	3.67
		HVAC	HE Chillers (air and water cooled)	8.10%	33%	25%	23	8.8	M	13%	0.00051	3.82
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	1.1	M	13%	0.00000	6.63
				0.90%	5%	36%	21	1.3	O	25%	0.00051	1.27
			HE Packaged AC (non rooftop)	4.27%	25%	16%	15	8.1	O	25%	0.00051	7.80
			HE Rooftop AC systems	4.27%	10%	25%	15	8.1	O	25%	0.00051	8.12
			PTAC and PTHP	1.19%	15%	30%	15	1.8	O	25%	0.00051	1.96
		Lighting	CFL Screw in	1.23%	40%	71%	6	15.2	L	4%	0.00014	9.74
			HPT8 Fixture to replace T8	26.37%	10%	11%	10	52.8	O	6%	0.00014	1.21
			LED Refrigerated Case Door Lighting	0.00%	20%	25%	20	0.0	H	25%	0.00014	5.90
			LED Task Lighting	1.48%	2%	35%	20	3.3	M	13%	0.00014	1.01
		Plug load	HE (ES) Icemakers	0.30%	25%	25%	10	0.6	L	4%	0.00014	0.70
			HE (ES) Other Office Equipment	1.50%	25%	25%	10	3.0	M	13%	0.00014	2.13
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00014	1.14
			HE (ES) Water Cooler	0.10%	25%	15%	10	0.2	M	13%	0.00014	0.43
			HE Commercial Clothes Dryers	0.20%	20%	10%	10	0.4	M	13%	0.00014	2.73
			HE Commercial Clothes Washers	0.20%	20%	35%	10	0.4	M	13%	0.00014	6.95
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00014	1.62
		Refrig	ECM Motors on fans	2.70%	51%	7%	15	4.2	O	7%	0.00010	7.45
			Evaporative Cooling	2.70%	10%	5%	10	6.0	L	4%	0.00010	6.24
			HE Compressors	2.70%	12%	8%	15	4.2	O	20%	0.00010	12.05
			PSC Motors on fans	2.70%	31%	4%	15	4.2	O	7%	0.00010	5.31

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Lodging	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.24%	50%	40%	10	0.0	H	25%	0.00011	2.59
		DHW	HE Water Heating System Design	1.08%	15%	5%	10	1.1	M	13%	0.00012	1.19
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00005	55.71
			Solar Pool Heater	0.00%	0%	40%	30	0.1	L	4%	0.00012	1.52
		HVAC	Desiccant Dehumidification	15.00%	5%	5%	15	3.2	L	4%	0.00058	2.37
			Economizer	9.00%	75%	20%	15	1.4	M	13%	0.00058	9.48
			Energy Management System	9.00%	50%	10%	15	1.4	M	13%	0.00058	6.99
			High performance integrated design	9.00%	15%	30%	20	1.4	O	28%	0.00058	7.70
			HVAC System Commissioning	9.00%	0%	10%	10	1.4	H	25%	0.00058	6.20
			Shell: Improved Insulation and Air Sealing	7.20%	10%	8%	20	1.4	M	13%	0.00055	10.28
			Shell: Reduced Solar Gain	8.10%	25%	11%	20	1.4	H	25%	0.00055	0.40
		Lighting	Bi-level stairwell lighting	0.90%	71%	50%	10	0.2	M	13%	0.00011	10.36
			CFL Fixture	11.70%	50%	69%	15	2.1	M	13%	0.00011	9.27
			Efficient lighting design/layout	32.00%	30%	20%	10	5.1	O	20%	0.00011	7.38
			Electronic ballast	5.28%	90%	30%	10	0.8	M	13%	0.00011	6.04
			HPT8 Fixture to replace T8	10.72%	10%	11%	10	1.7	O	50%	0.00011	1.99
			LED Exterior Lighting	0.89%	1%	90%	10	0.2	L	4%	0.00011	1.69
			LED Task Lighting	7.20%	2%	35%	10	1.3	O	8%	0.00011	0.85
		Refrig	Economizer for Coolers	1.13%	20%	20%	15	0.2	M	13%	0.00000	0.00
			Evaporative Cooling	2.70%	10%	5%	10	0.5	L	4%	0.00005	7.66
			Floating Head Pressure Control	2.70%	16%	7%	10	0.5	M	13%	0.00005	6.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Lodging	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.24%	20%	45%	10	3.8	H	8%	0.00011	5.09
			Power Management Software	0.45%	45%	15%	10	9.6	M	5%	0.00011	5.10
		Cooking	HE Ventilation Hoods	0.07%	15%	60%	10	1.4	M	5%	0.00011	1.63
		DHW	DHW Fuel Switching (elec to gas)	2.38%	20%	100%	10	114.8	L	1%	0.00012	4.60
			Faucet Aerators	0.72%	40%	2%	5	11.5	M	5%	0.00012	4.13
			Grey Water Heat Exchanger	4.75%	8%	50%	10	114.8	M	5%	0.00012	1.65
			Heat Trap	4.75%	60%	5%	10	114.8	M	5%	0.00012	0.35
			Insulating Blankets	4.75%	65%	4%	5	114.8	M	5%	0.00012	1.50
			Low Flow Pre-Rinse Nozzles	0.72%	45%	55%	5	11.5	M	5%	0.00012	11.35
			Low Flow Showerhead	0.72%	15%	9%	10	11.5	M	5%	0.00012	2.79
			Pipe Insulation	0.48%	25%	1%	5	11.5	M	5%	0.00012	0.40
			Pool Cover	0.72%	5%	60%	5	12.8	M	5%	0.00012	1.15
			Reduced Temperature Setpoints	4.75%	65%	19%	10	114.8	O	3%	0.00012	5.13
			Timers	4.75%	60%	5%	10	114.8	O	3%	0.00012	0.86
			Ultrasonic Faucet Control	0.65%	15%	3%	10	11.5	M	5%	0.00012	1.12
			Water Heater Cycling	4.75%	60%	5%	10	114.8	O	3%	0.00012	0.86
		HVAC	Chilled Water Free Cooling Controls and Equipments	3.60%	68%	15%	20	63.8	M	5%	0.00058	3.13
			Chilled Water Reset, Optimizer for Chiller(s)	3.60%	25%	5%	10	63.8	M	5%	0.00058	4.28
			Desiccant Dehumidification	10.00%	5%	5%	15	318.8	L	1%	0.00058	0.64
			Energy Management System	6.75%	10%	11%	15	143.5	O	3%	0.00058	2.93
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	23.9	M	5%	0.00000	3.11
			Guest room contls	3.60%	5%	30%	10	63.8	M	5%	0.00058	3.01
			HE Chillers (air and water cooled)	3.60%	60%	15%	23	63.8	H	8%	0.00058	5.14
			HE Motors (VSDs, ECMs, on fans)	20.00%	35%	2%	10	318.8	O	8%	0.00058	6.72
			HE Rooftop AC systems	3.20%	10%	15%	15	56.7	M	5%	0.00058	10.57
			HVAC System maintenance (service buy-down)	9.00%	20%	8%	2	143.5	O	3%	0.00058	9.02
			HVAC System Retrocommissioning	9.00%	0%	15%	10	143.5	O	3%	0.00058	7.55
			Improve Duct Sealing	9.00%	15%	1%	10	143.5	O	3%	0.00058	11.39
			Insulate Pipes/Lines	9.00%	10%	1%	10	143.5	O	3%	0.00058	0.45
			Programmable Thermostat	2.25%	52%	4%	10	143.5	O	3%	0.00058	5.12
			Shell: Insulating and Air Sealing	6.75%	33%	12%	15	143.5	L	1%	0.00055	3.17
			Shell: Reduced Solar Gain	5.94%	25%	11%	15	143.5	M	5%	0.00055	0.10
			Time Clock	9.00%	95%	4%	10	143.5	O	3%	0.00058	5.12
			Ultraviolet A/C Coil Cleaning System	0.64%	25%	4%	20	11.3	M	5%	0.00058	1.87
		Lighting	Advanced Metal Halide	0.00%	15%	30%	10	0.0	O	6%	0.00011	6.11
			Bi-level stairwell lighting	0.90%	71%	50%	10	19.1	M	5%	0.00011	10.36
			CFL Screw in	9.75%	40%	71%	6	207.2	O	5%	0.00011	9.59
			Daylighting controls	0.60%	10%	20%	15	95.6	O	4%	0.00011	1.26
			Electronic ballast	5.28%	90%	30%	10	84.2	O	6%	0.00011	2.01
			Exterior light timers	1.19%	95%	25%	10	18.9	O	8%	0.00011	17.46
			HE Halogen	3.00%	1%	30%	10	63.8	M	5%	0.00011	13.66
			HO T5 lamps	0.00%	5%	45%	10	0.0	O	6%	0.00011	5.77
			HPT8 Fixture to replace T12	5.82%	20%	28%	10	92.8	O	6%	0.00011	1.49
			Induction	1.07%	5%	10%	10	18.9	O	6%	0.00011	5.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Lodging	Retrofit	Lighting	LED Exit Lights	0.29%	60%	75%	10	4.6	H	8%	0.00011	3.20
			LED Exterior Lighting	0.89%	1%	90%	10	18.9	M	5%	0.00011	1.30
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00011	0.92
			Occupancy Sensor	16.00%	22%	18%	10	255.0	O	8%	0.00011	6.99
			Scheduled interior lighting	16.00%	50%	0%	14	255.0	L	1%	0.00000	0.00
			Upgrade Ellipsoidal Reflector Lamps	0.12%	70%	30%	10	2.6	O	6%	0.00011	5.21
		Plug load	HE Battery Charging Station	0.06%	10%	35%	10	1.0	M	5%	0.00011	4.85
			Plug Load Sensors	2.70%	70%	20%	10	43.0	L	1%	0.00011	5.93
			TOD Pool Pump Timer	0.80%	5%	10%	5	12.8	M	5%	0.00012	3.53
			Vendor Miser	0.01%	30%	46%	10	0.2	M	5%	0.00011	2.21
		Refrig	Air Curtain Technologies	1.35%	10%	4%	10	23.9	L	1%	0.00005	5.21
			Ambient Sub-Cooling - oversized condenser	2.70%	10%	5%	10	47.8	O	1%	0.00005	2.03
			Condensate Evaporator	2.70%	10%	5%	10	47.8	L	1%	0.00005	6.12
			Cooler/Freezer Door Auto Closers	0.23%	25%	4%	5	23.9	H	8%	0.00005	6.86
			Cooler/Freezer Door Gaskets	0.60%	25%	2%	5	23.9	H	8%	0.00005	5.47
			Cycle fan off with thermostat; duty cycle occasionally when off	0.90%	25%	5%	5	47.8	M	5%	0.00005	11.88
			Defrost Control System	2.70%	55%	3%	10	47.8	L	1%	0.00005	4.28
			Economizer for Coolers	1.13%	20%	20%	15	23.9	L	1%	0.00005	8.46
			Evaporative Cooling	2.70%	10%	5%	10	47.8	L	1%	0.00005	6.12
			Evaporator Fan Controller	0.05%	10%	30%	10	1.0	L	1%	0.00005	14.80
			Floating Head Pressure Control	2.70%	8%	7%	10	47.8	M	5%	0.00005	7.66
			HE Compressors	2.70%	12%	8%	15	47.8	O	3%	0.00005	3.22
			Insulated Suction Lines	2.70%	10%	1%	10	47.8	L	1%	0.00005	1.60
			Liquid Pressure Amplifiers	2.70%	100%	5%	10	47.8	O	1%	0.00005	6.26
			Mechanical Subcooling - additional subcooled compressor, valve,	2.70%	100%	5%	10	47.8	L	1%	0.00005	5.08
			Parallel Rack Systems	2.70%	100%	5%	10	47.8	L	1%	0.00005	6.12
			Refrigeration E-Cube	2.70%	5%	2%	10	47.8	O	7%	0.00005	2.72
			Refrigeration System Maintenance	2.70%	8%	5%	10	47.8	O	7%	0.00005	6.12
			Strip Curtains	0.30%	12%	4%	5	23.9	O	10%	0.00005	6.86
			VSD on Refrigeration Circulating Pump	0.05%	10%	30%	10	1.0	H	8%	0.00005	1.84
			VSD on Refrigeration Fan	0.05%	10%	30%	10	1.0	H	8%	0.00005	3.38
		Refrig - Display	Anti-sweat heater controls	0.30%	20%	6%	10	15.8	O	10%	0.00005	5.87
			Case Lights-off timer (12am and 6am)	0.30%	25%	25%	2	15.8	M	5%	0.00005	20.11
			New case doors	0.30%	5%	20%	12	15.8	O	10%	0.00005	6.63
			Night Covers for Display Cases	0.30%	20%	6%	5	15.8	H	8%	0.00005	2.77
			Refrigerated Case Doors - Door Misers	0.30%	0%	10%	5	15.8	H	8%	0.00005	6.86
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.30%	31%	3%	12	15.8	O	10%	0.00005	13.92

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Lodging	ROB	Comp./Data Ctr.	HE (ES) Computers	0.60%	75%	25%	10	1.5	M	13%	0.00011	4.46
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.1	L	4%	0.00011	6.78
			HE (ES) Fryers	0.03%	25%	15%	10	0.1	L	4%	0.00011	2.59
			HE (ES) Hot Food Holding Cabinets	0.06%	25%	60%	10	0.1	L	4%	0.00011	7.67
			HE (ES) Steam Cookers / Steamers	0.03%	25%	50%	10	0.1	L	4%	0.00011	6.78
			HE Broilers	0.03%	25%	18%	10	0.1	L	4%	0.00011	3.04
			HE Griddles	0.03%	40%	32%	10	0.1	L	4%	0.00011	4.88
			HE Induction Cooking	0.03%	25%	20%	10	0.1	L	4%	0.00011	3.33
			HE Ovens	0.03%	43%	2%	10	0.1	L	4%	0.00011	0.23
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00011	0.26
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.05%	5%	65%	10	0.1	L	4%	0.00011	5.67
			HE Clothes Washers	2.16%	20%	35%	10	3.8	M	13%	0.00012	3.30
			HE Dishwashers	2.16%	20%	25%	10	3.8	M	13%	0.00012	1.31
			HE Water Heaters	4.75%	18%	5%	10	12.6	M	13%	0.00012	0.92
			Heat Pump Water Heating	3.56%	5%	59%	10	9.5	M	13%	0.00012	1.32
		HVAC	HE Chillers (air and water cooled)	3.60%	33%	25%	23	3.4	H	25%	0.00058	3.92
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	1.0	M	13%	0.00000	6.63
				0.68%	5%	36%	21	0.8	O	25%	0.00058	1.31
			HE Packaged AC (non rooftop)	3.20%	25%	16%	15	5.3	O	25%	0.00058	8.00
			HE Rooftop AC systems	3.20%	10%	25%	15	5.3	O	25%	0.00058	8.32
			PTAC and PTHP	3.60%	15%	30%	15	4.9	O	25%	0.00058	2.01
		Lighting	CFL Screw in	9.75%	40%	71%	6	105.7	M	13%	0.00011	9.59
			HPT8 Fixture to replace T8	10.72%	5%	11%	10	18.8	O	6%	0.00011	1.19
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00011	5.81
			LED Task Lighting	7.20%	2%	35%	20	14.0	M	13%	0.00011	1.00
		Plug load	HE (ES) Icemakers	1.20%	25%	25%	10	2.1	L	4%	0.00011	0.69
			HE (ES) Other Office Equipment	0.60%	25%	25%	10	1.1	M	13%	0.00011	2.10
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00011	1.13
			HE (ES) Water Cooler	0.06%	25%	15%	10	0.1	M	13%	0.00011	0.42
			HE Commercial Clothes Dryers	0.30%	20%	10%	10	0.5	M	13%	0.00011	2.69
			HE Commercial Clothes Washers	0.30%	43%	35%	10	0.5	M	13%	0.00011	6.85
			Low Pressure Drop Pool Filter	0.72%	5%	5%	1	12.9	M	13%	0.00012	0.54
		Refrig	ECM Motors on fans	2.70%	51%	7%	15	3.7	O	7%	0.00005	7.31
			Evaporative Cooling	2.70%	10%	5%	10	5.3	L	4%	0.00005	6.12
			HE Compressors	2.70%	12%	8%	15	3.7	O	20%	0.00005	11.83
			PSC Motors on fans	2.70%	31%	4%	15	3.7	O	7%	0.00005	5.21

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Mercantile	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.08%	50%	40%	10	0.0	H	25%	0.00018	1.37
		DHW	HE Water Heating System Design	0.68%	15%	5%	10	1.3	M	13%	0.00018	1.22
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00008	27.04
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00018	2.26
		HVAC	Desiccant Dehumidification	9.00%	5%	5%	15	3.6	L	4%	0.00072	1.27
			Economizer	16.00%	75%	20%	15	4.7	M	13%	0.00072	6.13
			Energy Management System	29.00%	50%	10%	15	8.6	M	13%	0.00072	3.45
			High performance integrated design	29.00%	15%	30%	20	8.6	O	28%	0.00072	3.96
			HVAC System Commissioning	29.00%	0%	10%	10	8.6	H	25%	0.00072	3.24
			Shell: Improved Insulation and Air Sealing	23.20%	10%	8%	20	8.6	M	13%	0.00067	5.73
			Shell: Reduced Solar Gain	26.10%	25%	4%	20	8.6	H	25%	0.00067	0.62
		Lighting	Bi-level stairwell lighting	1.72%	10%	50%	10	0.8	M	13%	0.00018	7.37
			CFL Fixture	7.20%	50%	69%	15	2.4	M	13%	0.00018	6.59
			Efficient lighting design/layout	41.00%	30%	20%	10	12.1	O	20%	0.00018	4.68
			Electronic ballast	12.58%	90%	30%	10	3.7	M	13%	0.00018	3.65
			HPT8 Fixture to replace T8	20.00%	10%	11%	10	5.9	O	50%	0.00018	1.05
			LED Exterior Lighting	1.04%	1%	90%	10	0.4	L	4%	0.00018	0.87
			LED Task Lighting	2.21%	2%	35%	10	0.7	O	8%	0.00018	0.43
		Refrig	Economizer for Coolers	3.38%	20%	20%	15	1.3	M	13%	0.00000	0.00
			Evaporative Cooling	8.10%	10%	5%	10	2.7	L	4%	0.00008	4.66
			Floating Head Pressure Control	8.10%	16%	7%	10	2.7	M	13%	0.00008	3.55

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Mercantile	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.08%	20%	45%	10	2.4	H	8%	0.00018	2.87
			Power Management Software	0.15%	45%	15%	10	5.9	M	5%	0.00018	2.99
		Cooking	HE Ventilation Hoods	0.11%	15%	60%	10	4.4	M	5%	0.00000	0.00
		DHW	DHW Fuel Switching (elec to gas)	1.49%	20%	100%	10	133.2	L	1%	0.00018	5.94
			Faucet Aerators	0.45%	40%	2%	5	13.3	M	5%	0.00018	5.93
			Grey Water Heat Exchanger	2.97%	8%	5%	10	133.2	L	1%	0.00018	2.48
			Heat Trap	2.97%	60%	5%	10	133.2	M	5%	0.00018	0.55
			Insulating Blankets	2.97%	65%	4%	5	133.2	M	5%	0.00018	2.28
			Low Flow Pre-Rinse Nozzles	0.45%	45%	55%	5	13.3	M	5%	0.00018	14.15
			Low Flow Showerhead	0.45%	15%	1%	10	13.3	M	5%	0.00018	4.09
			Pipe Insulation	0.30%	25%	1%	5	13.3	M	5%	0.00018	0.61
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00018	1.75
			Reduced Temperature Setpoints	2.97%	50%	19%	10	133.2	O	3%	0.00018	7.12
			Timers	2.97%	60%	5%	10	133.2	O	3%	0.00018	1.32
			Ultrasonic Faucet Control	0.41%	15%	3%	10	13.3	M	5%	0.00018	1.71
			Water Heater Cycling	2.97%	60%	5%	10	133.2	O	3%	0.00018	1.32
		HVAC	Chilled Water Free Cooling Controls and Equipments	4.50%	4%	15%	20	148.0	M	5%	0.00072	1.72
			Chilled Water Reset, Optimizer for Chiller(s)	4.50%	25%	5%	10	148.0	M	5%	0.00072	2.37
			Desiccant Dehumidification	6.00%	5%	5%	15	355.2	L	1%	0.00072	0.33
			Energy Management System	21.75%	10%	11%	15	858.5	O	3%	0.00072	1.46
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	44.4	M	5%	0.00000	1.95
			Guest room contls	0.00%	0%	0%	10	52.1	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	4.50%	60%	15%	23	148.0	H	8%	0.00072	3.02
			HE Motors (VSDs, ECMs, on fans)	12.00%	35%	2%	10	355.2	O	8%	0.00072	3.94
			HE Rooftop AC systems	5.69%	10%	15%	15	187.1	M	5%	0.00072	7.08
			HVAC System maintenance (service buy-down)	29.00%	20%	8%	2	858.5	O	3%	0.00072	4.59
			HVAC System Retrocommissioning	29.00%	0%	15%	10	858.5	O	3%	0.00072	4.04
			Improve Duct Sealing	29.00%	15%	1%	10	858.5	O	3%	0.00072	6.44
			Insulate Pipes/Lines	29.00%	10%	1%	10	858.5	O	3%	0.00072	0.23
			Programmable Thermostat	7.25%	52%	4%	10	858.5	O	3%	0.00072	2.57
			Shell: Insulating and Air Sealing	21.75%	33%	12%	15	858.5	L	1%	0.00067	1.75
			Shell: Reduced Solar Gain	19.14%	25%	4%	15	858.5	M	5%	0.00067	0.15
			Time Clock	29.00%	95%	4%	10	858.5	O	3%	0.00072	2.57
			Ultraviolet A/C Coil Cleaning System	1.14%	25%	4%	20	37.4	M	5%	0.00072	0.99
		Lighting	Advanced Metal Halide	4.00%	15%	30%	10	118.4	O	6%	0.00018	3.70
			Bi-level stairwell lighting	1.72%	10%	50%	10	84.7	M	5%	0.00018	7.37
			CFL Screw in	6.00%	40%	71%	6	236.8	O	5%	0.00018	6.41
			Daylighting controls	0.70%	10%	20%	15	207.2	O	4%	0.00018	0.65
			Electronic ballast	12.58%	90%	30%	10	372.5	O	6%	0.00018	1.06
			Exterior light timers	1.38%	95%	25%	10	40.9	O	8%	0.00018	14.64
			HE Halogen	1.85%	1%	30%	10	72.8	M	5%	0.00018	11.26
			HO T5 lamps	0.31%	10%	45%	10	12.1	O	6%	0.00018	3.46
			HPT8 Fixture to replace T12	13.87%	5%	28%	10	410.7	O	6%	0.00018	1.54
			Induction	1.24%	5%	10%	10	40.9	O	6%	0.00018	3.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Mercantile	Retrofit	Lighting	LED Exit Lights	0.37%	60%	75%	10	10.9	H	8%	0.00018	1.76
			LED Exterior Lighting	1.04%	1%	90%	10	40.9	M	5%	0.00018	0.67
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00018	0.47
			Occupancy Sensor	38.13%	22%	2%	10	1128.8	O	8%	0.00018	4.37
			Scheduled interior lighting	38.13%	50%	10%	15	1128.8	L	1%	0.00018	10.49
			Upgrade Ellipsoidal Reflector Lamps	0.75%	80%	30%	10	29.6	O	6%	0.00018	3.06
		Plug load	HE Battery Charging Station	0.02%	10%	35%	10	0.6	M	5%	0.00018	2.82
			Plug Load Sensors	0.90%	70%	20%	10	26.6	L	1%	0.00018	3.58
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00018	5.12
			Vendor Miser	0.02%	30%	46%	10	0.6	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	4.05%	10%	4%	10	133.2	L	1%	0.00008	2.94
			Ambient Sub-Cooling - oversized condenser	8.10%	10%	5%	10	266.4	O	1%	0.00008	1.05
			Condensate Evaporator	8.10%	10%	5%	10	266.4	L	1%	0.00008	3.55
			Cooler/Freezer Door Auto Closers	0.68%	25%	4%	5	133.2	H	8%	0.00008	3.98
			Cooler/Freezer Door Gaskets	1.80%	25%	2%	5	133.2	H	8%	0.00008	3.18
			Cycle fan off with thermostat; duty cycle occasionally when off	2.70%	25%	5%	5	266.4	M	5%	0.00008	7.94
			Defrost Control System	8.10%	55%	3%	10	266.4	L	1%	0.00008	2.35
			Economizer for Coolers	3.38%	20%	20%	15	133.2	L	1%	0.00008	5.44
			Evaporative Cooling	8.10%	10%	5%	10	266.4	L	1%	0.00008	3.55
			Evaporator Fan Controller	0.16%	10%	30%	10	5.3	L	1%	0.00008	11.52
			Floating Head Pressure Control	8.10%	8%	7%	10	266.4	M	5%	0.00008	4.66
			HE Compressors	8.10%	12%	8%	15	266.4	O	3%	0.00008	1.74
			Insulated Suction Lines	8.10%	10%	1%	10	266.4	L	1%	0.00008	0.82
			Liquid Pressure Amplifiers	8.10%	100%	5%	10	266.4	O	1%	0.00008	3.65
			Mechanical Subcooling - additional subcooled compressor, valve,	8.10%	100%	5%	10	266.4	L	1%	0.00008	2.86
			Parallel Rack Systems	8.10%	100%	5%	10	266.4	L	1%	0.00008	3.55
			Refrigeration E-Cube	8.10%	5%	2%	10	266.4	O	7%	0.00008	1.44
			Refrigeration System Maintenance	8.10%	8%	5%	10	266.4	O	7%	0.00008	3.55
			Strip Curtains	0.90%	12%	4%	5	133.2	O	10%	0.00008	3.98
			VSD on Refrigeration Circulating Pump	0.14%	10%	30%	10	5.3	H	8%	0.00008	0.95
			VSD on Refrigeration Fan	0.14%	10%	30%	10	5.3	H	8%	0.00008	1.82
		Refrig - Display	Anti-sweat heater controls	0.89%	20%	6%	10	87.9	O	10%	0.00008	3.38
			Case Lights-off timer (12am and 6am)	0.89%	25%	25%	2	87.9	M	5%	0.00008	16.91
			New case doors	0.89%	5%	20%	12	87.9	O	10%	0.00008	3.94
			Night Covers for Display Cases	0.89%	20%	6%	5	87.9	H	8%	0.00008	1.45
			Refrigerated Case Doors - Door Misers	0.89%	0%	10%	5	87.9	H	8%	0.00008	3.98
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.89%	31%	3%	12	87.9	O	10%	0.00008	10.73

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Mercantile	ROB	Comp./Data Ctr.	HE (ES) Computers	0.20%	75%	25%	10	0.9	M	13%	0.00018	2.56
		Cooking	Connectionless (Boilerless) Steamers	0.04%	25%	50%	10	0.2	L	4%	0.00000	0.00
			HE (ES) Fryers	0.05%	25%	15%	10	0.2	L	4%	0.00000	0.00
			HE (ES) Hot Food Holding Cabinets	0.10%	25%	60%	10	0.3	L	4%	0.00000	0.00
			HE (ES) Steam Cookers / Steamers	0.05%	25%	50%	10	0.2	L	4%	0.00000	0.00
			HE Broilers	0.05%	40%	18%	10	0.2	L	4%	0.00000	0.00
			HE Griddles	0.05%	40%	32%	10	0.2	L	4%	0.00000	0.00
			HE Induction Cooking	0.05%	25%	20%	10	0.2	L	4%	0.00000	0.00
			HE Ovens	0.05%	20%	2%	10	0.2	L	4%	0.00018	0.12
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00000	0.00
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.08%	5%	65%	10	0.3	L	4%	0.00000	0.00
			HE Clothes Washers	0.00%	20%	35%	10	0.0	M	13%	0.00018	3.38
			HE Dishwashers	0.00%	20%	25%	10	0.0	M	13%	0.00018	1.34
			HE Water Heaters	2.97%	18%	5%	10	14.7	M	13%	0.00018	0.94
			Heat Pump Water Heating	3.56%	5%	59%	10	17.6	M	13%	0.00018	2.00
		HVAC	HE Chillers (air and water cooled)	4.50%	33%	25%	23	7.9	H	25%	0.00072	2.21
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	1.8	M	13%	0.00000	4.13
				1.20%	5%	36%	21	2.7	O	25%	0.00072	0.68
			HE Packaged AC (non rooftop)	5.69%	25%	16%	15	17.5	O	25%	0.00072	4.95
			HE Rooftop AC systems	5.69%	10%	25%	15	17.5	O	25%	0.00072	5.21
			PTAC and PTHP	1.58%	15%	30%	15	4.0	O	25%	0.00072	1.07
		Lighting	CFL Screw in	6.00%	40%	71%	6	120.8	M	13%	0.00018	6.41
			HPT8 Fixture to replace T8	20.00%	5%	11%	10	65.1	O	6%	0.00018	0.62
			LED Refrigerated Case Door Lighting	0.00%	20%	25%	20	0.0	H	25%	0.00018	3.66
			LED Task Lighting	2.21%	2%	35%	20	8.0	M	13%	0.00018	0.52
		Plug load	HE (ES) Icemakers	0.40%	25%	25%	10	1.3	L	4%	0.00018	0.71
			HE (ES) Other Office Equipment	0.20%	25%	25%	10	0.7	M	13%	0.00018	1.12
			HE (ES) Refrig. Bev. Vending Machines	0.02%	30%	20%	10	0.1	M	13%	0.00018	1.15
			HE (ES) Water Cooler	0.02%	25%	15%	10	0.1	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.10%	20%	10%	10	0.3	M	13%	0.00000	0.00
			HE Commercial Clothes Washers	0.10%	43%	35%	10	0.3	M	13%	0.00000	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00018	0.83
		Refrig	ECM Motors on fans	8.10%	51%	7%	15	20.4	O	7%	0.00008	4.51
			Evaporative Cooling	8.10%	10%	5%	10	29.3	L	4%	0.00008	3.55
			HE Compressors	8.10%	12%	8%	15	20.4	O	20%	0.00008	8.66
			PSC Motors on fans	8.10%	31%	4%	15	20.4	O	7%	0.00008	3.00

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Office	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	3.75%	50%	40%	10	2.0	H	25%	0.00019	0.96
		DHW	HE Water Heating System Design	0.27%	15%	5%	10	0.9	M	13%	0.00018	1.22
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00007	18.60
			Solar Pool Heater	0.00%	0%	40%	30	0.1	L	4%	0.00018	1.56
		HVAC	Desiccant Dehumidification	9.75%	5%	5%	15	6.8	L	4%	0.00049	0.80
			Economizer	9.00%	75%	20%	15	4.7	M	13%	0.00049	4.18
			Energy Management System	23.00%	50%	10%	15	12.0	M	13%	0.00049	2.36
			High performance integrated design	23.00%	15%	30%	20	12.0	O	28%	0.00049	2.70
			HVAC System Commissioning	23.00%	0%	10%	10	12.0	H	25%	0.00049	2.17
			Shell: Improved Insulation and Air Sealing	18.40%	10%	8%	20	12.0	M	13%	0.00046	3.93
			Shell: Reduced Solar Gain	20.70%	25%	10%	20	12.0	H	25%	0.00046	0.38
		Lighting	Bi-level stairwell lighting	2.24%	30%	50%	10	1.4	M	13%	0.00019	5.70
			CFL Fixture	1.03%	50%	69%	15	0.6	M	13%	0.00019	5.09
			Efficient lighting design/layout	38.00%	30%	20%	10	19.9	O	20%	0.00019	3.43
			Electronic ballast	12.04%	90%	30%	10	6.3	M	13%	0.00019	2.62
			HPT8 Fixture to replace T8	24.44%	10%	11%	10	12.8	O	50%	0.00019	0.72
			LED Exterior Lighting	0.59%	1%	90%	10	0.4	L	4%	0.00019	0.59
			LED Task Lighting	1.03%	2%	35%	10	0.6	O	8%	0.00019	0.29
		Refrig	Economizer for Coolers	0.38%	20%	20%	15	0.3	M	13%	0.00000	0.00
			Evaporative Cooling	0.90%	10%	5%	10	0.5	L	4%	0.00007	3.30
			Floating Head Pressure Control	0.90%	16%	7%	10	0.5	M	13%	0.00007	2.47

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Office	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	3.75%	20%	45%	10	196.4	H	8%	0.00019	2.06
			Power Management Software	10.31%	45%	15%	10	720.2	M	5%	0.00019	2.17
		Cooking	HE Ventilation Hoods	0.00%	15%	60%	10	0.0	M	5%	0.00000	0.00
		DHW	DHW Fuel Switching (elec to gas)	0.59%	20%	100%	10	94.3	L	1%	0.00018	4.83
			Faucet Aerators	0.18%	40%	1%	5	9.4	M	5%	0.00018	4.23
			Grey Water Heat Exchanger	1.19%	8%	10%	10	94.3	L	1%	0.00018	1.69
			Heat Trap	1.19%	60%	5%	10	94.3	M	5%	0.00018	0.36
			Insulating Blankets	1.19%	65%	4%	5	94.3	M	5%	0.00018	1.54
			Low Flow Pre-Rinse Nozzles	0.18%	45%	55%	5	9.4	M	5%	0.00018	11.62
			Low Flow Showerhead	0.18%	15%	1%	10	9.4	M	5%	0.00018	2.86
			Pipe Insulation	0.12%	25%	1%	5	9.4	M	5%	0.00018	0.40
			Pool Cover	0.18%	5%	60%	5	10.5	M	5%	0.00018	1.17
			Reduced Temperature Setpoints	1.19%	65%	19%	10	94.3	O	3%	0.00018	5.25
			Timers	1.19%	60%	5%	10	94.3	O	3%	0.00018	0.88
			Ultrasonic Faucet Control	0.16%	15%	3%	10	9.4	M	5%	0.00018	1.15
			Water Heater Cycling	1.19%	60%	5%	10	94.3	O	3%	0.00018	0.88
		HVAC	Chilled Water Free Cooling Controls and Equipments	3.60%	16%	15%	20	209.5	M	5%	0.00049	1.10
			Chilled Water Reset, Optimizer for Chiller(s)	3.60%	25%	5%	10	209.5	M	5%	0.00049	1.52
			Desiccant Dehumidification	6.50%	5%	5%	15	680.9	L	1%	0.00049	0.21
			Energy Management System	17.25%	10%	11%	15	1204.6	O	3%	0.00049	0.99
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	78.6	M	5%	0.00000	1.43
			Guest room contls	0.00%	0%	0%	10	51.9	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	3.60%	60%	15%	23	209.5	H	8%	0.00049	1.98
			HE Motors (VSDs, ECMs, on fans)	13.00%	35%	2%	10	680.9	O	8%	0.00049	2.58
			HE Rooftop AC systems	3.20%	10%	15%	15	186.2	M	5%	0.00049	5.01
			HVAC System maintenance (service buy-down)	23.00%	50%	8%	2	1204.6	O	3%	0.00049	3.12
			HVAC System Retrocommissioning	23.00%	0%	15%	10	1204.6	O	3%	0.00049	2.71
			Improve Duct Sealing	23.00%	15%	1%	10	1204.6	O	3%	0.00049	4.40
			Insulate Pipes/Lines	23.00%	10%	1%	10	1204.6	O	3%	0.00049	0.14
			Programmable Thermostat	5.75%	52%	10%	10	1204.6	O	3%	0.00049	1.74
			Shell: Insulating and Air Sealing	17.25%	33%	12%	15	1204.6	L	1%	0.00046	1.19
			Shell: Reduced Solar Gain	15.18%	25%	10%	15	1204.6	M	5%	0.00046	0.09
			Time Clock	23.00%	95%	4%	10	1204.6	O	3%	0.00049	1.74
			Ultraviolet A/C Coil Cleaning System	0.64%	25%	4%	20	37.2	M	5%	0.00049	0.63
		Lighting	Advanced Metal Halide	0.38%	15%	30%	10	19.9	O	6%	0.00019	2.66
			Bi-level stairwell lighting	2.24%	30%	50%	10	143.3	M	5%	0.00019	5.70
			CFL Screw in	0.86%	40%	71%	6	59.7	O	5%	0.00019	4.80
			Daylighting controls	0.40%	10%	20%	15	209.5	O	4%	0.00019	0.44
			Electronic ballast	12.04%	90%	30%	10	630.5	O	6%	0.00019	0.73
			Exterior light timers	0.79%	95%	25%	10	41.4	O	8%	0.00019	12.49
			HE Halogen	0.86%	1%	30%	10	59.7	M	5%	0.00019	9.47
			HO T5 lamps	0.29%	40%	45%	10	19.9	O	6%	0.00019	2.47
			HPT8 Fixture to replace T12	13.27%	40%	28%	10	695.1	O	6%	0.00019	1.55
			Induction	0.71%	5%	10%	10	41.4	O	6%	0.00019	2.37

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Office	Retrofit	Lighting	LED Exit Lights	0.17%	60%	75%	10	9.0	H	8%	0.00019	1.22
			LED Exterior Lighting	0.59%	1%	90%	10	41.4	M	5%	0.00019	0.45
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00019	0.39
			Occupancy Sensor	36.48%	22%	18%	10	1910.6	O	8%	0.00019	5.19
			Scheduled interior lighting	36.48%	50%	10%	16	1910.6	L	1%	0.00019	8.99
			Upgrade Ellipsoidal Reflector Lamps	0.01%	80%	30%	10	0.6	O	6%	0.00019	2.17
		Plug load	HE Battery Charging Station	0.50%	10%	35%	10	26.2	M	5%	0.00019	2.05
			Plug Load Sensors	0.50%	70%	20%	10	26.2	L	1%	0.00019	2.63
			TOD Pool Pump Timer	0.20%	5%	10%	5	10.5	M	5%	0.00018	3.61
			Vendor Miser	1.00%	30%	46%	10	52.4	M	5%	0.00019	2.28
		Refrig	Air Curtain Technologies	0.45%	10%	4%	10	26.2	L	1%	0.00007	2.02
			Ambient Sub-Cooling - oversized condenser	0.90%	10%	5%	10	52.4	O	1%	0.00007	0.70
			Condensate Evaporator	0.90%	10%	5%	10	52.4	L	1%	0.00007	2.47
			Cooler/Freezer Door Auto Closers	0.08%	25%	4%	5	26.2	H	8%	0.00007	2.77
			Cooler/Freezer Door Gaskets	0.20%	25%	2%	5	26.2	H	8%	0.00007	2.21
			Cycle fan off with thermostat; duty cycle occasionally when off	0.30%	25%	5%	5	52.4	M	5%	0.00007	5.87
			Defrost Control System	0.90%	55%	3%	10	52.4	L	1%	0.00007	1.60
			Economizer for Coolers	0.38%	20%	20%	15	26.2	L	1%	0.00007	3.95
			Evaporative Cooling	0.90%	10%	5%	10	52.4	L	1%	0.00007	2.47
			Evaporator Fan Controller	0.02%	10%	30%	10	1.0	L	1%	0.00007	9.29
			Floating Head Pressure Control	0.90%	8%	7%	10	52.4	M	5%	0.00007	3.30
			HE Compressors	0.90%	12%	8%	15	52.4	O	3%	0.00007	1.18
			Insulated Suction Lines	0.90%	10%	1%	10	52.4	L	1%	0.00007	0.55
			Liquid Pressure Amplifiers	0.90%	100%	5%	10	52.4	O	1%	0.00007	2.54
			Mechanical Subcooling - additional subcooled compressor, valve,	0.90%	100%	5%	10	52.4	L	1%	0.00007	1.96
			Parallel Rack Systems	0.90%	100%	5%	10	52.4	L	1%	0.00007	2.47
			Refrigeration E-Cube	0.90%	5%	2%	10	52.4	O	7%	0.00007	0.96
			Refrigeration System Maintenance	0.90%	8%	5%	10	52.4	O	7%	0.00007	2.47
			Strip Curtains	0.10%	12%	4%	5	26.2	O	10%	0.00007	2.77
			VSD on Refrigeration Circulating Pump	0.02%	10%	30%	10	1.0	H	8%	0.00007	0.63
			VSD on Refrigeration Fan	0.02%	10%	30%	10	1.0	H	8%	0.00007	1.23
		Refrig - Display	Anti-sweat heater controls	0.10%	20%	6%	10	17.3	O	10%	0.00007	2.34
			Case Lights-off timer (12am and 6am)	0.10%	25%	25%	2	17.3	M	5%	0.00007	14.37
			New case doors	0.10%	5%	20%	12	17.3	O	10%	0.00007	2.77
			Night Covers for Display Cases	0.10%	20%	6%	5	17.3	H	8%	0.00007	0.97
			Refrigerated Case Doors - Door Misers	0.10%	0%	10%	5	17.3	H	8%	0.00007	2.77
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.10%	31%	3%	12	17.3	O	10%	0.00007	8.60

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Office	ROB	Comp./Data Ctr.	HE (ES) Computers	13.75%	75%	25%	10	110.1	M	13%	0.00019	1.85
		Cooking	Connectionless (Boilerless) Steamers	0.00%	25%	50%	10	0.0	L	4%	0.00000	0.00
			HE (ES) Fryers	0.00%	25%	15%	10	0.0	L	4%	0.00000	0.00
			HE (ES) Hot Food Holding Cabinets	0.00%	25%	60%	10	0.0	L	4%	0.00000	0.00
			HE (ES) Steam Cookers / Steamers	0.00%	25%	50%	10	0.0	L	4%	0.00000	0.00
			HE Broilers	0.00%	40%	18%	10	0.0	L	4%	0.00000	0.00
			HE Griddles	0.00%	40%	32%	10	0.0	L	4%	0.00000	0.00
			HE Induction Cooking	0.00%	25%	20%	10	0.0	L	4%	0.00000	0.00
			HE Ovens	0.00%	20%	2%	10	0.0	L	4%	0.00019	0.08
			Solid State Temperature Controls	0.00%	15%	15%	10	0.0	M	13%	0.00019	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.00%	5%	65%	10	0.0	L	4%	0.00000	0.00
			HE Clothes Washers	0.00%	20%	35%	10	0.0	M	13%	0.00018	3.38
			HE Dishwashers	0.00%	75%	25%	10	0.0	M	13%	0.00018	1.34
			HE Water Heaters	1.19%	18%	5%	10	10.4	M	13%	0.00018	0.94
			Heat Pump Water Heating	3.56%	5%	59%	10	31.1	M	13%	0.00018	1.35
		HVAC	HE Chillers (air and water cooled)	3.60%	33%	25%	23	11.2	H	25%	0.00049	1.43
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	3.1	M	13%	0.00000	3.03
				0.68%	5%	36%	21	2.7	O	25%	0.00049	0.43
			HE Packaged AC (non rooftop)	3.20%	25%	16%	15	17.4	O	25%	0.00049	3.31
			HE Rooftop AC systems	3.20%	10%	25%	15	17.4	O	25%	0.00049	3.59
			PTAC and PTHP	0.89%	15%	30%	15	4.0	O	25%	0.00049	0.69
		Lighting	CFL Screw in	0.86%	40%	71%	6	30.5	M	13%	0.00019	4.80
			HPT8 Fixture to replace T8	24.44%	15%	11%	10	140.8	O	6%	0.00019	0.42
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00019	2.67
			LED Task Lighting	1.03%	2%	35%	20	6.6	M	13%	0.00019	0.35
		Plug load	HE (ES) Icemakers	1.25%	25%	25%	10	7.2	L	4%	0.00019	0.72
			HE (ES) Other Office Equipment	3.75%	25%	25%	10	21.6	M	13%	0.00019	0.79
			HE (ES) Refrig. Bev. Vending Machines	1.00%	30%	20%	10	5.8	M	13%	0.00019	1.16
			HE (ES) Water Cooler	0.25%	25%	15%	10	1.4	M	13%	0.00019	0.44
			HE Commercial Clothes Dryers	0.50%	20%	10%	10	2.9	M	13%	0.00000	0.00
			HE Commercial Clothes Washers	0.50%	43%	35%	10	2.9	M	13%	0.00000	0.00
			Low Pressure Drop Pool Filter	0.18%	5%	5%	1	10.6	M	13%	0.00018	0.55
		Refrig	ECM Motors on fans	0.90%	51%	7%	15	4.0	O	7%	0.00007	3.22
			Evaporative Cooling	0.90%	10%	5%	10	5.8	L	4%	0.00007	2.47
			HE Compressors	0.90%	12%	8%	15	4.0	O	20%	0.00007	6.73
			PSC Motors on fans	0.90%	31%	4%	15	4.0	O	7%	0.00007	2.07

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Other	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	27.60%	50%	40%	10	2.5	H	25%	0.00018	1.37
		DHW	HE Water Heating System Design	0.45%	15%	5%	10	0.3	M	13%	0.00017	1.21
			Heat Recovery for Hot Water Use	2.25%	28%	40%	15	0.3	M	13%	0.00010	27.04
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00017	2.24
		HVAC	Desiccant Dehumidification	3.75%	5%	5%	15	0.5	L	4%	0.00085	1.32
			Economizer	5.00%	75%	20%	15	0.5	M	13%	0.00085	6.38
			Energy Management System	10.00%	50%	10%	15	0.9	M	13%	0.00085	3.47
			High performance integrated design	10.00%	15%	30%	20	0.9	O	28%	0.00085	4.00
			HVAC System Commissioning	10.00%	0%	10%	10	0.9	H	25%	0.00085	3.30
			Shell: Improved Insulation and Air Sealing	8.00%	10%	8%	20	0.9	M	13%	0.00080	5.78
			Shell: Reduced Solar Gain	9.00%	25%	10%	20	0.9	H	25%	0.00080	0.65
		Lighting	Bi-level stairwell lighting	0.86%	10%	50%	10	0.1	M	13%	0.00018	7.38
			CFL Fixture	0.76%	50%	69%	15	0.1	M	13%	0.00018	6.60
			Efficient lighting design/layout	14.00%	30%	20%	10	1.3	O	20%	0.00018	4.68
			Electronic ballast	4.30%	90%	30%	10	0.4	M	13%	0.00018	3.65
			HPT8 Fixture to replace T8	8.72%	10%	11%	10	0.8	O	50%	0.00018	1.05
			LED Exterior Lighting	0.30%	1%	90%	10	0.0	L	4%	0.00018	0.87
			LED Task Lighting	0.76%	1%	35%	10	0.1	O	8%	0.00018	0.43
		Refrig	Economizer for Coolers	6.00%	20%	20%	15	0.7	M	13%	0.00000	0.00
			Evaporative Cooling	14.40%	10%	5%	10	1.5	L	4%	0.00010	4.69
			Floating Head Pressure Control	14.40%	16%	30%	10	1.5	M	13%	0.00010	2.80

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Other	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	27.60%	20%	45%	10	251.4	H	8%	0.00018	2.87
			Power Management Software	0.02%	45%	15%	10	0.3	M	5%	0.00018	2.99
		Cooking	HE Ventilation Hoods	0.56%	15%	60%	10	6.8	M	5%	0.00018	0.84
		DHW	DHW Fuel Switching (elec to gas)	0.99%	20%	100%	10	27.3	L	1%	0.00017	5.87
			Faucet Aerators	0.30%	40%	1%	5	2.7	M	5%	0.00017	5.89
			Grey Water Heat Exchanger	1.98%	8%	5%	10	27.3	L	1%	0.00017	2.47
			Heat Trap	1.98%	60%	5%	10	27.3	M	5%	0.00017	0.54
			Insulating Blankets	1.98%	65%	4%	5	27.3	M	5%	0.00017	2.27
			Low Flow Pre-Rinse Nozzles	0.30%	45%	55%	5	2.7	M	5%	0.00017	14.07
			Low Flow Showerhead	0.30%	15%	1%	10	2.7	M	5%	0.00017	4.07
			Pipe Insulation	0.20%	25%	1%	5	2.7	M	5%	0.00017	0.61
			Pool Cover	0.36%	5%	60%	5	3.6	M	5%	0.00017	1.74
			Reduced Temperature Setpoints	1.98%	65%	19%	10	27.3	O	3%	0.00017	7.08
			Timers	1.98%	60%	5%	10	27.3	O	3%	0.00017	1.31
			Ultrasonic Faucet Control	0.27%	5%	3%	10	2.7	M	5%	0.00017	1.70
			Water Heater Cycling	1.98%	60%	5%	10	27.3	O	3%	0.00017	1.31
		HVAC	Chilled Water Free Cooling Controls and Equipments	1.80%	68%	15%	20	18.2	M	5%	0.00085	1.79
			Chilled Water Reset, Optimizer for Chiller(s)	1.80%	25%	5%	10	18.2	M	5%	0.00085	2.46
			Desiccant Dehumidification	2.50%	5%	5%	15	45.5	L	1%	0.00085	0.34
			Energy Management System	7.50%	10%	11%	15	91.1	O	3%	0.00085	1.48
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	13.7	M	5%	0.00000	1.95
			Guest room contls	0.00%	0%	0%	10	5.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	1.80%	60%	15%	23	18.2	H	8%	0.00085	3.14
			HE Motors (VSDs, ECMs, on fans)	5.00%	35%	2%	10	45.5	O	8%	0.00085	4.10
			HE Rooftop AC systems	1.78%	10%	8%	15	18.0	M	5%	0.00085	7.37
			HVAC System maintenance (service buy-down)	10.00%	20%	8%	2	91.1	O	3%	0.00085	4.64
			HVAC System Retrocommissioning	10.00%	0%	15%	10	91.1	O	3%	0.00085	4.12
			Improve Duct Sealing	10.00%	15%	1%	10	91.1	O	3%	0.00085	6.59
			Insulate Pipes/Lines	10.00%	10%	1%	10	91.1	O	3%	0.00085	0.24
			Programmable Thermostat	2.50%	52%	4%	10	91.1	O	3%	0.00085	2.60
			Shell: Insulating and Air Sealing	7.50%	33%	12%	15	91.1	L	1%	0.00080	1.77
			Shell: Reduced Solar Gain	6.60%	25%	10%	15	91.1	M	5%	0.00080	0.16
			Time Clock	10.00%	95%	4%	10	91.1	O	3%	0.00085	2.60
			Ultraviolet A/C Coil Cleaning System	0.36%	25%	4%	20	3.6	M	5%	0.00085	1.03
		Lighting	Advanced Metal Halide	0.14%	15%	30%	10	1.3	O	6%	0.00018	3.71
			Bi-level stairwell lighting	0.86%	10%	50%	10	8.9	M	5%	0.00018	7.38
			CFL Screw in	0.63%	40%	71%	6	7.7	O	5%	0.00018	6.41
			Daylighting controls	0.20%	10%	20%	15	18.2	O	4%	0.00018	0.65
			Electronic ballast	4.30%	90%	30%	10	39.1	O	6%	0.00018	1.06
			Exterior light timers	0.40%	95%	25%	10	3.6	O	8%	0.00018	14.65
			HE Halogen	0.63%	1%	30%	10	7.7	M	5%	0.00018	11.27
			HO T5 lamps	0.11%	15%	45%	10	1.3	O	6%	0.00018	3.46
			HPT8 Fixture to replace T12	4.74%	20%	28%	10	43.1	O	6%	0.00018	1.54
			Induction	0.36%	5%	10%	10	3.6	O	6%	0.00018	3.37

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Other	Retrofit	Lighting	LED Exit Lights	0.13%	60%	75%	10	1.1	H	8%	0.00018	1.76
			LED Exterior Lighting	0.30%	1%	90%	10	3.6	M	5%	0.00018	0.67
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00018	0.58
			Occupancy Sensor	13.02%	22%	18%	10	118.6	O	8%	0.00018	5.17
			Scheduled interior lighting	13.02%	50%	10%	22	118.6	L	1%	0.00018	10.27
			Upgrade Ellipsoidal Reflector Lamps	0.01%	80%	30%	10	0.1	O	6%	0.00018	3.06
		Plug load	HE Battery Charging Station	0.03%	10%	35%	10	0.3	M	5%	0.00018	2.82
			Plug Load Sensors	1.20%	70%	20%	10	10.9	L	1%	0.00018	3.58
			TOD Pool Pump Timer	0.40%	5%	10%	5	3.6	M	5%	0.00017	5.09
			Vendor Miser	0.10%	30%	46%	10	0.9	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	7.20%	10%	4%	10	72.9	L	1%	0.00010	2.96
			Ambient Sub-Cooling - oversized condenser	14.40%	10%	5%	10	145.7	O	1%	0.00010	1.06
			Condensate Evaporator	14.40%	10%	5%	10	145.7	L	1%	0.00010	3.58
			Cooler/Freezer Door Auto Closers	1.20%	25%	4%	5	72.9	H	8%	0.00010	4.01
			Cooler/Freezer Door Gaskets	3.20%	25%	2%	5	72.9	H	8%	0.00010	3.21
			Cycle fan off with thermostat; duty cycle occasionally when off	4.80%	25%	5%	5	145.7	M	5%	0.00010	7.99
			Defrost Control System	14.40%	55%	3%	10	145.7	L	1%	0.00010	2.37
			Economizer for Coolers	6.00%	20%	20%	15	72.9	L	1%	0.00010	5.48
			Evaporative Cooling	14.40%	10%	5%	10	145.7	L	1%	0.00010	3.58
			Evaporator Fan Controller	0.29%	10%	30%	10	2.9	L	1%	0.00010	11.60
			Floating Head Pressure Control	14.40%	8%	30%	10	145.7	M	5%	0.00010	3.72
			HE Compressors	14.40%	12%	8%	15	145.7	O	3%	0.00010	1.75
			Insulated Suction Lines	14.40%	10%	1%	10	145.7	L	1%	0.00010	0.83
			Liquid Pressure Amplifiers	14.40%	100%	5%	10	145.7	O	1%	0.00010	3.67
			Mechanical Subcooling - additional subcooled compressor, valve,	14.40%	100%	5%	10	145.7	L	1%	0.00010	2.88
			Parallel Rack Systems	14.40%	100%	5%	10	145.7	L	1%	0.00010	3.58
			Refrigeration E-Cube	14.40%	5%	2%	10	145.7	O	7%	0.00010	1.44
			Refrigeration System Maintenance	14.40%	8%	5%	10	145.7	O	7%	0.00010	3.58
			Strip Curtains	1.60%	12%	4%	5	72.9	O	10%	0.00010	4.01
			VSD on Refrigeration Circulating Pump	0.24%	10%	30%	10	2.9	H	8%	0.00010	0.96
			VSD on Refrigeration Fan	0.24%	10%	30%	10	2.9	H	8%	0.00010	1.83
		Refrig - Display	Anti-sweat heater controls	1.58%	20%	6%	10	20.0	O	10%	0.00010	3.40
			Case Lights-off timer (12am and 6am)	1.58%	25%	25%	2	20.0	M	5%	0.00010	17.01
			New case doors	1.58%	8%	20%	12	20.0	O	10%	0.00010	3.97
			Night Covers for Display Cases	1.58%	20%	6%	5	20.0	H	8%	0.00010	1.46
			Refrigerated Case Doors - Door Misers	1.58%	0%	10%	5	48.1	H	8%	0.00010	4.01
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	1.58%	31%	3%	12	20.0	O	10%	0.00010	10.79

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Other	ROB	Comp./Data Ctr.	HE (ES) Computers	0.03%	75%	25%	10	0.0	M	13%	0.00018	2.56
		Cooking	Connectionless (Boilerless) Steamers	0.19%	25%	50%	10	0.3	L	4%	0.00018	4.01
			HE (ES) Fryers	0.25%	25%	15%	10	0.3	L	4%	0.00018	1.37
			HE (ES) Hot Food Holding Cabinets	0.50%	25%	60%	10	0.5	L	4%	0.00018	4.64
			HE (ES) Steam Cookers / Steamers	0.25%	25%	50%	10	0.3	L	4%	0.00018	4.01
			HE Broilers	0.25%	25%	18%	10	0.3	L	4%	0.00018	1.63
			HE Griddles	0.25%	40%	32%	10	0.3	L	4%	0.00018	2.74
			HE Induction Cooking	0.23%	25%	0%	10	0.3	L	4%	0.00000	0.00
			HE Ovens	0.25%	12%	2%	10	0.3	L	4%	0.00018	0.12
			Solid State Temperature Controls	0.05%	15%	15%	10	0.1	M	13%	0.00018	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.38%	5%	65%	10	0.5	L	4%	0.00018	3.25
			HE Clothes Washers	0.90%	20%	35%	10	0.9	M	13%	0.00017	3.36
			HE Dishwashers	0.90%	20%	25%	10	0.9	M	13%	0.00017	1.34
			HE Water Heaters	1.98%	18%	5%	10	3.0	M	13%	0.00017	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	5.4	M	13%	0.00017	1.99
		HVAC	HE Chillers (air and water cooled)	1.80%	33%	25%	23	1.0	H	25%	0.00085	2.30
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	0.5	M	13%	0.00000	4.13
				0.38%	5%	36%	21	0.3	O	25%	0.00085	0.71
			HE Packaged AC (non rooftop)	1.78%	25%	16%	15	1.7	O	25%	0.00085	5.16
			HE Rooftop AC systems	1.78%	10%	17%	15	1.7	O	25%	0.00085	5.42
			PTAC and PTHP	0.50%	15%	30%	15	0.4	O	25%	0.00085	1.11
		Lighting	CFL Screw in	0.63%	40%	71%	6	3.9	M	13%	0.00018	6.41
			HPT8 Fixture to replace T8	8.72%	20%	11%	10	8.7	O	6%	0.00018	0.62
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00018	4.50
			LED Task Lighting	0.76%	1%	35%	20	0.8	M	13%	0.00018	0.52
		Plug load	HE (ES) Icemakers	0.06%	75%	25%	10	0.1	L	4%	0.00018	0.71
			HE (ES) Other Office Equipment	0.03%	25%	25%	10	0.0	M	13%	0.00018	1.12
			HE (ES) Refrig. Bev. Vending Machines	0.10%	30%	20%	10	0.1	M	13%	0.00018	1.16
			HE (ES) Water Cooler	0.03%	25%	15%	10	0.0	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.15%	20%	10%	10	0.2	M	13%	0.00018	1.46
			HE Commercial Clothes Washers	0.15%	43%	35%	10	0.2	M	13%	0.00018	4.27
			Low Pressure Drop Pool Filter	0.36%	5%	5%	1	3.7	M	13%	0.00017	0.83
		Refrig	ECM Motors on fans	14.40%	51%	7%	15	11.2	O	7%	0.00010	4.54
			Evaporative Cooling	14.40%	10%	5%	10	16.0	L	4%	0.00010	3.58
			HE Compressors	14.40%	12%	8%	15	11.2	O	20%	0.00010	8.72
			PSC Motors on fans	14.40%	31%	4%	15	11.2	O	7%	0.00010	3.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Asse	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.16%	50%	40%	10	0.0	H	25%	0.00018	0.88
		DHW	HE Water Heating System Design	0.81%	15%	5%	10	0.6	M	13%	0.00017	1.21
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00010	16.91
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00017	1.46
		HVAC	Desiccant Dehumidification	13.50%	5%	5%	15	2.0	L	4%	0.00085	0.84
			Economizer	8.00%	75%	20%	15	0.9	M	13%	0.00085	4.44
			Energy Management System	26.50%	50%	10%	15	3.0	M	13%	0.00085	2.18
			High performance integrated design	26.50%	15%	30%	20	3.0	O	28%	0.00085	2.54
			HVAC System Commissioning	26.50%	0%	10%	10	3.0	H	25%	0.00085	2.11
			Shell: Improved Insulation and Air Sealing	21.20%	10%	8%	20	3.0	M	13%	0.00080	3.69
			Shell: Reduced Solar Gain	23.85%	25%	10%	20	3.0	H	25%	0.00080	0.40
		Lighting	Bi-level stairwell lighting	1.98%	40%	50%	10	0.3	M	13%	0.00018	5.44
			CFL Fixture	1.78%	50%	69%	15	0.2	M	13%	0.00018	4.86
			Efficient lighting design/layout	33.00%	30%	20%	10	3.8	O	20%	0.00018	3.24
			Electronic ballast	10.13%	90%	30%	10	1.2	M	13%	0.00018	2.47
			HPT8 Fixture to replace T8	20.56%	10%	11%	10	2.3	O	50%	0.00018	0.68
			LED Exterior Lighting	0.59%	1%	90%	10	0.1	L	4%	0.00018	0.55
			LED Task Lighting	1.78%	2%	35%	10	0.2	O	8%	0.00018	0.27
		Refrig	Economizer for Coolers	0.75%	0%	20%	15	0.1	M	13%	0.00000	0.00
			Evaporative Cooling	1.80%	10%	5%	10	0.2	L	4%	0.00010	3.22
			Floating Head Pressure Control	1.80%	16%	7%	10	0.2	M	13%	0.00010	2.40

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Asse	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.16%	20%	45%	10	1.8	H	8%	0.00018	1.88
			Power Management Software	0.30%	45%	15%	10	4.6	M	5%	0.00018	1.99
		Cooking	HE Ventilation Hoods	0.56%	15%	60%	10	8.5	M	5%	0.00018	0.53
		DHW	DHW Fuel Switching (elec to gas)	1.78%	20%	100%	10	61.5	L	1%	0.00017	4.61
			Faucet Aerators	0.54%	40%	1%	5	6.1	M	5%	0.00017	3.99
			Grey Water Heat Exchanger	3.56%	8%	5%	10	61.5	L	1%	0.00017	1.58
			Heat Trap	3.56%	60%	5%	10	61.5	M	5%	0.00017	0.34
			Insulating Blankets	3.56%	65%	4%	5	61.5	M	5%	0.00017	1.44
			Low Flow Pre-Rinse Nozzles	0.54%	45%	55%	5	6.1	M	5%	0.00017	11.18
			Low Flow Showerhead	0.54%	15%	1%	10	6.1	M	5%	0.00017	2.69
			Pipe Insulation	0.36%	25%	1%	5	6.1	M	5%	0.00017	0.38
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00017	1.10
			Reduced Temperature Setpoints	3.56%	50%	19%	10	61.5	O	3%	0.00017	4.98
			Timers	3.56%	60%	5%	10	61.5	O	3%	0.00017	0.82
			Ultrasonic Faucet Control	0.49%	15%	3%	10	6.1	M	5%	0.00017	1.07
			Water Heater Cycling	3.56%	60%	5%	10	61.5	O	3%	0.00017	0.82
		HVAC	Chilled Water Free Cooling Controls and Equipments	2.70%	16%	15%	20	34.2	M	5%	0.00085	1.16
			Chilled Water Reset, Optimizer for Chiller(s)	2.70%	25%	5%	10	34.2	M	5%	0.00085	1.60
			Desiccant Dehumidification	9.00%	5%	5%	15	204.9	L	1%	0.00085	0.22
			Energy Management System	19.88%	10%	11%	15	301.7	O	3%	0.00085	0.93
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	17.1	M	5%	0.00000	1.36
			Guest room contls	0.00%	0%	0%	10	10.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	2.70%	60%	15%	23	34.2	H	8%	0.00085	2.09
			HE Motors (VSDs, ECMs, on fans)	18.00%	35%	2%	10	204.9	O	8%	0.00085	2.72
			HE Rooftop AC systems	2.67%	10%	15%	15	33.7	M	5%	0.00085	5.20
			HVAC System maintenance (service buy-down)	26.50%	50%	8%	2	301.7	O	3%	0.00085	2.94
			HVAC System Retrocommissioning	26.50%	0%	15%	10	301.7	O	3%	0.00085	2.65
			Improve Duct Sealing	26.50%	15%	1%	10	301.7	O	3%	0.00085	4.34
			Insulate Pipes/Lines	26.50%	10%	1%	10	301.7	O	3%	0.00085	0.15
			Programmable Thermostat	6.63%	52%	4%	10	301.7	O	3%	0.00085	1.64
			Shell: Insulating and Air Sealing	19.88%	33%	12%	15	301.7	L	1%	0.00080	1.11
			Shell: Reduced Solar Gain	17.49%	25%	10%	15	301.7	M	5%	0.00080	0.10
			Time Clock	26.50%	95%	4%	10	301.7	O	3%	0.00085	1.64
			Ultraviolet A/C Coil Cleaning System	0.57%	25%	4%	20	7.2	M	5%	0.00085	0.66
		Lighting	Advanced Metal Halide	0.33%	15%	30%	10	3.8	O	6%	0.00018	2.51
			Bi-level stairwell lighting	1.98%	40%	50%	10	26.2	M	5%	0.00018	5.44
			CFL Screw in	1.49%	40%	71%	6	22.5	O	5%	0.00018	4.56
			Daylighting controls	0.40%	10%	20%	15	45.5	O	4%	0.00018	0.42
			Electronic ballast	10.13%	90%	30%	10	115.3	O	6%	0.00018	0.68
			Exterior light timers	0.79%	95%	25%	10	9.0	O	8%	0.00018	12.10
			HE Halogen	1.49%	1%	30%	10	22.5	M	5%	0.00018	9.15
			HO T5 lamps	0.25%	30%	45%	10	3.8	O	6%	0.00018	2.33
			HPT8 Fixture to replace T12	11.17%	30%	28%	10	127.1	O	6%	0.00018	1.54
			Induction	0.71%	5%	10%	10	9.0	O	6%	0.00018	2.23

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Asse	Retrofit	Lighting	LED Exit Lights	0.30%	60%	75%	10	3.4	H	8%	0.00018	1.14
			LED Exterior Lighting	0.59%	1%	90%	10	9.0	M	5%	0.00018	0.42
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00018	0.37
			Occupancy Sensor	30.69%	22%	18%	10	349.4	O	8%	0.00018	5.17
			Scheduled interior lighting	30.69%	50%	10%	17	349.4	L	1%	0.00018	8.76
			Upgrade Ellipsoidal Reflector Lamps	0.01%	80%	30%	10	0.2	O	6%	0.00018	2.05
		Plug load	HE Battery Charging Station	0.04%	10%	35%	10	0.5	M	5%	0.00018	1.87
			Plug Load Sensors	1.80%	70%	20%	10	20.5	L	1%	0.00018	2.41
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00017	3.40
			Vendor Miser	0.10%	30%	46%	10	1.1	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	0.90%	10%	4%	10	11.4	L	1%	0.00010	1.97
			Ambient Sub-Cooling - oversized condenser	1.80%	10%	5%	10	22.8	O	1%	0.00010	0.68
			Condensate Evaporator	1.80%	10%	5%	10	22.8	L	1%	0.00010	2.40
			Cooler/Freezer Door Auto Closers	0.15%	0%	4%	5	11.4	H	8%	0.00010	2.70
			Cooler/Freezer Door Gaskets	0.40%	0%	2%	5	11.4	H	8%	0.00010	2.16
			Cycle fan off with thermostat; duty cycle occasionally when off	0.60%	0%	5%	5	22.8	M	5%	0.00010	5.75
			Defrost Control System	1.80%	55%	3%	10	22.8	L	1%	0.00010	1.56
			Economizer for Coolers	0.75%	0%	20%	15	11.4	L	1%	0.00010	3.87
			Evaporative Cooling	1.80%	10%	5%	10	22.8	L	1%	0.00010	2.40
			Evaporator Fan Controller	0.04%	10%	30%	10	0.5	L	1%	0.00010	9.18
			Floating Head Pressure Control	1.80%	8%	7%	10	22.8	M	5%	0.00010	3.22
			HE Compressors	1.80%	12%	8%	15	22.8	O	3%	0.00010	1.14
			Insulated Suction Lines	1.80%	10%	1%	10	22.8	L	1%	0.00010	0.53
			Liquid Pressure Amplifiers	1.80%	100%	5%	10	22.8	O	1%	0.00010	2.47
			Mechanical Subcooling - additional subcooled compressor, valve,	1.80%	100%	5%	10	22.8	L	1%	0.00010	1.91
			Parallel Rack Systems	1.80%	100%	5%	10	22.8	L	1%	0.00010	2.40
			Refrigeration E-Cube	1.80%	5%	2%	10	22.8	O	7%	0.00010	0.93
			Refrigeration System Maintenance	1.80%	8%	5%	10	22.8	O	7%	0.00010	2.40
			Strip Curtains	0.20%	0%	4%	5	11.4	O	10%	0.00010	2.70
			VSD on Refrigeration Circulating Pump	0.03%	10%	30%	10	0.5	H	8%	0.00010	0.61
			VSD on Refrigeration Fan	0.03%	10%	30%	10	0.5	H	8%	0.00010	1.19
		Refrig - Display	Anti-sweat heater controls	0.20%	0%	6%	10	7.5	O	10%	0.00010	2.28
			Case Lights-off timer (12am and 6am)	0.20%	0%	25%	2	7.5	M	5%	0.00010	14.27
			New case doors	0.20%	0%	20%	12	7.5	O	10%	0.00010	2.70
			Night Covers for Display Cases	0.20%	0%	6%	5	7.5	H	8%	0.00010	0.94
			Refrigerated Case Doors - Door Misers	0.20%	0%	10%	5	7.5	H	8%	0.00010	2.70
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.20%	0%	3%	12	7.5	O	10%	0.00010	8.49

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Asse	ROB	Comp./Data Ctr.	HE (ES) Computers	0.40%	75%	25%	10	0.7	M	13%	0.00018	1.69
		Cooking	Connectionless (Boilerless) Steamers	0.19%	25%	50%	10	0.3	L	4%	0.00018	2.68
			HE (ES) Fryers	0.25%	25%	15%	10	0.3	L	4%	0.00018	0.88
			HE (ES) Hot Food Holding Cabinets	0.50%	25%	60%	10	0.6	L	4%	0.00018	3.14
			HE (ES) Steam Cookers / Steamers	0.25%	25%	50%	10	0.3	L	4%	0.00018	2.68
			HE Broilers	0.25%	40%	18%	10	0.3	L	4%	0.00018	1.05
			HE Griddles	0.25%	40%	32%	10	0.3	L	4%	0.00018	1.79
			HE Induction Cooking	0.23%	25%	20%	10	0.3	L	4%	0.00018	1.16
			HE Ovens	0.25%	20%	2%	10	0.3	L	4%	0.00018	0.07
			Solid State Temperature Controls	0.05%	15%	15%	10	0.1	M	13%	0.00018	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.38%	5%	65%	10	0.6	L	4%	0.00018	2.15
			HE Clothes Washers	0.00%	20%	35%	10	0.0	M	13%	0.00017	3.36
			HE Dishwashers	0.00%	20%	25%	10	0.0	M	13%	0.00017	1.34
			HE Water Heaters	3.56%	18%	5%	10	6.8	M	13%	0.00017	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	6.8	M	13%	0.00017	1.27
		HVAC	HE Chillers (air and water cooled)	2.70%	33%	25%	23	1.8	H	25%	0.00085	1.51
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	0.7	M	13%	0.00000	2.88
				0.60%	5%	36%	21	0.5	O	25%	0.00085	0.45
			HE Packaged AC (non rooftop)	2.84%	25%	16%	15	3.4	O	25%	0.00085	3.51
			HE Rooftop AC systems	2.84%	10%	25%	15	3.4	O	25%	0.00085	3.70
			PTAC and PTHP	0.79%	15%	30%	15	0.8	O	25%	0.00085	0.71
		Lighting	CFL Screw in	1.49%	40%	71%	6	11.5	M	13%	0.00018	4.56
			HPT8 Fixture to replace T8	20.56%	5%	11%	10	25.8	O	6%	0.00018	0.39
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00018	3.10
			LED Task Lighting	1.78%	2%	35%	20	2.5	M	13%	0.00018	0.33
		Plug load	HE (ES) Icemakers	0.80%	25%	25%	10	1.0	L	4%	0.00018	0.71
			HE (ES) Other Office Equipment	0.40%	25%	25%	10	0.5	M	13%	0.00018	0.71
			HE (ES) Refrig. Bev. Vending Machines	0.10%	30%	20%	10	0.1	M	13%	0.00018	1.16
			HE (ES) Water Cooler	0.04%	25%	15%	10	0.1	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.20%	20%	10%	10	0.3	M	13%	0.00018	0.94
			HE Commercial Clothes Washers	0.20%	43%	35%	10	0.3	M	13%	0.00018	2.92
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00017	0.51
		Refrig	ECM Motors on fans	1.80%	0%	7%	15	1.7	O	7%	0.00010	3.14
			Evaporative Cooling	1.80%	10%	5%	10	2.5	L	4%	0.00010	2.40
			HE Compressors	1.80%	12%	8%	15	1.7	O	20%	0.00010	6.62
			PSC Motors on fans	1.80%	0%	4%	15	1.7	O	7%	0.00010	2.02

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Orde	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.40%	50%	40%	10	0.0	H	25%	0.00018	1.69
		DHW	HE Water Heating System Design	0.00%	15%	5%	10	0.0	M	13%	0.00017	1.21
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00010	15.38
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00017	1.46
		HVAC	Desiccant Dehumidification	1.50%	5%	5%	15	0.1	M	13%	0.00085	0.89
			Economizer	2.00%	75%	20%	15	0.1	H	25%	0.00085	4.67
			Energy Management System	20.00%	50%	10%	15	0.9	H	25%	0.00085	6.23
			High performance integrated design	20.00%	15%	30%	20	0.9	O	28%	0.00085	2.58
			HVAC System Commissioning	20.00%	0%	10%	10	0.9	H	25%	0.00085	2.16
			Shell: Improved Insulation and Air Sealing	16.00%	10%	8%	20	0.9	H	25%	0.00080	3.68
			Shell: Reduced Solar Gain	18.00%	25%	10%	20	0.9	H	25%	0.00080	0.40
		Lighting	Bi-level stairwell lighting	0.48%	40%	50%	10	0.0	M	13%	0.00018	5.68
			CFL Fixture	0.43%	50%	69%	15	0.0	H	25%	0.00018	5.07
			Efficient lighting design/layout	8.00%	30%	20%	10	0.4	O	20%	0.00018	3.41
			Electronic ballast	2.46%	90%	30%	10	0.1	H	25%	0.00018	2.61
			HPT8 Fixture to replace T8	4.98%	10%	11%	10	0.2	O	50%	0.00018	0.64
			LED Exterior Lighting	0.38%	1%	90%	10	0.0	L	4%	0.00018	0.59
			LED Task Lighting	0.45%	2%	35%	10	0.0	O	8%	0.00018	0.29
		Refrig	Economizer for Coolers	0.00%	0%	20%	15	0.0	M	13%	0.00010	3.87
			Evaporative Cooling	0.00%	10%	5%	10	0.0	L	4%	0.00010	2.40
			Floating Head Pressure Control	0.00%	16%	7%	10	0.0	M	13%	0.00010	3.22

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Orde	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.40%	20%	45%	10	1.8	H	8%	0.00018	3.48
			Power Management Software	0.75%	45%	15%	10	4.6	M	5%	0.00018	3.59
		Cooking	HE Ventilation Hoods	0.11%	15%	60%	10	0.7	M	5%	0.00018	0.53
		DHW	DHW Fuel Switching (elec to gas)	0.00%	20%	100%	10	0.0	L	1%	0.00017	4.61
			Faucet Aerators	0.00%	40%	1%	5	0.0	M	5%	0.00017	3.99
			Grey Water Heat Exchanger	0.00%	8%	5%	10	0.0	L	1%	0.00017	1.58
			Heat Trap	0.00%	60%	5%	10	0.0	M	5%	0.00017	0.34
			Insulating Blankets	0.00%	65%	4%	5	0.0	M	5%	0.00017	1.44
			Low Flow Pre-Rinse Nozzles	0.00%	45%	55%	5	0.0	M	5%	0.00017	11.18
			Low Flow Showerhead	0.00%	15%	1%	10	0.0	M	5%	0.00017	2.69
			Pipe Insulation	0.00%	25%	1%	5	0.0	M	5%	0.00017	0.38
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00017	1.10
			Reduced Temperature Setpoints	0.00%	50%	19%	10	0.0	O	3%	0.00017	4.97
			Timers	0.00%	60%	5%	10	0.0	O	3%	0.00017	0.82
			Ultrasonic Faucet Control	0.00%	15%	3%	10	0.0	M	5%	0.00017	1.07
			Water Heater Cycling	0.00%	60%	5%	10	0.0	O	3%	0.00017	0.82
		HVAC	Chilled Water Free Cooling Controls and Equipments	4.50%	16%	15%	20	22.8	H	8%	0.00085	1.23
			Chilled Water Reset, Optimizer for Chiller(s)	4.50%	25%	5%	10	22.8	H	8%	0.00085	1.69
			Desiccant Dehumidification	1.00%	5%	5%	15	9.1	M	5%	0.00085	0.23
			Energy Management System	15.00%	10%	11%	15	91.1	O	3%	0.00085	0.95
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	6.8	M	5%	0.00000	1.36
			Guest room contls	0.00%	0%	0%	10	0.9	H	8%	0.00000	0.00
			HE Chillers (air and water cooled)	4.50%	60%	15%	23	22.8	H	8%	0.00085	2.21
			HE Motors (VSDs, ECMs, on fans)	2.00%	35%	2%	10	9.1	O	8%	0.00085	5.24
			HE Rooftop AC systems	2.88%	10%	15%	15	14.6	H	8%	0.00085	5.20
			HVAC System maintenance (service buy-down)	20.00%	20%	8%	2	91.1	O	3%	0.00085	2.99
			HVAC System Retrocommissioning	20.00%	0%	15%	10	91.1	O	3%	0.00085	2.73
			Improve Duct Sealing	20.00%	15%	1%	10	91.1	O	3%	0.00085	4.46
			Insulate Pipes/Lines	20.00%	10%	1%	10	91.1	O	3%	0.00085	0.78
			Programmable Thermostat	5.00%	52%	4%	10	91.1	O	3%	0.00085	1.67
			Shell: Insulating and Air Sealing	15.00%	33%	12%	15	91.1	M	5%	0.00080	3.20
			Shell: Reduced Solar Gain	13.20%	25%	10%	15	91.1	H	8%	0.00080	0.10
			Time Clock	20.00%	95%	4%	10	91.1	O	3%	0.00085	1.67
			Ultraviolet A/C Coil Cleaning System	0.14%	25%	4%	20	0.7	H	8%	0.00085	0.70
		Lighting	Advanced Metal Halide	0.08%	15%	30%	10	0.4	O	6%	0.00018	2.65
			Bi-level stairwell lighting	0.48%	40%	50%	10	2.5	M	5%	0.00018	5.68
			CFL Screw in	0.36%	40%	71%	6	2.2	O	5%	0.00018	4.78
			Daylighting controls	0.40%	10%	20%	15	18.2	O	4%	0.00018	0.39
			Electronic ballast	2.46%	90%	30%	10	11.2	O	6%	0.00018	0.72
			Exterior light timers	0.50%	95%	5%	10	2.3	O	8%	0.00018	12.45
			HE Halogen	0.36%	1%	30%	10	2.2	H	8%	0.00018	9.43
			HO T5 lamps	0.06%	30%	45%	10	0.4	O	6%	0.00018	2.46
			HPT8 Fixture to replace T12	2.71%	30%	28%	10	12.3	O	6%	0.00018	1.54
			Induction	0.45%	5%	10%	10	2.3	O	6%	0.00018	2.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Orde	Retrofit	Lighting	LED Exit Lights	0.07%	60%	75%	10	0.3	H	8%	0.00018	1.21
			LED Exterior Lighting	0.38%	1%	90%	10	2.3	M	5%	0.00018	0.45
			LED Traffic lights	1.00%	5%	90%	10	4.6	H	8%	0.00018	0.39
			Occupancy Sensor	7.44%	22%	18%	10	33.9	O	8%	0.00018	5.17
			Scheduled interior lighting	7.44%	50%	5%	18	33.9	L	1%	0.00018	8.56
			Upgrade Ellipsoidal Reflector Lamps	0.00%	80%	30%	10	0.0	O	6%	0.00018	2.16
		Plug load	HE Battery Charging Station	0.10%	10%	35%	10	0.5	M	5%	0.00018	0.58
			Plug Load Sensors	4.50%	70%	20%	10	20.5	M	5%	0.00018	4.27
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00017	3.40
			Vendor Miser	0.02%	30%	46%	10	0.1	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	0.00%	10%	4%	10	0.0	L	1%	0.00010	1.97
			Ambient Sub-Cooling - oversized condenser	0.00%	10%	5%	10	0.0	O	1%	0.00010	0.68
			Condensate Evaporator	0.00%	10%	5%	10	0.0	L	1%	0.00010	2.40
			Cooler/Freezer Door Auto Closers	0.00%	0%	4%	5	0.0	H	8%	0.00010	2.70
			Cooler/Freezer Door Gaskets	0.00%	0%	2%	5	0.0	H	8%	0.00010	2.16
			Cycle fan off with thermostat; duty cycle occasionally when off	0.00%	0%	5%	5	0.0	M	5%	0.00010	5.75
			Defrost Control System	0.00%	55%	3%	10	0.0	L	1%	0.00010	1.56
			Economizer for Coolers	0.00%	0%	20%	15	0.0	L	1%	0.00010	3.87
			Evaporative Cooling	0.00%	10%	5%	10	0.0	L	1%	0.00010	2.40
			Evaporator Fan Controller	0.00%	10%	30%	10	0.0	L	1%	0.00010	9.18
			Floating Head Pressure Control	0.00%	8%	7%	10	0.0	M	5%	0.00010	3.22
			HE Compressors	0.00%	12%	8%	15	0.0	O	3%	0.00010	6.63
			Insulated Suction Lines	0.00%	10%	1%	10	0.0	L	1%	0.00010	0.53
			Liquid Pressure Amplifiers	0.00%	100%	5%	10	0.0	O	1%	0.00010	2.47
			Mechanical Subcooling - additional subcooled compressor, valve,	0.00%	100%	5%	10	0.0	L	1%	0.00010	1.91
			Parallel Rack Systems	0.00%	100%	5%	10	0.0	L	1%	0.00010	2.40
			Refrigeration E-Cube	0.00%	5%	2%	10	0.0	O	7%	0.00010	0.93
			Refrigeration System Maintenance	0.00%	8%	5%	10	0.0	O	7%	0.00010	2.40
			Strip Curtains	0.00%	0%	4%	5	0.0	O	10%	0.00010	2.70
			VSD on Refrigeration Circulating Pump	0.00%	10%	30%	10	0.0	H	8%	0.00010	0.61
			VSD on Refrigeration Fan	0.00%	10%	30%	10	0.0	H	8%	0.00010	1.19
		Refrig - Display	Anti-sweat heater controls	0.00%	0%	6%	10	0.0	O	10%	0.00010	2.28
			Case Lights-off timer (12am and 6am)	0.00%	0%	25%	2	0.0	M	5%	0.00010	5.20
			New case doors	0.00%	0%	20%	12	0.0	O	10%	0.00010	2.70
			Night Covers for Display Cases	0.00%	0%	6%	5	0.0	H	8%	0.00010	0.94
			Refrigerated Case Doors - Door Misers	0.00%	0%	10%	5	0.0	H	8%	0.00010	2.70
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.00%	0%	3%	12	0.0	O	10%	0.00010	8.49

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Public Orde	ROB	Comp./Data Ctr.	HE (ES) Computers	1.00%	75%	25%	10	0.7	M	13%	0.00018	1.69
		Cooking	Connectionless (Boilerless) Steamers	0.04%	25%	50%	10	0.0	L	4%	0.00018	2.68
			HE (ES) Fryers	0.05%	25%	15%	10	0.0	L	4%	0.00018	0.88
			HE (ES) Hot Food Holding Cabinets	0.10%	25%	60%	10	0.1	L	4%	0.00018	3.14
			HE (ES) Steam Cookers / Steamers	0.05%	25%	50%	10	0.0	L	4%	0.00018	2.68
			HE Broilers	0.05%	40%	18%	10	0.0	L	4%	0.00018	1.05
			HE Griddles	0.05%	40%	32%	10	0.0	L	4%	0.00018	1.79
			HE Induction Cooking	0.05%	25%	20%	10	0.0	L	4%	0.00018	1.16
			HE Ovens	0.05%	20%	2%	10	0.0	L	4%	0.00018	2.18
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00018	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.08%	5%	65%	10	0.1	L	4%	0.00018	4.24
			HE Clothes Washers	0.00%	20%	35%	10	0.0	M	13%	0.00017	3.36
			HE Dishwashers	0.00%	20%	25%	10	0.0	M	13%	0.00017	1.34
			HE Water Heaters	0.00%	18%	5%	10	0.0	M	13%	0.00017	0.93
			Heat Pump Water Heating	0.00%	5%	59%	10	0.0	M	13%	0.00017	1.27
		HVAC	HE Chillers (air and water cooled)	4.50%	33%	25%	23	1.2	H	25%	0.00085	1.60
			HE Heat Pumps, including geothermal	0.15%	5%	36%	21	0.1	O	25%	0.00085	0.48
				0.25%	33%	8%	20	0.3	H	25%	0.00000	2.88
			HE Packaged AC (non rooftop)	0.72%	25%	16%	15	0.3	O	25%	0.00085	3.70
			HE Rooftop AC systems	0.72%	10%	25%	15	0.3	O	25%	0.00085	3.70
			PTAC and PTHP	0.18%	15%	30%	15	0.1	O	25%	0.00085	0.71
		Lighting	CFL Screw in	0.36%	40%	71%	6	1.1	H	25%	0.00018	4.78
			HPT8 Fixture to replace T8	4.98%	15%	11%	10	2.5	O	6%	0.00018	0.37
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00018	3.26
			LED Task Lighting	0.45%	2%	35%	20	0.3	M	13%	0.00018	0.35
		Plug load	HE (ES) Icemakers	2.00%	25%	25%	10	1.0	M	13%	0.00018	0.71
			HE (ES) Other Office Equipment	1.00%	25%	25%	10	0.5	M	13%	0.00018	0.71
			HE (ES) Refrig. Bev. Vending Machines	0.02%	30%	20%	10	0.0	M	13%	0.00018	1.16
			HE (ES) Water Cooler	0.10%	25%	15%	10	0.1	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.50%	20%	10%	10	0.3	M	13%	0.00018	2.92
			HE Commercial Clothes Washers	0.50%	43%	35%	10	0.3	M	13%	0.00018	2.92
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00017	0.51
		Refrig	ECM Motors on fans	0.00%	0%	7%	15	0.0	O	7%	0.00010	3.14
			Evaporative Cooling	0.00%	10%	5%	10	0.0	L	4%	0.00010	2.40
			HE Compressors	0.00%	12%	8%	15	0.0	O	20%	0.00010	6.63
			PSC Motors on fans	0.00%	0%	4%	15	0.0	O	7%	0.00010	2.02

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Religious W	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.16%	50%	40%	10	0.0	H	25%	0.00018	1.84
		DHW	HE Water Heating System Design	0.81%	15%	5%	10	0.2	M	13%	0.00017	1.21
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00010	15.38
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00017	1.46
		HVAC	Desiccant Dehumidification	13.50%	5%	5%	15	0.8	L	4%	0.00085	0.89
			Economizer	8.00%	75%	20%	15	0.4	M	13%	0.00085	4.67
			Energy Management System	26.50%	50%	10%	15	1.2	M	13%	0.00085	6.23
			High performance integrated design	26.50%	15%	30%	20	1.2	O	28%	0.00085	2.58
			HVAC System Commissioning	26.50%	0%	10%	10	1.2	H	25%	0.00085	2.16
			Shell: Improved Insulation and Air Sealing	21.20%	10%	8%	20	1.2	M	13%	0.00080	3.68
			Shell: Reduced Solar Gain	23.85%	25%	10%	20	1.2	H	25%	0.00080	0.40
		Lighting	Bi-level stairwell lighting	2.04%	5%	50%	10	0.1	M	13%	0.00018	5.68
			CFL Fixture	2.00%	50%	69%	15	0.1	M	13%	0.00018	5.07
			Efficient lighting design/layout	37.00%	30%	20%	10	1.7	O	20%	0.00018	3.41
			Electronic ballast	11.36%	90%	30%	10	0.5	M	13%	0.00018	2.61
			HPT8 Fixture to replace T8	23.05%	10%	11%	10	1.0	O	50%	0.00018	0.60
			LED Exterior Lighting	0.59%	1%	90%	10	0.0	L	4%	0.00018	0.59
			LED Task Lighting	2.00%	1%	35%	10	0.1	O	8%	0.00018	0.29
		Refrig	Economizer for Coolers	0.75%	0%	20%	15	0.0	M	13%	0.00010	3.87
			Evaporative Cooling	1.80%	10%	5%	10	0.1	L	4%	0.00010	2.40
			Floating Head Pressure Control	1.80%	16%	7%	10	0.1	M	13%	0.00010	3.22

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Religious W	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.16%	20%	45%	10	0.7	H	8%	0.00018	3.77
			Power Management Software	0.30%	45%	15%	10	1.8	M	5%	0.00018	3.88
		Cooking	HE Ventilation Hoods	0.06%	15%	60%	10	0.3	M	5%	0.00018	0.53
		DHW	DHW Fuel Switching (elec to gas)	1.78%	20%	100%	10	24.6	L	1%	0.00017	4.61
			Faucet Aerators	0.54%	40%	1%	5	2.5	M	5%	0.00017	3.99
			Grey Water Heat Exchanger	3.56%	8%	5%	10	24.6	L	1%	0.00017	1.58
			Heat Trap	3.56%	60%	5%	10	24.6	M	5%	0.00017	0.34
			Insulating Blankets	3.56%	65%	4%	5	24.6	M	5%	0.00017	1.44
			Low Flow Pre-Rinse Nozzles	0.54%	45%	55%	5	2.5	M	5%	0.00017	11.18
			Low Flow Showerhead	0.54%	15%	1%	10	2.5	M	5%	0.00017	2.69
			Pipe Insulation	0.36%	25%	1%	5	2.5	M	5%	0.00017	0.38
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00017	1.10
			Reduced Temperature Setpoints	3.56%	50%	19%	10	24.6	O	3%	0.00017	4.97
			Timers	3.56%	60%	5%	10	24.6	O	3%	0.00017	0.82
			Ultrasonic Faucet Control	0.49%	15%	3%	10	2.5	M	5%	0.00017	1.07
			Water Heater Cycling	3.56%	60%	5%	10	24.6	O	3%	0.00017	0.82
		HVAC	Chilled Water Free Cooling Controls and Equipments	2.70%	16%	15%	20	13.7	M	5%	0.00085	1.23
			Chilled Water Reset, Optimizer for Chiller(s)	2.70%	25%	5%	10	13.7	M	5%	0.00085	1.69
			Desiccant Dehumidification	9.00%	5%	5%	15	82.0	L	1%	0.00085	0.23
			Energy Management System	19.88%	10%	11%	15	120.7	O	3%	0.00085	0.95
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	6.8	M	5%	0.00000	1.36
			Guest room contls	0.00%	0%	0%	10	4.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	2.70%	60%	15%	23	13.7	H	8%	0.00085	2.21
			HE Motors (VSDs, ECMs, on fans)	18.00%	35%	2%	10	82.0	O	8%	0.00085	7.62
			HE Rooftop AC systems	2.67%	10%	15%	15	13.5	M	5%	0.00085	5.20
			HVAC System maintenance (service buy-down)	26.50%	20%	8%	2	120.7	O	3%	0.00085	2.99
			HVAC System Retrocommissioning	26.50%	0%	15%	10	120.7	O	3%	0.00085	2.73
			Improve Duct Sealing	26.50%	15%	1%	10	120.7	O	3%	0.00085	4.46
			Insulate Pipes/Lines	26.50%	10%	1%	10	120.7	O	3%	0.00085	0.78
			Programmable Thermostat	6.63%	52%	4%	10	120.7	O	3%	0.00085	1.67
			Shell: Insulating and Air Sealing	19.88%	33%	12%	15	120.7	L	1%	0.00080	3.20
			Shell: Reduced Solar Gain	17.49%	25%	10%	15	120.7	M	5%	0.00080	0.10
			Time Clock	26.50%	95%	4%	10	120.7	O	3%	0.00085	1.67
			Ultraviolet A/C Coil Cleaning System	0.57%	25%	4%	20	2.9	M	5%	0.00085	0.70
		Lighting	Advanced Metal Halide	0.37%	15%	30%	10	1.7	O	6%	0.00018	2.65
			Bi-level stairwell lighting	2.04%	5%	50%	10	11.8	M	5%	0.00018	5.68
			CFL Screw in	1.67%	40%	71%	6	10.1	O	5%	0.00018	4.78
			Daylighting controls	0.40%	10%	20%	15	18.2	O	4%	0.00018	0.37
			Electronic ballast	11.36%	90%	30%	10	51.7	O	6%	0.00018	0.72
			Exterior light timers	0.79%	50%	25%	10	3.6	O	8%	0.00018	12.45
			HE Halogen	1.67%	1%	30%	10	10.1	M	5%	0.00018	9.43
			HO T5 lamps	0.28%	5%	45%	10	1.7	O	6%	0.00018	2.46
			HPT8 Fixture to replace T12	12.52%	2%	28%	10	57.0	O	6%	0.00018	1.54
			Induction	0.71%	5%	10%	10	3.6	O	6%	0.00018	2.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Religious W	Retrofit	Lighting	LED Exit Lights	0.33%	60%	75%	10	1.5	H	8%	0.00018	1.21
			LED Exterior Lighting	0.59%	1%	90%	10	3.6	M	5%	0.00018	0.45
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00018	0.39
			Occupancy Sensor	34.41%	22%	18%	10	156.7	O	8%	0.00018	5.17
			Scheduled interior lighting	34.41%	50%	10%	19	156.7	L	1%	0.00018	8.35
			Upgrade Ellipsoidal Reflector Lamps	0.02%	90%	30%	10	0.1	O	6%	0.00018	2.16
		Plug load	HE Battery Charging Station	0.04%	10%	35%	10	0.2	M	5%	0.00018	0.58
			Plug Load Sensors	1.80%	70%	20%	10	8.2	L	1%	0.00018	4.59
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00017	3.40
			Vendor Miser	0.01%	30%	46%	10	0.0	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	0.90%	10%	4%	10	4.6	L	1%	0.00010	1.97
			Ambient Sub-Cooling - oversized condenser	1.80%	10%	5%	10	9.1	O	1%	0.00010	0.68
			Condensate Evaporator	1.80%	10%	5%	10	9.1	L	1%	0.00010	2.40
			Cooler/Freezer Door Auto Closers	0.15%	0%	4%	5	4.6	H	8%	0.00010	2.70
			Cooler/Freezer Door Gaskets	0.40%	0%	2%	5	4.6	H	8%	0.00010	2.16
			Cycle fan off with thermostat; duty cycle occasionally when off	0.60%	0%	5%	5	9.1	M	5%	0.00010	5.75
			Defrost Control System	1.80%	55%	3%	10	9.1	L	1%	0.00010	1.56
			Economizer for Coolers	0.75%	0%	20%	15	4.6	L	1%	0.00010	3.87
			Evaporative Cooling	1.80%	10%	5%	10	9.1	L	1%	0.00010	2.40
			Evaporator Fan Controller	0.04%	10%	30%	10	0.2	L	1%	0.00010	9.18
			Floating Head Pressure Control	1.80%	8%	7%	10	9.1	M	5%	0.00010	3.22
			HE Compressors	1.80%	12%	8%	15	9.1	O	3%	0.00010	6.63
			Insulated Suction Lines	1.80%	10%	1%	10	9.1	L	1%	0.00010	0.53
			Liquid Pressure Amplifiers	1.80%	100%	5%	10	9.1	O	1%	0.00010	2.47
			Mechanical Subcooling - additional subcooled compressor, valve,	1.80%	100%	5%	10	9.1	L	1%	0.00010	1.91
			Parallel Rack Systems	1.80%	100%	5%	10	9.1	L	1%	0.00010	2.40
			Refrigeration E-Cube	1.80%	5%	2%	10	9.1	O	7%	0.00010	0.93
			Refrigeration System Maintenance	1.80%	8%	5%	10	9.1	O	7%	0.00010	2.40
			Strip Curtains	0.20%	0%	4%	5	4.6	O	10%	0.00010	2.70
			VSD on Refrigeration Circulating Pump	0.03%	10%	30%	10	0.2	H	8%	0.00010	0.61
			VSD on Refrigeration Fan	0.03%	10%	30%	10	0.2	H	8%	0.00010	1.19
		Refrig - Display	Anti-sweat heater controls	0.20%	0%	6%	10	3.0	O	10%	0.00010	2.28
			Case Lights-off timer (12am and 6am)	0.20%	0%	25%	2	3.0	M	5%	0.00010	5.20
			New case doors	0.20%	0%	20%	12	3.0	O	10%	0.00010	2.70
			Night Covers for Display Cases	0.20%	0%	6%	5	3.0	H	8%	0.00010	0.94
			Refrigerated Case Doors - Door Misers	0.20%	0%	10%	5	3.0	H	8%	0.00010	2.70
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.20%	0%	3%	12	3.0	O	10%	0.00010	8.49

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Religious W	ROB	Comp./Data Ctr.	HE (ES) Computers	0.40%	75%	25%	10	0.3	M	13%	0.00018	1.69
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.0	L	4%	0.00018	2.68
			HE (ES) Fryers	0.03%	25%	15%	10	0.0	L	4%	0.00018	0.88
			HE (ES) Hot Food Holding Cabinets	0.05%	25%	60%	10	0.0	L	4%	0.00018	3.14
			HE (ES) Steam Cookers / Steamers	0.03%	25%	50%	10	0.0	L	4%	0.00018	2.68
			HE Broilers	0.03%	40%	18%	10	0.0	L	4%	0.00018	1.05
			HE Griddles	0.03%	40%	32%	10	0.0	L	4%	0.00018	1.79
			HE Induction Cooking	0.02%	25%	0%	10	0.0	L	4%	0.00000	0.00
			HE Ovens	0.03%	20%	2%	10	0.0	L	4%	0.00018	2.18
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00018	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.04%	5%	65%	10	0.0	L	4%	0.00018	3.92
			HE Clothes Washers	1.62%	20%	35%	10	0.8	M	13%	0.00017	3.36
			HE Dishwashers	1.62%	20%	25%	10	0.8	M	13%	0.00017	1.34
			HE Water Heaters	3.56%	18%	5%	10	2.7	M	13%	0.00017	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	2.7	M	13%	0.00017	1.27
		HVAC	HE Chillers (air and water cooled)	2.70%	33%	25%	23	0.7	H	25%	0.00085	1.60
			HE Heat Pumps, including geothermal	0.25%	33%	8%	20	0.3	M	13%	0.00000	2.88
				0.60%	5%	36%	21	0.2	O	25%	0.00085	0.48
			HE Packaged AC (non rooftop)	2.84%	25%	16%	15	1.3	O	25%	0.00085	3.70
			HE Rooftop AC systems	2.84%	10%	25%	15	1.3	O	25%	0.00085	3.70
			PTAC and PTHP	0.79%	15%	30%	15	0.3	O	25%	0.00085	0.71
		Lighting	CFL Screw in	1.67%	40%	71%	6	5.2	M	13%	0.00018	4.78
			HPT8 Fixture to replace T8	23.05%	2%	11%	10	11.5	O	6%	0.00018	0.35
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00018	3.26
			LED Task Lighting	2.00%	1%	35%	20	1.1	M	13%	0.00018	0.35
		Plug load	HE (ES) Icemakers	0.80%	25%	25%	10	0.4	L	4%	0.00018	0.71
			HE (ES) Other Office Equipment	0.40%	25%	25%	10	0.2	M	13%	0.00018	0.71
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00018	1.16
			HE (ES) Water Cooler	0.04%	25%	15%	10	0.0	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.20%	20%	10%	10	0.1	M	13%	0.00018	2.92
			HE Commercial Clothes Washers	0.20%	43%	35%	10	0.1	M	13%	0.00018	2.92
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00017	0.51
		Refrig	ECM Motors on fans	1.80%	0%	7%	15	0.7	O	7%	0.00010	3.14
			Evaporative Cooling	1.80%	10%	5%	10	1.0	L	4%	0.00010	2.40
			HE Compressors	1.80%	12%	8%	15	0.7	O	20%	0.00010	6.63
			PSC Motors on fans	1.80%	0%	4%	15	0.7	O	7%	0.00010	2.02

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Service	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.40%	50%	40%	10	0.1	H	25%	0.00018	1.37
		DHW	HE Water Heating System Design	0.68%	15%	5%	10	0.6	M	13%	0.00017	1.21
			Heat Recovery for Hot Water Use	0.00%	28%	40%	15	0.0	M	13%	0.00010	27.04
			Solar Pool Heater	0.00%	0%	40%	30	0.0	L	4%	0.00017	2.24
		HVAC	Desiccant Dehumidification	9.00%	5%	5%	15	1.6	L	4%	0.00085	1.32
			Economizer	2.00%	75%	20%	15	0.3	M	13%	0.00085	6.38
			Energy Management System	25.00%	50%	10%	15	3.4	M	13%	0.00085	3.47
			High performance integrated design	25.00%	15%	30%	20	3.4	O	28%	0.00085	4.00
			HVAC System Commissioning	25.00%	0%	10%	10	3.4	H	25%	0.00085	3.30
			Shell: Improved Insulation and Air Sealing	20.00%	10%	8%	20	3.4	M	13%	0.00080	5.78
			Shell: Reduced Solar Gain	22.50%	25%	10%	20	3.4	H	25%	0.00080	0.65
		Lighting	Bi-level stairwell lighting	0.49%	10%	50%	10	0.1	M	13%	0.00018	7.38
			CFL Fixture	1.48%	50%	69%	15	0.2	M	13%	0.00018	6.60
			Efficient lighting design/layout	41.00%	30%	20%	10	5.6	O	20%	0.00018	4.68
			Electronic ballast	16.60%	90%	30%	10	2.3	M	13%	0.00018	3.65
			HPT8 Fixture to replace T8	19.48%	10%	11%	10	2.7	O	50%	0.00018	1.05
			LED Exterior Lighting	1.04%	1%	90%	10	0.2	L	4%	0.00018	0.87
			LED Task Lighting	1.48%	1%	35%	10	0.2	O	8%	0.00018	0.43
		Refrig	Economizer for Coolers	3.00%	20%	20%	15	0.5	M	13%	0.00000	0.00
			Evaporative Cooling	7.20%	10%	5%	10	1.1	L	4%	0.00010	4.69
			Floating Head Pressure Control	7.20%	16%	7%	10	1.1	M	13%	0.00010	3.58

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Service	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.40%	20%	45%	10	5.5	H	8%	0.00018	2.87
			Power Management Software	0.75%	45%	15%	10	13.7	M	5%	0.00018	2.99
		Cooking	HE Ventilation Hoods	0.11%	15%	60%	10	2.0	M	5%	0.00000	0.00
		DHW	DHW Fuel Switching (elec to gas)	1.49%	20%	100%	10	61.5	L	1%	0.00017	5.87
			Faucet Aerators	0.45%	40%	1%	5	6.1	M	5%	0.00017	5.89
			Grey Water Heat Exchanger	2.97%	8%	5%	10	61.5	L	1%	0.00017	2.47
			Heat Trap	2.97%	60%	5%	10	61.5	M	5%	0.00017	0.54
			Insulating Blankets	2.97%	65%	4%	5	61.5	M	5%	0.00017	2.27
			Low Flow Pre-Rinse Nozzles	0.45%	45%	55%	5	6.1	M	5%	0.00017	14.07
			Low Flow Showerhead	0.45%	15%	1%	10	6.1	M	5%	0.00017	4.07
			Pipe Insulation	0.30%	25%	1%	5	6.1	M	5%	0.00017	0.61
			Pool Cover	0.00%	5%	60%	5	0.0	M	5%	0.00017	1.74
			Reduced Temperature Setpoints	2.97%	50%	19%	10	61.5	O	3%	0.00017	7.08
			Timers	2.97%	60%	5%	10	61.5	O	3%	0.00017	1.31
			Ultrasonic Faucet Control	0.41%	15%	3%	10	6.1	M	5%	0.00017	1.70
			Water Heater Cycling	2.97%	60%	5%	10	61.5	O	3%	0.00017	1.31
		HVAC	Chilled Water Free Cooling Controls and Equipments	0.90%	16%	15%	20	13.7	M	5%	0.00085	1.79
			Chilled Water Reset, Optimizer for Chiller(s)	0.90%	25%	5%	10	13.7	M	5%	0.00085	2.46
			Desiccant Dehumidification	6.00%	5%	5%	15	164.0	L	1%	0.00085	0.34
			Energy Management System	18.75%	10%	11%	15	341.6	O	3%	0.00085	1.48
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	20.5	M	5%	0.00000	1.95
			Guest room contls	0.00%	0%	0%	10	3.0	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	0.90%	60%	15%	23	13.7	H	8%	0.00085	3.14
			HE Motors (VSDs, ECMs, on fans)	12.00%	35%	2%	10	164.0	O	8%	0.00085	4.10
			HE Rooftop AC systems	2.84%	10%	15%	15	43.2	M	5%	0.00085	7.37
			HVAC System maintenance (service buy-down)	25.00%	20%	8%	2	341.6	O	3%	0.00085	4.64
			HVAC System Retrocommissioning	25.00%	0%	15%	10	341.6	O	3%	0.00085	4.12
			Improve Duct Sealing	25.00%	15%	1%	10	341.6	O	3%	0.00085	6.59
			Insulate Pipes/Lines	25.00%	10%	1%	10	341.6	O	3%	0.00085	0.24
			Programmable Thermostat	6.25%	52%	4%	10	341.6	O	3%	0.00085	2.60
			Shell: Insulating and Air Sealing	18.75%	33%	12%	15	341.6	L	1%	0.00080	1.77
			Shell: Reduced Solar Gain	16.50%	25%	10%	15	341.6	M	5%	0.00080	0.16
			Time Clock	25.00%	95%	4%	10	341.6	O	3%	0.00085	2.60
			Ultraviolet A/C Coil Cleaning System	0.14%	25%	4%	20	2.2	M	5%	0.00085	1.03
		Lighting	Advanced Metal Halide	3.28%	15%	30%	10	44.8	O	6%	0.00018	3.71
			Bi-level stairwell lighting	0.49%	10%	50%	10	7.4	M	5%	0.00018	7.38
			CFL Screw in	1.23%	40%	71%	6	22.4	O	5%	0.00018	6.41
			Daylighting controls	0.70%	10%	20%	15	95.6	O	4%	0.00018	0.65
			Electronic ballast	16.60%	90%	30%	10	226.8	O	6%	0.00018	1.06
			Exterior light timers	1.38%	95%	25%	10	18.9	O	8%	0.00018	14.65
			HE Halogen	1.23%	1%	30%	10	22.4	M	5%	0.00018	11.27
			HO T5 lamps	2.46%	50%	45%	10	44.8	O	6%	0.00018	3.46
			HPT8 Fixture to replace T12	18.30%	40%	28%	10	250.0	O	6%	0.00018	1.54
			Induction	1.24%	5%	10%	10	18.9	O	6%	0.00018	3.37

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Service	Retrofit	Lighting	LED Exit Lights	0.25%	60%	75%	10	3.4	H	8%	0.00018	1.76
			LED Exterior Lighting	1.04%	1%	90%	10	18.9	M	5%	0.00018	0.67
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00018	0.58
			Occupancy Sensor	36.08%	22%	18%	10	493.0	O	8%	0.00018	5.17
			Scheduled interior lighting	36.08%	50%	10%	20	493.0	L	1%	0.00018	10.40
			Upgrade Ellipsoidal Reflector Lamps	0.01%	60%	30%	10	0.2	O	6%	0.00018	3.06
		Plug load	HE Battery Charging Station	0.10%	10%	35%	10	1.4	M	5%	0.00018	2.82
			Plug Load Sensors	4.50%	70%	20%	10	61.5	L	1%	0.00018	3.58
			TOD Pool Pump Timer	0.00%	5%	10%	5	0.0	M	5%	0.00017	5.09
			Vendor Miser	0.02%	30%	46%	10	0.3	M	5%	0.00018	2.27
		Refrig	Air Curtain Technologies	3.60%	10%	4%	10	54.7	L	1%	0.00010	2.96
			Ambient Sub-Cooling - oversized condenser	7.20%	10%	5%	10	109.3	O	1%	0.00010	1.06
			Condensate Evaporator	7.20%	10%	5%	10	109.3	L	1%	0.00010	3.58
			Cooler/Freezer Door Auto Closers	0.60%	25%	4%	5	54.7	H	8%	0.00010	4.01
			Cooler/Freezer Door Gaskets	1.60%	25%	2%	5	54.7	H	8%	0.00010	3.21
			Cycle fan off with thermostat; duty cycle occasionally when off	2.40%	25%	5%	5	109.3	M	5%	0.00010	7.99
			Defrost Control System	7.20%	55%	3%	10	109.3	L	1%	0.00010	2.37
			Economizer for Coolers	3.00%	20%	20%	15	54.7	L	1%	0.00010	5.48
			Evaporative Cooling	7.20%	10%	5%	10	109.3	L	1%	0.00010	3.58
			Evaporator Fan Controller	0.14%	10%	30%	10	2.2	L	1%	0.00010	11.60
			Floating Head Pressure Control	7.20%	8%	7%	10	109.3	M	5%	0.00010	4.69
			HE Compressors	7.20%	12%	8%	15	109.3	O	3%	0.00010	1.75
			Insulated Suction Lines	7.20%	10%	1%	10	109.3	L	1%	0.00010	0.83
			Liquid Pressure Amplifiers	7.20%	100%	5%	10	109.3	O	1%	0.00010	3.67
			Mechanical Subcooling - additional subcooled compressor, valve,	7.20%	100%	5%	10	109.3	L	1%	0.00010	2.88
			Parallel Rack Systems	7.20%	100%	5%	10	109.3	L	1%	0.00010	3.58
			Refrigeration E-Cube	7.20%	5%	2%	10	109.3	O	7%	0.00010	1.44
			Refrigeration System Maintenance	7.20%	8%	5%	10	109.3	O	7%	0.00010	3.58
			Strip Curtains	0.80%	12%	4%	5	54.7	O	10%	0.00010	4.01
			VSD on Refrigeration Circulating Pump	0.12%	10%	30%	10	2.2	H	8%	0.00010	0.96
			VSD on Refrigeration Fan	0.12%	10%	30%	10	2.2	H	8%	0.00010	1.83
		Refrig - Display	Anti-sweat heater controls	0.79%	20%	6%	10	36.1	O	10%	0.00010	3.40
			Case Lights-off timer (12am and 6am)	0.79%	25%	25%	2	36.1	M	5%	0.00010	17.01
			New case doors	0.79%	5%	20%	12	36.1	O	10%	0.00010	3.97
			Night Covers for Display Cases	0.79%	20%	6%	5	36.1	H	8%	0.00010	1.46
			Refrigerated Case Doors - Door Misers	0.79%	0%	10%	5	20.0	H	8%	0.00010	4.01
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	0.79%	31%	3%	12	36.1	O	10%	0.00010	10.79

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Service	ROB	Comp./Data Ctr.	HE (ES) Computers	1.00%	75%	25%	10	2.1	M	13%	0.00018	2.56
		Cooking	Connectionless (Boilerless) Steamers	0.04%	25%	50%	10	0.1	L	4%	0.00000	0.00
			HE (ES) Fryers	0.05%	25%	15%	10	0.1	L	4%	0.00000	0.00
			HE (ES) Hot Food Holding Cabinets	0.10%	25%	60%	10	0.2	L	4%	0.00000	0.00
			HE (ES) Steam Cookers / Steamers	0.05%	25%	50%	10	0.1	L	4%	0.00000	0.00
			HE Broilers	0.05%	40%	18%	10	0.1	L	4%	0.00000	0.00
			HE Griddles	0.05%	40%	32%	10	0.1	L	4%	0.00000	0.00
			HE Induction Cooking	0.05%	25%	0%	10	0.1	L	4%	0.00000	0.00
			HE Ovens	0.05%	20%	2%	10	0.1	L	4%	0.00018	0.12
			Solid State Temperature Controls	0.01%	15%	15%	10	0.0	M	13%	0.00018	0.27
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.08%	5%	65%	10	0.2	L	4%	0.00000	0.00
			HE Clothes Washers	1.35%	20%	35%	10	2.0	M	13%	0.00017	3.36
			HE Dishwashers	1.35%	20%	25%	10	2.0	M	13%	0.00017	1.34
			HE Water Heaters	2.97%	18%	5%	10	6.8	M	13%	0.00017	0.93
			Heat Pump Water Heating	3.56%	5%	59%	10	8.1	M	13%	0.00017	1.99
		HVAC	HE Chillers (air and water cooled)	0.90%	33%	25%	23	0.7	H	25%	0.00085	2.30
			HE Heat Pumps, including geothermal	0.15%	5%	36%	21	0.2	O	25%	0.00085	0.71
				0.25%	33%	8%	20	0.8	M	13%	0.00000	4.13
			HE Packaged AC (non rooftop)	0.71%	25%	16%	15	1.0	O	25%	0.00085	5.16
			HE Rooftop AC systems	0.71%	10%	25%	15	1.0	O	25%	0.00085	5.42
			PTAC and PTHP	0.20%	15%	30%	15	0.2	O	25%	0.00085	1.11
		Lighting	CFL Screw in	1.23%	40%	71%	6	11.4	M	13%	0.00018	6.41
			HPT8 Fixture to replace T8	19.48%	30%	11%	10	29.3	O	6%	0.00018	0.62
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00018	4.50
			LED Task Lighting	1.48%	1%	35%	20	2.5	M	13%	0.00018	0.52
		Plug load	HE (ES) Icemakers	2.00%	25%	25%	10	3.0	L	4%	0.00018	0.71
			HE (ES) Other Office Equipment	1.00%	25%	25%	10	1.5	M	13%	0.00018	1.12
			HE (ES) Refrig. Bev. Vending Machines	0.02%	30%	20%	10	0.0	M	13%	0.00018	1.16
			HE (ES) Water Cooler	0.10%	25%	15%	10	0.2	M	13%	0.00018	0.44
			HE Commercial Clothes Dryers	0.50%	20%	10%	10	0.8	M	13%	0.00000	0.00
			HE Commercial Clothes Washers	0.50%	43%	35%	10	0.8	M	13%	0.00000	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	5%	1	0.0	M	13%	0.00017	0.83
		Refrig	ECM Motors on fans	7.20%	51%	7%	15	8.4	O	7%	0.00010	4.54
			Evaporative Cooling	7.20%	10%	5%	10	12.0	L	4%	0.00010	3.58
			HE Compressors	7.20%	12%	8%	15	8.4	O	20%	0.00010	8.72
			PSC Motors on fans	7.20%	31%	4%	15	8.4	O	7%	0.00010	3.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Warehouse	NC	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power suppl	0.08%	50%	40%	10	0.0	H	25%	0.00029	1.00
		DHW	HE Water Heating System Design	0.15%	15%	5%	10	0.3	M	13%	0.00028	1.26
			Heat Recovery for Hot Water Use	0.75%	28%	40%	15	0.3	M	13%	0.00037	18.61
			Solar Pool Heater	0.00%	0%	40%	30	0.1	L	4%	0.00028	1.66
		HVAC	Desiccant Dehumidification	7.50%	5%	5%	15	2.5	L	4%	0.00254	1.33
			Economizer	2.00%	75%	20%	15	0.5	M	13%	0.00254	6.93
			Energy Management System	12.50%	50%	10%	15	3.1	M	13%	0.00254	4.46
			High performance integrated design	12.50%	15%	30%	20	3.1	O	28%	0.00254	3.11
			HVAC System Commissioning	12.50%	0%	10%	10	3.1	H	25%	0.00254	2.77
			Shell: Improved Insulation and Air Sealing	10.00%	10%	8%	20	3.1	M	13%	0.00239	4.45
			Shell: Reduced Solar Gain	11.25%	25%	3%	20	3.1	H	25%	0.00239	0.65
		Lighting	Bi-level stairwell lighting	0.21%	20%	50%	10	0.1	M	13%	0.00029	5.93
			CFL Fixture	0.65%	50%	69%	15	0.2	M	13%	0.00029	5.30
			Efficient lighting design/layout	18.00%	30%	20%	10	4.5	O	20%	0.00029	3.56
			Electronic ballast	7.29%	90%	30%	10	1.8	H	25%	0.00029	2.72
			HPT8 Fixture to replace T8	8.55%	10%	11%	10	2.1	O	50%	0.00029	1.04
			LED Exterior Lighting	0.44%	1%	90%	10	0.1	L	4%	0.00029	0.61
			LED Task Lighting	0.65%	1%	35%	10	0.2	O	8%	0.00029	0.30
		Refrig	Economizer for Coolers	21.75%	20%	20%	15	7.3	M	13%	0.00000	0.00
			Evaporative Cooling	52.20%	10%	5%	10	14.5	L	4%	0.00037	3.74
			Floating Head Pressure Control	52.20%	40%	30%	10	14.5	L	4%	0.00037	2.17

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Warehouse	Retrofit	Comp./Data Ctr.	Energy Efficient Data Centers (virtualiz., cooling, and power supply	0.08%	20%	45%	10	2.0	H	8%	0.00029	2.13
			Power Management Software	0.15%	45%	15%	10	5.0	M	5%	0.00029	2.26
		Cooking	HE Ventilation Hoods	0.05%	15%	60%	10	1.5	M	5%	0.00000	0.00
		DHW	DHW Fuel Switching (elec to gas)	0.33%	20%	100%	10	25.0	L	1%	0.00028	5.27
			Faucet Aerators	0.10%	40%	1%	5	2.5	M	5%	0.00028	4.50
			Grey Water Heat Exchanger	0.66%	8%	5%	10	25.0	L	1%	0.00028	1.80
			Heat Trap	0.66%	60%	5%	10	25.0	M	5%	0.00028	0.39
			Insulating Blankets	0.66%	65%	4%	5	25.0	M	5%	0.00028	1.64
			Low Flow Pre-Rinse Nozzles	0.10%	45%	55%	5	2.5	M	5%	0.00028	12.24
			Low Flow Showerhead	0.10%	15%	0%	10	2.5	M	5%	0.00000	0.00
			Pipe Insulation	0.07%	25%	1%	5	2.5	M	5%	0.00028	0.43
			Pool Cover	0.18%	5%	60%	5	5.0	M	5%	0.00028	1.25
			Reduced Temperature Setpoints	0.66%	50%	19%	10	25.0	O	3%	0.00028	5.57
			Timers	0.66%	60%	5%	10	25.0	O	3%	0.00028	0.94
			Ultrasonic Faucet Control	0.09%	5%	3%	10	2.5	M	5%	0.00028	1.22
			Water Heater Cycling	0.66%	60%	5%	10	25.0	O	3%	0.00028	0.94
		HVAC	Chilled Water Free Cooling Controls and Equipments	0.90%	68%	15%	20	25.0	M	5%	0.00254	1.82
			Chilled Water Reset, Optimizer for Chiller(s)	0.90%	25%	5%	10	25.0	M	5%	0.00254	2.51
			Desiccant Dehumidification	5.00%	5%	5%	15	250.5	L	1%	0.00254	0.34
			Energy Management System	9.38%	10%	11%	15	313.1	O	3%	0.00254	1.14
			Fuel Switching (elec to gas)	0.75%	0%	100%	20	37.6	M	5%	0.00000	1.43
			Guest room contls	0.00%	0%	0%	10	5.5	M	5%	0.00000	0.00
			HE Chillers (air and water cooled)	0.90%	60%	15%	23	25.0	H	8%	0.00254	3.27
			HE Motors (VSDs, ECMs, on fans)	10.00%	35%	2%	10	250.5	O	8%	0.00254	6.41
			HE Rooftop AC systems	0.53%	10%	8%	15	14.8	M	5%	0.00254	8.31
			HVAC System maintenance (service buy-down)	12.50%	20%	8%	2	313.1	O	3%	0.00254	3.60
			HVAC System Retrocommissioning	12.50%	0%	15%	10	313.1	O	3%	0.00254	3.55
			Improve Duct Sealing	12.50%	15%	1%	10	313.1	O	3%	0.00254	5.87
			Insulate Pipes/Lines	12.50%	20%	1%	10	313.1	O	3%	0.00254	1.16
			Programmable Thermostat	3.13%	52%	4%	10	313.1	O	3%	0.00254	2.01
			Shell: Insulating and Air Sealing	9.38%	33%	12%	15	313.1	L	1%	0.00239	1.32
			Shell: Reduced Solar Gain	8.25%	25%	3%	15	313.1	M	5%	0.00239	0.16
			Time Clock	12.50%	95%	4%	10	313.1	O	3%	0.00254	2.01
			Ultraviolet A/C Coil Cleaning System	0.14%	25%	4%	20	4.0	M	5%	0.00254	1.04
		Lighting	Advanced Metal Halide	1.44%	15%	30%	10	36.1	O	6%	0.00029	2.77
			Bi-level stairwell lighting	0.21%	20%	50%	10	6.0	M	5%	0.00029	5.93
			CFL Screw in	0.54%	40%	71%	6	18.0	O	5%	0.00029	4.99
			Daylighting controls	0.30%	10%	20%	15	75.1	O	4%	0.00029	0.64
			Electronic ballast	7.29%	90%	30%	10	182.5	O	6%	0.00029	0.75
			Exterior light timers	0.59%	95%	25%	10	14.8	O	8%	0.00029	12.90
			HE Halogen	0.54%	1%	30%	10	18.0	M	5%	0.00029	9.85
			HO T5 lamps	1.08%	60%	45%	10	36.1	O	6%	0.00029	2.57
			HPT8 Fixture to replace T12	8.03%	30%	28%	10	201.2	O	6%	0.00029	1.61
			Induction	0.53%	5%	10%	10	14.8	O	6%	0.00029	2.45

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Warehouse	Retrofit	Lighting	LED Exit Lights	0.11%	60%	75%	10	2.7	H	8%	0.00029	1.27
			LED Exterior Lighting	0.44%	1%	90%	10	14.8	M	5%	0.00029	0.47
			LED Traffic lights	0.00%	1%	90%	10	0.0	M	5%	0.00029	0.40
			Occupancy Sensor	15.84%	22%	18%	10	396.8	O	8%	0.00029	5.40
			Scheduled interior lighting	15.84%	50%	10%	21	396.8	M	5%	0.00029	10.60
			Upgrade Ellipsoidal Reflector Lamps	0.01%	80%	30%	10	0.2	O	6%	0.00029	2.26
		Plug load	HE Battery Charging Station	0.02%	10%	35%	10	0.5	M	5%	0.00029	2.13
			Plug Load Sensors	0.90%	70%	20%	10	22.5	L	1%	0.00029	2.74
			TOD Pool Pump Timer	0.20%	5%	10%	5	5.0	M	5%	0.00028	3.84
			Vendor Miser	0.01%	30%	46%	10	0.2	M	5%	0.00029	2.35
		Refrig	Air Curtain Technologies	26.10%	10%	4%	10	726.4	L	1%	0.00037	2.30
			Ambient Sub-Cooling - oversized condenser	52.20%	10%	5%	10	1452.8	O	1%	0.00037	0.79
			Condensate Evaporator	52.20%	10%	5%	10	1452.8	L	1%	0.00037	2.80
			Cooler/Freezer Door Auto Closers	4.35%	25%	4%	5	726.4	H	8%	0.00037	3.14
			Cooler/Freezer Door Gaskets	11.60%	25%	2%	5	726.4	H	8%	0.00037	2.57
			Cycle fan off with thermostat; duty cycle occasionally when off	17.40%	25%	5%	5	1452.8	M	5%	0.00037	6.64
			Defrost Control System	52.20%	55%	3%	10	1452.8	L	1%	0.00037	1.82
			Economizer for Coolers	21.75%	20%	20%	15	726.4	L	1%	0.00037	4.48
			Evaporative Cooling	52.20%	10%	5%	10	1452.8	L	1%	0.00037	2.80
			Evaporator Fan Controller	1.04%	10%	30%	10	29.1	L	1%	0.00037	10.47
			Floating Head Pressure Control	52.20%	25%	30%	10	1452.8	L	1%	0.00037	2.92
			HE Compressors	52.20%	12%	8%	15	1452.8	O	3%	0.00037	1.34
			Insulated Suction Lines	52.20%	10%	1%	10	1452.8	L	1%	0.00037	0.62
			Liquid Pressure Amplifiers	52.20%	100%	5%	10	1452.8	O	1%	0.00037	2.88
			Mechanical Subcooling - additional subcooled compressor, valve,	52.20%	100%	5%	10	1452.8	L	1%	0.00037	2.23
			Parallel Rack Systems	52.20%	100%	5%	10	1452.8	L	1%	0.00037	2.80
			Refrigeration E-Cube	52.20%	5%	2%	10	1452.8	O	7%	0.00037	1.09
			Refrigeration System Maintenance	52.20%	8%	5%	10	1452.8	O	7%	0.00037	2.80
			Strip Curtains	5.80%	22%	4%	5	726.4	O	10%	0.00037	3.14
			VSD on Refrigeration Circulating Pump	0.87%	10%	30%	10	29.1	H	8%	0.00037	0.72
			VSD on Refrigeration Fan	0.87%	10%	30%	10	29.1	H	8%	0.00037	1.39
		Refrig - Display	Anti-sweat heater controls	5.74%	20%	6%	10	20.0	O	10%	0.00037	2.66
			Case Lights-off timer (12am and 6am)	5.74%	25%	25%	2	20.0	M	5%	0.00037	16.15
			New case doors	5.74%	8%	20%	12	20.0	O	10%	0.00037	3.14
			Night Covers for Display Cases	5.74%	20%	6%	5	20.0	H	8%	0.00037	1.10
			Refrigerated Case Doors - Door Misers	5.74%	0%	10%	5	20.0	H	8%	0.00037	3.14
			Refrigerated Case Doors - Low/No Anti-Sweat Heat	5.74%	31%	3%	12	20.0	O	10%	0.00037	9.69

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Effective Load Reduction Factor	TRC Ratio
Warehouse	ROB	Comp./Data Ctr.	HE (ES) Computers	0.20%	75%	25%	10	0.8	M	13%	0.00029	1.92
		Cooking	Connectionless (Boilerless) Steamers	0.02%	25%	50%	10	0.1	L	4%	0.00000	0.00
			HE (ES) Fryers	0.02%	25%	15%	10	0.1	L	4%	0.00000	0.00
			HE (ES) Hot Food Holding Cabinets	0.04%	25%	60%	10	0.1	L	4%	0.00000	0.00
			HE (ES) Steam Cookers / Steamers	0.02%	25%	50%	10	0.1	L	4%	0.00000	0.00
			HE Broilers	0.02%	40%	18%	10	0.1	L	4%	0.00000	0.00
			HE Griddles	0.02%	40%	32%	10	0.1	L	4%	0.00000	0.00
			HE Induction Cooking	0.02%	25%	0%	10	0.1	L	4%	0.00000	0.00
			HE Ovens	0.02%	20%	2%	10	0.1	L	4%	0.00029	0.08
			Solid State Temperature Controls	0.00%	15%	15%	10	0.0	M	13%	0.00029	0.28
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	0.03%	5%	65%	10	0.1	L	4%	0.00000	0.00
			HE Clothes Washers	0.30%	20%	35%	10	0.8	M	13%	0.00028	3.50
			HE Dishwashers	0.30%	20%	25%	10	0.8	M	13%	0.00028	1.39
			HE Water Heaters	0.66%	18%	5%	10	2.8	M	13%	0.00028	0.97
			Heat Pump Water Heating	3.56%	5%	59%	10	14.9	M	13%	0.00028	1.44
		HVAC	HE Chillers (air and water cooled)	0.90%	33%	25%	23	1.3	H	25%	0.00254	2.37
			HE Heat Pumps, including geothermal	0.15%	5%	36%	21	0.3	O	25%	0.00254	0.71
				0.25%	33%	8%	20	1.5	M	13%	0.00000	3.03
			HE Packaged AC (non rooftop)	0.71%	25%	16%	15	1.8	O	25%	0.00254	5.50
			HE Rooftop AC systems	0.71%	10%	17%	15	1.8	O	25%	0.00254	5.95
			PTAC and PTHP	0.20%	15%	30%	15	0.4	O	25%	0.00254	1.15
		Lighting	CFL Screw in	0.54%	40%	71%	6	9.2	M	13%	0.00029	4.99
			HPT8 Fixture to replace T8	8.55%	20%	11%	10	23.6	O	6%	0.00029	0.61
			LED Refrigerated Case Door Lighting	0.00%	0%	25%	20	0.0	H	25%	0.00029	3.38
			LED Task Lighting	0.65%	1%	35%	20	2.0	M	13%	0.00029	0.36
		Plug load	HE (ES) Icemakers	0.40%	25%	25%	10	1.1	L	4%	0.00029	0.75
			HE (ES) Other Office Equipment	0.20%	25%	25%	10	0.6	M	13%	0.00029	0.82
			HE (ES) Refrig. Bev. Vending Machines	0.01%	30%	20%	10	0.0	M	13%	0.00029	1.20
			HE (ES) Water Cooler	0.02%	25%	15%	10	0.1	M	13%	0.00029	0.45
			HE Commercial Clothes Dryers	0.10%	20%	10%	10	0.3	M	13%	0.00000	0.00
			HE Commercial Clothes Washers	0.10%	43%	35%	10	0.3	M	13%	0.00000	0.00
			Low Pressure Drop Pool Filter	0.18%	5%	5%	1	5.1	M	13%	0.00028	0.59
		Refrig	ECM Motors on fans	52.20%	51%	7%	15	111.4	O	7%	0.00037	3.65
			Evaporative Cooling	52.20%	10%	5%	10	159.8	L	4%	0.00037	2.80
			HE Compressors	52.20%	12%	8%	15	111.4	O	20%	0.00037	7.60
			PSC Motors on fans	52.20%	31%	4%	15	111.4	O	7%	0.00037	2.35

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Education	NC	DHW	Grey Water Heat Exchanger	16%	8%	30%	10	28	M	13%	10.98
			HE Water Heaters	22%	18%	15%	10	28	H	25%	5.22
			HE Water Heating System Design	22%	5%	5%	15	28	M	13%	3.86
		HVAC - Gas Heat	Combination Water Heater/Furnace	10%	1%	14%	15	18	L	4%	3.05
			Heat Recovery: Air to Air	15%	28%	40%	15	26	M	13%	4.92
			Improved Roof/Ceiling Insulation	60%	50%	4%	20	79	M	13%	2.50
			Micro Channel Heat Exchangers	27%	0%	5%	15	35	M	13%	2.68
			Radiant floor heating	4%	5%	12%	15	35	M	13%	2.19
			Solar ventilation pre-heat	2%	0%	15%	15	26	L	4%	2.68
	Retrofit	Cooking	HE Ventilation Hoods	1%	15%	60%	10	256	M	5%	3.76
		DHW	Faucet Aerators	2%	40%	3%	5	284	M	5%	18.26
			Grey Water Heat Exchanger	16%	8%	30%	10	2835	L	1%	1.10
			Heat Trap	22%	35%	5%	10	2835	M	5%	6.47
			Insulating Blankets	22%	65%	4%	5	2835	M	5%	10.11
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	284	H	8%	25.84
			Low Flow Showerhead	2%	15%	1%	10	284	H	8%	11.54
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	284	L	1%	2.66
			Pipe Insulation	22%	25%	1%	5	2835	M	5%	3.40
			Reduced Temperature Setpoints	16%	85%	6%	10	2835	O	3%	11.54
			Timers	22%	40%	5%	10	2835	O	3%	6.47
			Ultrasonic Faucet Control	2%	25%	3%	10	284	M	5%	7.91
			Wastewater Reclamation	2%	5%	40%	15	284	L	1%	1.71
			Water Heater Cycling	22%	40%	5%	10	2835	O	3%	6.47
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	11%	10%	15%	15	1654	L	1%	3.26
			Boiler - Steam System Isolation	5%	10%	15%	20	788	L	1%	2.05
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	788	M	5%	4.15
			Boiler Blowdown Heat Exchanger	9%	10%	4%	15	1654	L	1%	0.59
			Boiler Controls / Cx and RCx	13%	60%	15%	15	1654	O	3%	2.07
			HE Boilers	6%	49%	25%	15	1654	H	8%	1.07
			Heat Recovery: Air to Air	5%	28%	40%	15	2599	M	5%	1.45
			Heating Stack Economizer	9%	40%	4%	15	1654	M	5%	2.19
			Improved Roof/Ceiling Insulation	40%	25%	5%	20	7875	L	1%	0.58
			Insulate Pipes/Lines	60%	10%	3%	5	7875	O	3%	2.85
			Solar ventilation pre-heat	2%	0%	15%	15	2599	L	1%	2.68
			Steam Trap Maintenance	6%	30%	17%	2	788	O	3%	3.30
		Pool	Pool Cover	2%	50%	60%	10	315	L	1%	10.51
			TOD Pool Pump Timer	2%	30%	10%	5	315	L	1%	19.13

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Education	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	50%	10	9	L	4%	12.63
			HE (ES) Fryers	1%	25%	15%	10	9	M	13%	5.72
			HE (ES) Hot Food Holding Cabinets	1%	25%	7%	10	19	L	4%	3.02
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	9	L	4%	2.23
			HE Broilers	1%	40%	19%	10	9	L	4%	10.72
			HE Griddles	1%	40%	6%	10	9	L	4%	2.43
			HE Ovens	1%	30%	66%	10	9	M	13%	11.12
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	31	L	4%	11.02
			HE Clothes Washers	6%	20%	5%	10	94	M	13%	4.70
			HE Dishwashers	6%	20%	25%	10	94	M	13%	9.26
			HE Water Heaters	22%	18%	25%	15	312	M	13%	7.74
			Heat Pump Water Heating	2%	5%	100%	15	312	L	4%	5.36
		HVAC - Gas Heat	HE Boilers	6%	49%	15%	15	127	M	13%	5.45
			HE Furnaces (<=300kBTU)	12%	45%	19%	15	136	M	13%	4.62
			HE Unit Heaters and Radiant heaters	11%	50%	6%	10	156	M	13%	2.55
		Pool	HE Gas Pool Water Heater	2%	30%	25%	10	35	M	13%	12.63
Food Sales	NC	DHW	Grey Water Heat Exchanger	17%	8%	30%	10	4	M	13%	16.08
			HE Water Heaters	23%	18%	15%	10	4	H	25%	9.27
			HE Water Heating System Design	23%	5%	5%	15	4	M	13%	7.09
		HVAC - Gas Heat	Combination Water Heater/Furnace	9%	1%	14%	15	2	L	4%	5.80
			Heat Recovery: Air to Air	14%	28%	40%	15	3	M	13%	2.04
			Improved Roof/Ceiling Insulation	56%	50%	4%	20	10	M	13%	1.62
			Micro Channel Heat Exchangers	25%	0%	5%	15	4	M	13%	5.19
			Radiant floor heating	4%	5%	12%	15	4	M	13%	4.34
			Solar ventilation pre-heat	2%	0%	15%	15	3	L	4%	5.19
	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	60%	10	45	M	5%	7.05
		DHW	Faucet Aerators	2%	40%	1%	5	39	M	5%	23.03
			Grey Water Heat Exchanger	17%	8%	30%	10	394	L	1%	2.30
			Heat Trap	23%	35%	5%	10	394	M	5%	10.98
			Insulating Blankets	23%	65%	4%	5	394	M	5%	15.75
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	39	H	8%	27.69
			Low Flow Showerhead	2%	15%	1%	10	39	H	8%	16.62
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	39	L	1%	5.15
			Pipe Insulation	23%	25%	1%	5	394	M	5%	6.57
			Reduced Temperature Setpoints	17%	50%	6%	10	394	O	3%	16.62
			Timers	23%	40%	5%	10	394	O	3%	10.98
			Ultrasonic Faucet Control	2%	5%	3%	10	39	M	5%	12.78
			Wastewater Reclamation	2%	5%	40%	15	39	L	1%	3.46
			Water Heater Cycling	23%	40%	5%	10	394	O	3%	10.98

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Sales	Retrofit	HVAC - Gas Heat	Boiler - Automatic Chemical feed	11%	10%	15%	15	206	L	1%	6.14
			Boiler - Steam System Isolation	5%	10%	15%	20	98	L	1%	4.04
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	98	M	5%	7.54
			Boiler Blowdown Heat Exchanger	9%	10%	4%	15	206	L	1%	1.26
			Boiler Controls / Cx and RCx	12%	20%	15%	15	206	O	3%	2.26
			HE Boilers	6%	49%	25%	15	206	M	5%	1.41
			Heat Recovery: Air to Air	5%	28%	40%	15	323	M	5%	0.80
			Heating Stack Economizer	9%	10%	4%	15	206	M	5%	4.34
			Improved Roof/Ceiling Insulation	37%	25%	5%	20	980	L	1%	1.06
			Insulate Pipes/Lines	56%	10%	3%	5	980	O	3%	5.61
			Solar ventilation pre-heat	2%	0%	15%	15	323	L	1%	5.19
			Steam Trap Maintenance	6%	30%	17%	2	98	O	3%	5.61
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	15.62
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	23.65
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	50%	10	2	L	4%	17.62
			HE (ES) Fryers	1%	25%	15%	10	2	M	13%	9.97
			HE (ES) Hot Food Holding Cabinets	2%	25%	7%	10	3	L	4%	5.83
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	2	L	4%	4.45
			HE Broilers	1%	40%	19%	10	2	L	4%	11.33
			HE Griddles	1%	40%	6%	10	2	L	4%	4.81
			HE Ovens	1%	20%	66%	10	2	M	13%	16.22
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	4	L	4%	16.12
			HE Clothes Washers	7%	20%	7%	10	13	M	13%	8.50
			HE Dishwashers	7%	20%	3%	10	13	M	13%	14.31
			HE Water Heaters	23%	18%	25%	15	43	M	13%	12.21
			Heat Pump Water Heating	2%	5%	100%	15	43	L	4%	7.26
		HVAC - Gas Heat	HE Boilers	6%	49%	15%	15	16	M	13%	9.86
			HE Furnaces (<=300kBTU)	11%	45%	19%	15	17	M	13%	8.22
			HE Unit Heaters and Radiant heaters	10%	50%	6%	10	19	M	13%	2.81
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	17.62
Food Servic	NC	DHW	Grey Water Heat Exchanger	18%	8%	25%	10	13	M	13%	15.48
			HE Water Heaters	24%	18%	15%	10	13	H	25%	8.71
			HE Water Heating System Design	24%	5%	5%	15	13	M	13%	6.63
		HVAC - Gas Heat	Combination Water Heater/Furnace	6%	1%	14%	15	4	L	4%	5.39
			Heat Recovery: Air to Air	8%	13%	40%	15	6	M	13%	1.93
			Improved Roof/Ceiling Insulation	34%	50%	4%	20	18	M	13%	1.19
			Micro Channel Heat Exchangers	15%	0%	5%	15	8	M	13%	4.81
			Radiant floor heating	2%	5%	12%	15	8	M	13%	4.01
			Solar ventilation pre-heat	1%	0%	15%	15	6	L	4%	4.81

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	Retrofit	Cooking	HE Ventilation Hoods	4%	15%	60%	10	291	M	5%	6.57
		DHW	Faucet Aerators	2%	40%	1%	5	128	M	5%	22.54
			Grey Water Heat Exchanger	18%	8%	25%	10	1276	L	1%	2.10
			Heat Trap	24%	35%	5%	10	1276	M	5%	10.38
			Insulating Blankets	24%	65%	4%	5	1276	M	5%	15.05
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	128	H	8%	27.53
			Low Flow Showerhead	2%	15%	1%	10	128	H	8%	16.03
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	128	L	1%	4.78
			Pipe Insulation	24%	25%	1%	5	1276	M	5%	6.10
			Reduced Temperature Setpoints	18%	50%	6%	10	1276	O	3%	16.03
			Timers	24%	40%	5%	10	1276	O	3%	10.38
			Ultrasonic Faucet Control	2%	25%	3%	10	128	M	5%	12.16
			Wastewater Reclamation	2%	5%	40%	15	128	L	1%	3.19
			Water Heater Cycling	24%	40%	5%	10	1276	O	3%	10.38
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	6%	10%	15%	15	375	L	1%	5.72
			Boiler - Steam System Isolation	3%	10%	15%	20	179	L	1%	3.74
			Boiler - Steam to Hot Water Conversion	2%	10%	10%	15	179	M	5%	7.06
			Boiler Blowdown Heat Exchanger	5%	10%	4%	15	375	L	1%	1.15
			Boiler Controls / Cx and RCx	7%	20%	15%	15	375	O	3%	2.07
			HE Boilers	4%	49%	25%	15	375	M	5%	1.29
			Heat Recovery: Air to Air	3%	13%	40%	15	589	M	5%	0.81
			Heating Stack Economizer	5%	10%	4%	15	375	M	5%	4.01
			Improved Roof/Ceiling Insulation	22%	25%	5%	20	1785	L	1%	0.77
			Insulate Pipes/Lines	34%	20%	3%	5	1785	O	3%	5.19
			Solar ventilation pre-heat	1%	0%	15%	15	589	L	1%	4.81
			Steam Trap Maintenance	3%	30%	17%	2	179	O	3%	5.97
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	15.01
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	23.19
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	50%	10	11	L	4%	17.06
			HE (ES) Fryers	2%	25%	15%	10	11	M	13%	9.39
			HE (ES) Hot Food Holding Cabinets	4%	25%	7%	10	21	L	4%	5.41
			HE (ES) Steam Cookers / Steamers	2%	25%	5%	10	11	L	4%	4.11
			HE Broilers	2%	25%	19%	10	11	L	4%	15.22
			HE Griddles	2%	25%	6%	10	11	L	4%	4.45
			HE Ovens	2%	12%	66%	10	11	M	13%	15.62
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	14	L	4%	15.53
			HE Clothes Washers	7%	20%	35%	10	42	M	13%	7.97
			HE Dishwashers	7%	20%	25%	10	42	M	13%	13.69
			HE Water Heaters	24%	18%	25%	15	140	M	13%	11.65
			Heat Pump Water Heating	2%	5%	100%	15	140	L	4%	7.17

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	ROB	HVAC - Gas Heat	HE Boilers	4%	49%	15%	15	29	M	13%	8.84
			HE Furnaces (<=300kBTU)	7%	45%	19%	15	31	M	13%	7.72
			HE Unit Heaters and Radiant heaters	6%	50%	6%	10	35	M	13%	2.60
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	17.06
Health Care	NC	DHW	Grey Water Heat Exchanger	25%	8%	30%	10	26	M	13%	18.47
			HE Water Heaters	33%	18%	15%	10	26	H	25%	11.82
			HE Water Heating System Design	33%	5%	5%	15	26	M	13%	9.24
		HVAC - Gas Heat	Combination Water Heater/Furnace	8%	1%	14%	15	8	L	4%	2.57
			Heat Recovery: Air to Air	11%	28%	40%	15	12	M	13%	3.02
			Improved Roof/Ceiling Insulation	45%	50%	4%	20	35	M	13%	1.35
			Micro Channel Heat Exchangers	20%	0%	5%	15	16	M	13%	2.38
			Radiant floor heating	3%	5%	12%	15	16	M	13%	1.49
			Solar ventilation pre-heat	1%	0%	15%	15	12	L	4%	2.29
	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	60%	10	177	M	5%	9.33
		DHW	Faucet Aerators	3%	40%	4%	5	262	M	5%	24.83
			Grey Water Heat Exchanger	25%	8%	30%	10	2622	L	1%	3.30
			Heat Trap	33%	35%	5%	10	2622	M	5%	13.62
			Insulating Blankets	33%	65%	4%	5	2622	M	5%	18.64
			Low Flow Pre-Rinse Nozzles	3%	45%	55%	5	262	H	8%	28.25
			Low Flow Showerhead	3%	15%	1%	10	262	H	8%	18.94
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	262	L	1%	6.96
			Pipe Insulation	33%	25%	1%	5	2622	M	5%	8.87
			Reduced Temperature Setpoints	25%	25%	6%	10	2622	O	3%	18.94
			Timers	33%	40%	5%	10	2622	O	3%	13.62
			Ultrasonic Faucet Control	3%	10%	3%	10	262	M	5%	15.42
			Wastewater Reclamation	2%	5%	40%	15	262	L	1%	4.84
			Water Heater Cycling	33%	40%	5%	10	2622	O	3%	13.62
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	9%	10%	15%	15	744	L	1%	8.15
			Boiler - Steam System Isolation	4%	10%	15%	20	354	L	1%	4.24
			Boiler - Steam to Hot Water Conversion	2%	10%	10%	15	354	M	5%	9.74
			Boiler Blowdown Heat Exchanger	7%	10%	4%	15	744	L	1%	0.77
			Boiler Controls / Cx and RCx	9%	70%	15%	15	744	O	3%	3.23
			HE Boilers	5%	49%	25%	15	744	H	8%	2.05
			Heat Recovery: Air to Air	4%	28%	40%	15	1169	M	5%	1.48
			Heating Stack Economizer	7%	40%	4%	15	744	M	5%	5.96
			Improved Roof/Ceiling Insulation	30%	25%	5%	20	3544	L	1%	0.87
			Insulate Pipes/Lines	45%	10%	3%	5	3544	O	3%	2.05
			Solar ventilation pre-heat	1%	0%	15%	15	1169	L	1%	0.82
			Steam Trap Maintenance	5%	30%	17%	2	354	O	3%	5.61
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	18.06
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	25.31

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Health Care	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	50%	10	6	L	4%	19.79
			HE (ES) Fryers	1%	25%	15%	10	6	M	13%	12.57
			HE (ES) Hot Food Holding Cabinets	2%	25%	7%	10	13	L	4%	7.88
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	6	L	4%	6.15
			HE Broilers	1%	40%	19%	10	6	L	4%	13.98
			HE Griddles	1%	40%	6%	10	6	L	4%	6.61
			HE Ovens	1%	42%	66%	10	6	M	13%	18.59
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	29	L	4%	18.50
			HE Clothes Washers	10%	20%	35%	10	87	M	13%	10.98
			HE Dishwashers	10%	20%	25%	10	87	M	13%	16.87
			HE Water Heaters	33%	18%	25%	15	288	M	13%	14.54
			Heat Pump Water Heating	3%	5%	100%	15	288	L	4%	8.14
		HVAC - Gas Heat	HE Boilers	5%	49%	15%	15	57	M	13%	6.69
			HE Furnaces (<=300kBTU)	9%	45%	19%	15	61	M	13%	3.94
			HE Unit Heaters and Radiant heaters	8%	50%	6%	10	70	M	13%	2.14
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	19.79
Lodging	NC	DHW	Grey Water Heat Exchanger	23%	8%	30%	10	27	M	13%	18.47
			HE Water Heaters	31%	18%	15%	10	27	H	25%	11.82
			HE Water Heating System Design	31%	5%	5%	15	27	M	13%	9.24
		HVAC - Gas Heat	Combination Water Heater/Furnace	11%	1%	14%	15	12	L	4%	2.57
			Heat Recovery: Air to Air	16%	28%	40%	15	18	M	13%	3.02
			Improved Roof/Ceiling Insulation	63%	50%	4%	20	55	M	13%	3.09
			Micro Channel Heat Exchangers	28%	0%	5%	15	25	M	13%	2.26
			Radiant floor heating	4%	5%	12%	15	25	M	13%	1.84
			Solar ventilation pre-heat	2%	0%	15%	15	18	L	4%	2.26
	Retrofit	Cooking	HE Ventilation Hoods	1%	15%	60%	10	118	M	5%	9.33
		DHW	Faucet Aerators	3%	40%	2%	5	268	M	5%	24.83
			Grey Water Heat Exchanger	23%	8%	10%	10	2678	L	1%	3.30
			Heat Trap	31%	35%	5%	10	2678	M	5%	13.62
			Insulating Blankets	31%	65%	4%	5	2678	M	5%	18.64
			Low Flow Pre-Rinse Nozzles	3%	45%	55%	5	268	H	8%	28.25
			Low Flow Showerhead	3%	15%	9%	10	268	H	8%	18.94
			Ozone Commercial Laundry System (Gas HW)	2%	6%	65%	15	268	L	1%	6.96
			Pipe Insulation	31%	25%	1%	5	2678	M	5%	8.87
			Reduced Temperature Setpoints	23%	65%	6%	10	2678	O	3%	18.94
			Timers	31%	40%	5%	10	2678	O	3%	13.62
			Ultrasonic Faucet Control	3%	15%	3%	10	268	M	5%	15.42
			Wastewater Reclamation	2%	6%	40%	15	268	L	1%	4.84
			Water Heater Cycling	31%	40%	5%	10	2678	O	3%	13.62

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Lodging	Retrofit	HVAC - Gas Heat	Boiler - Automatic Chemical feed	12%	10%	15%	15	1158	L	1%	8.15
			Boiler - Steam System Isolation	6%	10%	15%	20	551	L	1%	4.24
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	551	M	5%	9.74
			Boiler Blowdown Heat Exchanger	10%	10%	4%	15	1158	L	1%	1.84
			Boiler Controls / Cx and RCx	13%	20%	15%	15	1158	O	3%	3.23
			HE Boilers	7%	49%	25%	15	1158	M	5%	2.05
			Heat Recovery: Air to Air	5%	28%	40%	15	1819	M	5%	1.48
			Heating Stack Economizer	10%	10%	4%	15	1158	M	5%	5.96
			Improved Roof/Ceiling Insulation	42%	25%	5%	20	5513	L	1%	2.07
			Insulate Pipes/Lines	63%	10%	3%	5	5513	O	3%	2.39
			Solar ventilation pre-heat	2%	0%	15%	15	1819	L	1%	2.26
			Steam Trap Maintenance	6%	55%	17%	2	551	O	3%	1.79
		Pool	Pool Cover	3%	20%	60%	10	298	L	1%	18.06
			TOD Pool Pump Timer	3%	30%	10%	5	298	L	1%	25.31
	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	50%	10	4	L	4%	19.79
			HE (ES) Fryers	0%	25%	15%	10	4	M	13%	12.57
			HE (ES) Hot Food Holding Cabinets	1%	25%	7%	10	9	L	4%	7.88
			HE (ES) Steam Cookers / Steamers	0%	25%	5%	10	4	L	4%	6.15
			HE Broilers	0%	25%	19%	10	4	L	4%	13.98
			HE Griddles	0%	40%	6%	10	4	L	4%	6.61
			HE Ovens	0%	43%	66%	10	4	M	13%	18.59
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	29	L	4%	18.50
			HE Clothes Washers	9%	20%	35%	10	88	M	13%	10.98
			HE Dishwashers	9%	20%	25%	10	88	M	13%	16.87
			HE Water Heaters	31%	18%	25%	15	295	M	13%	14.54
			Heat Pump Water Heating	3%	5%	100%	15	295	L	4%	8.23
		HVAC - Gas Heat	HE Boilers	7%	49%	15%	15	89	M	13%	3.41
			HE Furnaces (<=300kBTU)	13%	45%	19%	15	95	M	13%	3.94
			HE Unit Heaters and Radiant heaters	11%	50%	6%	10	109	M	13%	2.78
		Pool	HE Gas Pool Water Heater	3%	30%	25%	10	33	M	13%	19.79
Mercantile	NC	DHW	Grey Water Heat Exchanger	15%	8%	5%	10	21	M	13%	14.04
			HE Water Heaters	20%	18%	15%	10	21	H	25%	7.46
			HE Water Heating System Design	20%	5%	5%	15	21	M	13%	5.62
		HVAC - Gas Heat	Combination Water Heater/Furnace	10%	1%	14%	15	15	L	4%	4.52
			Heat Recovery: Air to Air	15%	28%	40%	15	21	M	13%	1.57
			Improved Roof/Ceiling Insulation	62%	50%	4%	20	65	M	13%	1.29
			Micro Channel Heat Exchangers	28%	0%	5%	15	29	M	13%	4.01
			Radiant floor heating	4%	5%	12%	15	29	M	13%	3.32
			Solar ventilation pre-heat	2%	0%	15%	15	21	L	4%	4.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Mercantile	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	60%	10	236	M	5%	5.54
		DHW	Faucet Aerators	2%	40%	2%	5	208	M	5%	21.29
			Grey Water Heat Exchanger	15%	8%	5%	10	2079	L	1%	1.71
			Heat Trap	20%	35%	5%	10	2079	M	5%	9.01
			Insulating Blankets	20%	65%	4%	5	2079	M	5%	13.41
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	208	H	8%	27.09
			Low Flow Showerhead	2%	15%	1%	10	208	H	8%	14.61
			Ozone Commercial Laundry System (Gas HW)	1%	5%	65%	15	208	L	1%	3.98
			Pipe Insulation	20%	25%	1%	5	2079	M	5%	5.09
			Reduced Temperature Setpoints	15%	50%	6%	10	2079	O	3%	14.61
			Timers	20%	40%	5%	10	2079	O	3%	9.01
			Ultrasonic Faucet Control	2%	15%	3%	10	208	M	5%	10.72
			Wastewater Reclamation	1%	5%	40%	15	208	L	1%	2.62
			Water Heater Cycling	20%	40%	5%	10	2079	O	3%	9.01
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	12%	10%	15%	15	1367	L	1%	4.81
			Boiler - Steam System Isolation	6%	10%	15%	20	651	L	1%	3.10
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	651	M	5%	6.00
			Boiler Blowdown Heat Exchanger	10%	10%	4%	15	1367	L	1%	0.93
			Boiler Controls / Cx and RCx	13%	20%	15%	15	1367	O	3%	1.68
			HE Boilers	7%	49%	25%	15	1367	M	5%	1.04
			Heat Recovery: Air to Air	5%	28%	40%	15	2148	M	5%	0.41
			Heating Stack Economizer	10%	10%	4%	15	1367	M	5%	3.32
			Improved Roof/Ceiling Insulation	41%	25%	5%	20	6510	L	1%	0.84
			Insulate Pipes/Lines	62%	10%	3%	5	6510	O	3%	4.31
			Solar ventilation pre-heat	2%	0%	15%	15	2148	L	1%	4.01
			Steam Trap Maintenance	6%	30%	17%	2	651	O	3%	4.97
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	13.56
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	22.02
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	50%	10	9	L	4%	15.69
			HE (ES) Fryers	1%	25%	15%	10	9	M	13%	8.09
			HE (ES) Hot Food Holding Cabinets	2%	25%	7%	10	17	L	4%	4.52
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	9	L	4%	3.39
			HE Broilers	1%	40%	19%	10	9	L	4%	13.78
			HE Griddles	1%	40%	6%	10	9	L	4%	3.68
			HE Ovens	1%	20%	66%	10	9	M	13%	14.19
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	1%	25%	65%	10	23	L	4%	14.09
			HE Clothes Washers	6%	20%	35%	10	69	M	13%	6.78
			HE Dishwashers	6%	20%	25%	10	69	M	13%	12.22
			HE Water Heaters	20%	18%	25%	15	229	M	13%	10.34
			Heat Pump Water Heating	2%	5%	100%	15	229	L	4%	6.39
		HVAC - Gas Heat	HE Boilers	7%	49%	15%	15	105	M	13%	7.65
			HE Furnaces (<=300kBTU)	13%	45%	19%	15	112	M	13%	6.61
			HE Unit Heaters and Radiant heaters	11%	50%	6%	10	129	M	13%	3.86
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	15.69

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	NC	DHW	Grey Water Heat Exchanger	18%	8%	10%	10	29	M	13%	11.59
			HE Water Heaters	23%	18%	15%	10	29	H	25%	5.63
			HE Water Heating System Design	23%	5%	5%	15	29	M	13%	4.17
		HVAC - Gas Heat	Combination Water Heater/Furnace	12%	1%	14%	15	20	L	4%	3.31
			Heat Recovery: Air to Air	18%	28%	40%	15	29	M	13%	2.03
			Improved Roof/Ceiling Insulation	72%	50%	4%	20	88	M	13%	1.13
			Micro Channel Heat Exchangers	32%	0%	5%	15	40	M	13%	2.91
			Radiant floor heating	5%	5%	12%	15	40	M	13%	2.39
			Solar ventilation pre-heat	2%	0%	15%	15	29	L	4%	2.91

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	Retrofit	Cooking	HE Ventilation Hoods	0%	15%	60%	10	0	M	5%	4.07
		DHW	Faucet Aerators	2%	40%	1%	5	287	M	5%	18.91
			Grey Water Heat Exchanger	18%	8%	10%	10	2867	L	1%	1.20
			Heat Trap	23%	35%	5%	10	2867	M	5%	6.94
			Insulating Blankets	23%	65%	4%	5	2867	M	5%	10.75
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	287	H	8%	26.13
			Low Flow Showerhead	2%	15%	1%	10	287	H	8%	12.16
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	287	L	1%	2.89
			Pipe Insulation	23%	25%	1%	5	2867	M	5%	3.70
			Reduced Temperature Setpoints	18%	65%	6%	10	2867	O	3%	12.16
			Timers	23%	40%	5%	10	2867	O	3%	6.94
			Ultrasonic Faucet Control	2%	15%	3%	10	287	M	5%	8.45
			Wastewater Reclamation	2%	5%	40%	15	287	L	1%	1.87
			Water Heater Cycling	23%	40%	5%	10	2867	O	3%	6.94
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	14%	10%	15%	15	1852	L	1%	3.53
			Boiler - Steam System Isolation	6%	10%	15%	20	882	L	1%	2.23
			Boiler - Steam to Hot Water Conversion	4%	10%	10%	15	882	M	5%	4.49
			Boiler Blowdown Heat Exchanger	11%	10%	4%	15	1852	L	1%	0.65
			Boiler Controls / Cx and RCx	15%	30%	15%	15	1852	O	3%	2.26
			HE Boilers	8%	49%	25%	15	1852	M	5%	1.07
			Heat Recovery: Air to Air	6%	28%	40%	15	2911	M	5%	0.54
			Heating Stack Economizer	11%	10%	4%	15	1852	M	5%	2.39
			Improved Roof/Ceiling Insulation	48%	25%	5%	20	8820	L	1%	0.25
			Insulate Pipes/Lines	72%	10%	3%	5	8820	O	3%	3.10
			Solar ventilation pre-heat	2%	0%	15%	15	2911	L	1%	2.91
			Steam Trap Maintenance	7%	30%	17%	2	882	O	3%	3.59
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	11.12
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	19.76
	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	50%	10	0	L	4%	13.26
			HE (ES) Fryers	0%	25%	15%	10	0	M	13%	6.15
			HE (ES) Hot Food Holding Cabinets	0%	25%	7%	10	0	L	4%	3.28
			HE (ES) Steam Cookers / Steamers	0%	25%	5%	10	0	L	4%	2.43
			HE Broilers	0%	40%	19%	10	0	L	4%	11.33
			HE Griddles	0%	40%	6%	10	0	L	4%	2.65
			HE Ovens	0%	20%	66%	10	0	M	13%	11.73
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	32	L	4%	11.64
			HE Clothes Washers	7%	20%	35%	10	95	M	13%	5.07
			HE Dishwashers	7%	75%	25%	10	95	M	13%	9.83
			HE Water Heaters	23%	18%	25%	15	315	M	13%	8.24
			Heat Pump Water Heating	2%	5%	100%	15	315	L	4%	5.43
		HVAC - Gas Heat	HE Boilers	8%	49%	15%	15	142	M	13%	5.85
			HE Furnaces (<=300kBTU)	15%	45%	19%	15	152	M	13%	4.98
			HE Unit Heaters and Radiant heaters	13%	50%	6%	10	175	M	13%	2.78
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	13.26

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other (incl. L	NC	DHW	Grey Water Heat Exchanger	20%	8%	5%	10	9	M	13%	14.04
			HE Water Heaters	26%	18%	15%	10	9	H	25%	7.46
			HE Water Heating System Design	26%	5%	5%	15	9	M	13%	5.62
		HVAC - Gas Heat	Combination Water Heater/Furnace	8%	1%	14%	15	4	L	4%	4.52
			Heat Recovery: Air to Air	12%	13%	40%	15	6	M	13%	1.57
			Improved Roof/Ceiling Insulation	48%	50%	4%	20	17	M	13%	4.21
			Micro Channel Heat Exchangers	22%	0%	5%	15	8	M	13%	4.01
			Radiant floor heating	3%	5%	12%	15	8	M	13%	3.32
			Solar ventilation pre-heat	2%	0%	15%	15	6	L	4%	4.01
	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	0%	10	105	M	5%	0.00
		DHW	Faucet Aerators	3%	40%	1%	5	91	M	5%	21.29
			Grey Water Heat Exchanger	20%	8%	5%	10	914	L	1%	1.71
			Heat Trap	26%	35%	5%	10	914	M	5%	9.01
			Insulating Blankets	26%	65%	4%	5	914	M	5%	13.41
			Low Flow Pre-Rinse Nozzles	3%	45%	55%	5	91	H	8%	27.09
			Low Flow Showerhead	3%	15%	1%	10	91	H	8%	14.61
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	91	L	1%	3.98
			Pipe Insulation	26%	25%	1%	5	914	M	5%	5.09
			Reduced Temperature Setpoints	20%	65%	6%	10	914	O	3%	14.61
			Timers	26%	40%	5%	10	914	O	3%	9.01
			Ultrasonic Faucet Control	3%	5%	3%	10	91	M	5%	10.72
			Wastewater Reclamation	2%	5%	40%	15	91	L	1%	2.62
			Water Heater Cycling	26%	40%	5%	10	914	O	3%	9.01
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	9%	10%	15%	15	353	L	1%	4.81
			Boiler - Steam System Isolation	4%	10%	15%	20	168	L	1%	3.10
			Boiler - Steam to Hot Water Conversion	2%	10%	10%	15	168	M	5%	6.00
			Boiler Blowdown Heat Exchanger	8%	10%	4%	15	353	L	1%	0.93
			Boiler Controls / Cx and RCx	10%	20%	15%	15	353	O	3%	1.68
			HE Boilers	5%	49%	25%	15	353	M	5%	1.04
			Heat Recovery: Air to Air	4%	13%	40%	15	554	M	5%	0.41
			Heating Stack Economizer	8%	10%	4%	15	353	M	5%	3.32
			Improved Roof/Ceiling Insulation	32%	25%	5%	20	1680	L	1%	2.88
			Insulate Pipes/Lines	48%	10%	3%	5	1680	O	3%	4.31
			Solar ventilation pre-heat	2%	0%	15%	15	554	L	1%	4.01
			Steam Trap Maintenance	5%	30%	17%	2	168	O	3%	4.97
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	13.56
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	22.02
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	50%	10	4	L	4%	15.69
			HE (ES) Fryers	1%	25%	0%	10	4	M	13%	0.00
			HE (ES) Hot Food Holding Cabinets	2%	25%	0%	10	8	L	4%	0.00
			HE (ES) Steam Cookers / Steamers	1%	25%	0%	10	4	L	4%	0.00
			HE Broilers	1%	25%	19%	10	4	L	4%	13.78
			HE Griddles	1%	40%	6%	10	4	L	4%	3.68
			HE Ovens	1%	12%	66%	10	4	M	13%	14.19

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other (incl. L	ROB	DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	65%	10	10	L	4%	14.09
			HE Clothes Washers	8%	20%	35%	10	30	M	13%	6.78
			HE Dishwashers	8%	20%	25%	10	30	M	13%	12.22
			HE Water Heaters	26%	18%	25%	15	100	M	13%	10.34
			Heat Pump Water Heating	3%	5%	100%	15	100	L	4%	6.43
		HVAC - Gas Heat	HE Boilers	5%	49%	15%	15	27	M	13%	7.65
			HE Furnaces (<=300kBTU)	10%	45%	19%	15	29	M	13%	6.61
			HE Unit Heaters and Radiant heaters	9%	50%	6%	10	33	M	13%	3.86
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	15.69
Public Asser	NC	DHW	Grey Water Heat Exchanger	16%	8%	5%	10	11	M	13%	10.98
			HE Water Heaters	22%	18%	15%	10	11	H	25%	5.22
			HE Water Heating System Design	22%	5%	5%	15	11	M	13%	3.86
		HVAC - Gas Heat	Combination Water Heater/Furnace	10%	1%	14%	15	7	L	4%	3.05
			Heat Recovery: Air to Air	15%	28%	40%	15	10	M	13%	4.91
			Improved Roof/Ceiling Insulation	60%	50%	4%	20	32	M	13%	1.76
			Micro Channel Heat Exchangers	27%	0%	5%	15	14	M	13%	2.68
			Radiant floor heating	4%	5%	12%	15	14	M	13%	2.19
			Solar ventilation pre-heat	2%	0%	15%	15	10	L	4%	2.68
	Retrofit	Cooking	HE Ventilation Hoods	1%	15%	60%	10	102	M	5%	3.76
		DHW	Faucet Aerators	2%	40%	1%	5	113	M	5%	18.26
			Grey Water Heat Exchanger	16%	8%	5%	10	1134	L	1%	1.10
			Heat Trap	22%	35%	5%	10	1134	M	5%	6.47
			Insulating Blankets	22%	65%	4%	5	1134	M	5%	10.11
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	113	H	8%	25.84
			Low Flow Showerhead	2%	15%	1%	10	113	H	8%	11.54
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	113	L	1%	2.66
			Pipe Insulation	22%	25%	1%	5	1134	M	5%	3.40
			Reduced Temperature Setpoints	16%	50%	6%	10	1134	O	3%	11.54
			Timers	22%	40%	5%	10	1134	O	3%	6.47
			Ultrasonic Faucet Control	2%	15%	3%	10	113	M	5%	7.91
			Wastewater Reclamation	2%	5%	40%	15	113	L	1%	1.71
			Water Heater Cycling	22%	40%	5%	10	1134	O	3%	6.47
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	11%	10%	15%	15	662	L	1%	3.26
			Boiler - Steam System Isolation	5%	10%	15%	20	315	L	1%	2.05
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	315	M	5%	4.15
			Boiler Blowdown Heat Exchanger	9%	10%	4%	15	662	L	1%	0.59
			Boiler Controls / Cx and RCx	13%	20%	15%	15	662	O	3%	2.07
			HE Boilers	6%	49%	25%	15	662	H	8%	1.07
			Heat Recovery: Air to Air	5%	28%	40%	15	1040	M	5%	1.45
			Heating Stack Economizer	9%	10%	4%	15	662	M	5%	2.19
			Improved Roof/Ceiling Insulation	40%	25%	5%	20	3150	L	1%	0.40
			Insulate Pipes/Lines	60%	10%	3%	5	3150	O	3%	2.85
			Solar ventilation pre-heat	2%	0%	15%	15	1040	L	1%	2.68
			Steam Trap Maintenance	6%	30%	17%	2	315	O	3%	3.30
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	10.51
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	19.13

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Asser	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	0%	10	4	L	4%	0.00
			HE (ES) Fryers	1%	25%	15%	10	4	M	13%	5.72
			HE (ES) Hot Food Holding Cabinets	1%	25%	7%	10	8	L	4%	3.02
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	4	L	4%	2.23
			HE Broilers	1%	40%	19%	10	4	L	4%	10.72
			HE Griddles	1%	40%	6%	10	4	L	4%	2.43
			HE Ovens	1%	20%	0%	10	4	M	13%	0.00
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	0%	10	12	L	4%	0.00
			HE Clothes Washers	6%	20%	35%	10	37	M	13%	4.70
			HE Dishwashers	6%	20%	25%	10	37	M	13%	9.26
			HE Water Heaters	22%	18%	25%	15	125	M	13%	7.74
			Heat Pump Water Heating	2%	5%	100%	15	125	L	4%	5.22
		HVAC - Gas Heat	HE Boilers	6%	49%	15%	15	51	M	13%	5.45
			HE Furnaces (<=300kBTU)	12%	45%	19%	15	54	M	13%	4.62
			HE Unit Heaters and Radiant heaters	11%	50%	6%	10	62	M	13%	2.55
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	12.63
Public Order	NC	DHW	Grey Water Heat Exchanger	20%	8%	5%	10	2	M	13%	10.38
			HE Water Heaters	26%	18%	15%	10	2	H	25%	9.01
			HE Water Heating System Design	26%	5%	5%	15	2	M	13%	3.86
		HVAC - Gas Heat	Combination Water Heater/Furnace	8%	1%	14%	15	1	L	4%	3.05
			Heat Recovery: Air to Air	12%	28%	40%	15	1	M	13%	4.91
			Improved Roof/Ceiling Insulation	48%	50%	4%	20	4	M	13%	4.35
			Micro Channel Heat Exchangers	22%	0%	5%	15	2	M	13%	2.68
			Radiant floor heating	3%	5%	12%	15	2	M	13%	2.19
			Solar ventilation pre-heat	2%	0%	15%	15	1	L	4%	2.68
	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	60%	10	26	M	5%	3.76
		DHW	Faucet Aerators	3%	40%	1%	5	23	M	5%	18.26
			Grey Water Heat Exchanger	20%	8%	5%	10	228	L	1%	1.10
			Heat Trap	26%	35%	5%	10	228	M	5%	6.47
			Insulating Blankets	26%	65%	4%	5	228	M	5%	10.11
			Low Flow Pre-Rinse Nozzles	3%	45%	55%	5	23	H	8%	25.84
			Low Flow Showerhead	3%	15%	1%	10	23	H	8%	11.54
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	23	L	1%	2.66
			Pipe Insulation	26%	25%	1%	5	228	M	5%	3.40
			Reduced Temperature Setpoints	20%	50%	6%	10	228	O	3%	11.54
			Timers	26%	40%	5%	10	228	O	3%	6.47
			Ultrasonic Faucet Control	3%	15%	3%	10	23	M	5%	7.91
			Wastewater Reclamation	2%	5%	40%	15	23	L	1%	1.71
			Water Heater Cycling	26%	40%	5%	10	228	O	3%	6.47
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	9%	10%	15%	15	88	L	1%	3.26
			Boiler - Steam System Isolation	4%	10%	15%	20	42	L	1%	2.05
			Boiler - Steam to Hot Water Conversion	2%	10%	10%	15	42	M	5%	8.20
			Boiler Blowdown Heat Exchanger	8%	10%	4%	15	88	L	1%	0.59
			Boiler Controls / Cx and RCx	10%	20%	15%	15	88	O	3%	2.07
			HE Boilers	5%	49%	25%	15	88	H	8%	1.07
			Heat Recovery: Air to Air	4%	28%	40%	15	139	M	5%	0.54
			Heating Stack Economizer	8%	10%	4%	15	88	M	5%	2.19

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Order	Retrofit	HVAC - Gas Heat	Improved Roof/Ceiling Insulation	32%	25%	5%	20	420	L	1%	0.40
			Insulate Pipes/Lines	48%	10%	3%	5	420	O	3%	2.85
			Solar ventilation pre-heat	2%	0%	15%	15	139	L	1%	2.68
			Steam Trap Maintenance	5%	30%	17%	2	42	O	3%	3.30
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	10.51
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	19.13
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	0%	10	1	L	4%	0.00
			HE (ES) Fryers	1%	25%	15%	10	1	M	13%	5.72
			HE (ES) Hot Food Holding Cabinets	2%	25%	7%	10	2	L	4%	13.83
			HE (ES) Steam Cookers / Steamers	1%	25%	5%	10	1	L	4%	12.63
			HE Broilers	1%	40%	19%	10	1	L	4%	10.72
			HE Griddles	1%	40%	6%	10	1	L	4%	2.43
			HE Ovens	1%	20%	0%	10	1	M	13%	0.00
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	0%	10	3	L	4%	0.00
			HE Clothes Washers	8%	20%	35%	10	8	M	13%	4.70
			HE Dishwashers	8%	20%	25%	10	8	M	13%	9.26
			HE Water Heaters	26%	18%	25%	15	25	M	13%	10.34
			Heat Pump Water Heating	3%	5%	100%	15	25	L	4%	3.86
		HVAC - Gas Heat	HE Boilers	5%	49%	15%	15	7	M	13%	3.93
			HE Furnaces (<=300kBTU)	10%	45%	19%	15	7	M	13%	4.62
			HE Unit Heaters and Radiant heaters	9%	50%	6%	10	8	M	13%	2.55
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	7.11
Religious W	NC	DHW	Grey Water Heat Exchanger	16%	8%	5%	10	9	M	13%	10.38
			HE Water Heaters	22%	18%	15%	10	9	H	25%	9.01
			HE Water Heating System Design	22%	5%	5%	15	9	M	13%	3.86
		HVAC - Gas Heat	Combination Water Heater/Furnace	10%	1%	14%	15	6	L	4%	3.05
			Heat Recovery: Air to Air	15%	28%	40%	15	9	M	13%	4.91
			Improved Roof/Ceiling Insulation	60%	50%	4%	20	26	M	13%	4.35
			Micro Channel Heat Exchangers	27%	0%	5%	15	12	M	13%	2.68
			Radiant floor heating	4%	5%	12%	15	12	M	13%	2.19
			Solar ventilation pre-heat	2%	0%	15%	15	9	L	4%	2.68
	Retrofit	Cooking	HE Ventilation Hoods	1%	15%	0%	10	59	M	5%	0.00
		DHW	Faucet Aerators	2%	40%	1%	5	95	M	5%	18.26
			Grey Water Heat Exchanger	16%	8%	5%	10	945	L	1%	1.10
			Heat Trap	22%	35%	5%	10	945	M	5%	6.47
			Insulating Blankets	22%	65%	4%	5	945	M	5%	10.11
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	95	H	8%	25.84
			Low Flow Showerhead	2%	15%	1%	10	95	H	8%	11.54
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	95	L	1%	2.66
			Pipe Insulation	22%	25%	1%	5	945	M	5%	3.40
			Reduced Temperature Setpoints	16%	50%	6%	10	945	O	3%	11.54
			Timers	22%	40%	5%	10	945	O	3%	6.47
			Ultrasonic Faucet Control	2%	15%	3%	10	95	M	5%	7.91
			Wastewater Reclamation	2%	5%	40%	15	95	L	1%	1.71
			Water Heater Cycling	22%	40%	5%	10	945	O	3%	6.47

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Religious W	Retrofit	HVAC - Gas Heat	Boiler - Automatic Chemical feed	11%	10%	15%	15	551	L	1%	3.26
			Boiler - Steam System Isolation	5%	10%	15%	20	263	L	1%	2.05
			Boiler - Steam to Hot Water Conversion	3%	10%	10%	15	263	M	5%	8.20
			Boiler Blowdown Heat Exchanger	9%	10%	4%	15	551	L	1%	0.59
			Boiler Controls / Cx and RCx	13%	20%	15%	15	551	O	3%	2.07
			HE Boilers	6%	49%	25%	15	551	M	5%	1.07
			Heat Recovery: Air to Air	5%	28%	40%	15	866	M	5%	0.50
			Heating Stack Economizer	9%	10%	4%	15	551	M	5%	2.19
			Improved Roof/Ceiling Insulation	40%	25%	5%	20	2625	L	1%	0.40
			Insulate Pipes/Lines	60%	10%	3%	5	2625	O	3%	2.85
			Solar ventilation pre-heat	2%	0%	15%	15	866	L	1%	2.68
			Steam Trap Maintenance	6%	30%	17%	2	263	O	3%	3.30
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	10.51
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	19.13
	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	0%	10	2	L	4%	0.00
			HE (ES) Fryers	0%	25%	0%	10	2	M	13%	0.00
			HE (ES) Hot Food Holding Cabinets	1%	25%	0%	10	4	L	4%	0.00
			HE (ES) Steam Cookers / Steamers	0%	25%	0%	10	2	L	4%	0.00
			HE Broilers	0%	40%	19%	10	2	L	4%	10.72
			HE Griddles	0%	40%	6%	10	2	L	4%	2.43
			HE Ovens	0%	20%	0%	10	2	M	13%	0.00
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	0%	10	10	L	4%	0.00
			HE Clothes Washers	6%	20%	35%	10	31	M	13%	4.70
			HE Dishwashers	6%	20%	25%	10	31	M	13%	9.26
			HE Water Heaters	22%	18%	25%	15	104	M	13%	10.34
			Heat Pump Water Heating	2%	5%	100%	15	104	L	4%	3.86
		HVAC - Gas Heat	HE Boilers	6%	49%	15%	15	42	M	13%	3.93
			HE Furnaces (<=300kBTU)	12%	45%	19%	15	45	M	13%	4.62
			HE Unit Heaters and Radiant heaters	11%	50%	6%	10	52	M	13%	2.55
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	7.11
Service (ligh	NC	DHW	Grey Water Heat Exchanger	20%	8%	5%	10	18	M	13%	14.04
			HE Water Heaters	26%	18%	15%	10	18	H	25%	7.46
			HE Water Heating System Design	26%	5%	5%	15	18	M	13%	5.62
		HVAC - Gas Heat	Combination Water Heater/Furnace	8%	1%	14%	15	8	L	4%	4.52
			Heat Recovery: Air to Air	12%	28%	40%	15	11	M	13%	1.57
			Improved Roof/Ceiling Insulation	48%	50%	4%	20	34	M	13%	2.68
			Micro Channel Heat Exchangers	22%	0%	5%	15	15	M	13%	4.01
			Radiant floor heating	3%	5%	12%	15	15	M	13%	3.32
			Solar ventilation pre-heat	2%	0%	15%	15	11	L	4%	4.01
	Retrofit	Cooking	HE Ventilation Hoods	2%	15%	0%	10	158	M	5%	0.00
		DHW	Faucet Aerators	3%	40%	1%	5	183	M	5%	21.29
			Grey Water Heat Exchanger	20%	8%	5%	10	1827	L	1%	1.71
			Heat Trap	26%	35%	5%	10	1827	M	5%	9.01
			Insulating Blankets	26%	65%	4%	5	1827	M	5%	13.41
			Low Flow Pre-Rinse Nozzles	3%	45%	55%	5	183	H	8%	27.09
			Low Flow Showerhead	3%	15%	1%	10	183	H	8%	14.61
			Ozone Commercial Laundry System (Gas HW)	2%	5%	65%	15	183	L	1%	3.98

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service (ligh	Retrofit	DHW	Pipe Insulation	26%	25%	1%	5	1827	M	5%	5.09
			Reduced Temperature Setpoints	20%	50%	6%	10	1827	O	3%	14.61
			Timers	26%	40%	5%	10	1827	O	3%	9.01
			Ultrasonic Faucet Control	3%	15%	3%	10	183	M	5%	10.72
			Wastewater Reclamation	2%	5%	40%	15	183	L	1%	2.62
			Water Heater Cycling	26%	40%	5%	10	1827	O	3%	9.01
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	9%	10%	15%	15	706	L	1%	4.81
			Boiler - Steam System Isolation	4%	10%	15%	20	336	L	1%	3.10
			Boiler - Steam to Hot Water Conversion	2%	10%	10%	15	336	M	5%	6.00
			Boiler Blowdown Heat Exchanger	8%	10%	4%	15	706	L	1%	0.93
			Boiler Controls / Cx and RCx	10%	20%	15%	15	706	O	3%	1.68
			HE Boilers	5%	49%	25%	15	706	M	5%	1.04
			Heat Recovery: Air to Air	4%	28%	40%	15	1109	M	5%	0.41
			Heating Stack Economizer	8%	10%	4%	15	706	M	5%	3.32
			Improved Roof/Ceiling Insulation	32%	25%	5%	20	3360	L	1%	0.63
			Insulate Pipes/Lines	48%	10%	3%	5	3360	O	3%	4.31
			Solar ventilation pre-heat	2%	0%	15%	15	1109	L	1%	4.01
			Steam Trap Maintenance	5%	30%	17%	2	336	O	3%	4.97
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	13.56
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	22.02
	ROB	Cooking	Connectionless (Boilerless) Steamers	1%	25%	0%	10	6	L	4%	0.00
			HE (ES) Fryers	1%	25%	0%	10	6	M	13%	0.00
			HE (ES) Hot Food Holding Cabinets	2%	25%	0%	10	12	L	4%	0.00
			HE (ES) Steam Cookers / Steamers	1%	25%	0%	10	6	L	4%	0.00
			HE Broilers	1%	40%	19%	10	6	L	4%	13.78
			HE Griddles	1%	40%	6%	10	6	L	4%	3.68
			HE Ovens	1%	20%	0%	10	6	M	13%	0.00
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	25%	0%	10	20	L	4%	0.00
			HE Clothes Washers	8%	20%	35%	10	60	M	13%	6.78
			HE Dishwashers	8%	20%	25%	10	60	M	13%	12.22
			HE Water Heaters	26%	18%	25%	15	201	M	13%	10.34
			Heat Pump Water Heating	3%	5%	100%	15	201	L	4%	6.43
		HVAC - Gas Heat	HE Boilers	5%	49%	15%	15	54	M	13%	7.65
			HE Furnaces (<=300kBTU)	10%	45%	19%	15	58	M	13%	6.61
			HE Unit Heaters and Radiant heaters	9%	50%	6%	10	67	M	13%	3.86
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	15.69
Warehouse	NC	DHW	Grey Water Heat Exchanger	12%	8%	5%	10	8	M	13%	11.59
			HE Water Heaters	16%	18%	15%	10	8	H	25%	5.63
			HE Water Heating System Design	16%	5%	5%	15	8	M	13%	4.17
		HVAC - Gas Heat	Combination Water Heater/Furnace	13%	1%	14%	15	9	L	4%	3.31
			Heat Recovery: Air to Air	19%	13%	40%	15	13	M	13%	2.07
			Improved Roof/Ceiling Insulation	76%	50%	4%	20	40	M	13%	0.98
			Micro Channel Heat Exchangers	34%	0%	5%	15	18	M	13%	2.91
			Radiant floor heating	5%	5%	12%	15	18	M	13%	2.39
			Solar ventilation pre-heat	3%	0%	15%	15	13	L	4%	2.91

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savings Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	Retrofit	Cooking	HE Ventilation Hoods	0%	15%	0%	10	24	M	5%	0.00
		DHW	Faucet Aerators	2%	40%	1%	5	84	M	5%	18.91
			Grey Water Heat Exchanger	12%	8%	5%	10	840	L	1%	1.20
			Heat Trap	16%	35%	5%	10	840	M	5%	6.94
			Insulating Blankets	16%	65%	4%	5	840	M	5%	10.75
			Low Flow Pre-Rinse Nozzles	2%	45%	55%	5	84	H	8%	26.13
			Low Flow Showerhead	2%	15%	0%	10	84	H	8%	0.00
			Ozone Commercial Laundry System (Gas HW)	1%	5%	65%	15	84	L	1%	2.89
			Pipe Insulation	16%	25%	1%	5	840	M	5%	3.70
			Reduced Temperature Setpoints	12%	50%	6%	10	840	O	3%	12.16
			Timers	16%	40%	5%	10	840	O	3%	6.94
			Ultrasonic Faucet Control	2%	5%	3%	10	84	M	5%	8.45
			Wastewater Reclamation	1%	5%	40%	15	84	L	1%	1.87
			Water Heater Cycling	16%	40%	5%	10	840	O	3%	6.94
		HVAC - Gas Heat	Boiler - Automatic Chemical feed	14%	10%	15%	15	838	L	1%	3.53
			Boiler - Steam System Isolation	7%	10%	15%	20	399	L	1%	2.23
			Boiler - Steam to Hot Water Conversion	4%	10%	10%	15	399	M	5%	4.49
			Boiler Blowdown Heat Exchanger	12%	10%	4%	15	838	L	1%	0.65
			Boiler Controls / Cx and RCx	16%	20%	15%	15	838	O	3%	2.26
			HE Boilers	8%	49%	25%	15	838	M	5%	1.07
			Heat Recovery: Air to Air	6%	13%	40%	15	1317	M	5%	0.55
			Heating Stack Economizer	12%	10%	4%	15	838	M	5%	2.39
			Improved Roof/Ceiling Insulation	50%	25%	5%	20	3990	L	1%	0.63
			Insulate Pipes/Lines	76%	20%	3%	5	3990	O	3%	3.10
			Solar ventilation pre-heat	3%	0%	15%	15	1317	L	1%	2.91
			Steam Trap Maintenance	8%	30%	17%	2	399	O	3%	3.59
		Pool	Pool Cover	0%	10%	60%	10	0	L	1%	11.12
			TOD Pool Pump Timer	0%	30%	10%	5	0	L	1%	19.76
	ROB	Cooking	Connectionless (Boilerless) Steamers	0%	25%	50%	10	1	L	4%	13.26
			HE (ES) Fryers	0%	25%	0%	10	1	M	13%	0.00
			HE (ES) Hot Food Holding Cabinets	0%	25%	0%	10	2	L	4%	0.00
			HE (ES) Steam Cookers / Steamers	0%	25%	0%	10	1	L	4%	0.00
			HE Broilers	0%	40%	19%	10	1	L	4%	11.33
			HE Griddles	0%	40%	6%	10	1	L	4%	2.65
			HE Ovens	0%	20%	66%	10	1	M	13%	11.73
		DHW	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	1%	25%	65%	10	9	L	4%	11.64
			HE Clothes Washers	5%	20%	35%	10	28	M	13%	5.07
			HE Dishwashers	5%	20%	25%	10	28	M	13%	9.83
			HE Water Heaters	16%	18%	25%	15	92	M	13%	8.24
			Heat Pump Water Heating	2%	5%	100%	15	92	L	4%	5.18
		HVAC - Gas Heat	HE Boilers	8%	49%	15%	15	64	M	13%	5.85
			HE Furnaces (<=300kBTU)	15%	45%	19%	15	69	M	13%	4.98
			HE Unit Heaters and Radiant heaters	14%	50%	6%	10	79	M	13%	2.78
		Pool	HE Gas Pool Water Heater	0%	30%	25%	10	0	M	13%	13.26

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Bev and Tob	NC	HVAC	Air Sealing	10.0%	5%	17%	15	0.1	L	6%	0.000144	1.2
			HE (ES) Building Design	12.5%	2%	30%	15	0.2	L	6%	0.000144	1.0
			HE (ES) Windows And Skylights	6.3%	5%	19%	15	0.1	L	6%	0.000144	0.2
			HVAC System Commissioning	12.5%	0%	10%	5	0.2	L	6%	0.000144	0.1
			Improved Below-Grade Insulation	6.3%	5%	10%	15	0.1	L	6%	0.000144	0.3
			Improved Roof/Ceiling Insulation	6.3%	5%	26%	15	0.1	L	6%	0.000144	0.9
			Improved Wall Insulation	6.3%	5%	26%	15	0.1	L	6%	0.000144	0.4
			Cool Roofs And Exterior Walls	12.5%	2%	12%	15	0.2	L	6%	0.000144	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	5.0%	10%	12%	15	0.1	M	18%	0.000144	5.3
		Lighting	Replace T12 with HP T8/T5	5.0%	54%	49%	15	0.1	O	3%	0.000144	2.1
			Replace High Bay HID with T8 (70% conv)	1.8%	50%	22%	15	0.0	H	36%	0.000144	19.9
			Replace High Bay HID with PSMH (30% conv)	0.8%	59%	10%	15	0.0	H	36%	0.000144	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000144	19.9
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000144	3.1
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000144	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000144	2.9
			Efficient Lighting Design/Layout	7.3%	80%	37%	11	0.1	H	36%	0.000144	1.9
			Interior Lighting Timers/Elapsed Time Switching	6.0%	75%	40%	25	0.1	H	36%	0.000144	3.0
			Exterior Light Timers	1.7%	85%	30%	15	0.0	M	18%	0.000144	14.3
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	1.4%	60%	10%	15	2.0	O	2%	0.000144	0.3
			VSD For Air Compressor Motors	0.7%	30%	10%	15	2.0	M	3%	0.000144	3.4
			Blower Purge Dryer	0.3%	20%	50%	15	0.4	L	1%	0.000144	9.6
			Regulated Compressed Air Nozzles	1.5%	50%	2%	15	2.2	L	1%	0.000144	11.5
			Compressed Air Storage Tank	1.8%	50%	2%	15	2.6	L	1%	0.000144	11.5
			Compressed Air System Design/Control	1.8%	80%	20%	15	2.6	L	1%	0.000144	3.2
			Process - Swap CA Tools For Electric Ones	1.8%	70%	50%	10	2.6	L	1%	0.000144	12.8
			Advanced Lubricants	0.3%	5%	3%	1	0.5	L	1%	0.000144	5.0
			Cooler Ambient Temperature (-11 Of)	1.8%	5%	1%	20	2.6	L	1%	0.000144	10.4
			Cycling Air Dryer	0.5%	25%	50%	10	0.7	L	1%	0.000144	3.4
			Duct In Outside Air To Compressor	1.4%	10%	2%	20	2.0	L	1%	0.000144	10.4
			Oil Temperature Control	0.7%	33%	2%	10	1.0	M	3%	0.000144	1.4
			Compressed Air System Isolation	1.8%	20%	2%	15	2.6	O	3%	0.000144	1.3
			Compressed Air System Leak Repair	1.8%	50%	10%	2	2.6	O	3%	0.000144	4.3
			Eliminating Wasteful Uses	1.8%	50%	1%	5	2.6	O	3%	0.000144	4.0
			Reduce Operating Pressure Of Compressed Air System	1.8%	50%	3%	20	2.6	O	3%	0.000144	13.0
			Regular Maintenance	1.8%	50%	5%	1	2.6	O	3%	0.000144	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.0	O	3%	0.000144	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.0	O	3%	0.000144	4.0
			Air Compressor System Management	1.8%	25%	20%	2	2.6	O	3%	0.000144	0.4
			Advanced Air Compression Controls	1.5%	30%	4%	15	2.2	O	3%	0.000144	1.3

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Bev and Tob	Retrofit	Air Compression	Electric Supply System Improvements	1.8%	10%	3%	5	2.6	M	3%	0.000144	5.5
			Night Shut Off For Compressor	1.4%	50%	10%	10	2.1	M	3%	0.000144	16.0
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	12.5%	50%	15%	2	18.3	M	3%	0.000144	5.9
			Energy Management System	12.5%	10%	10%	5	18.3	M	3%	0.000144	10.9
			HE (ES) Windows And Skylights	6.3%	5%	19%	15	9.2	L	1%	0.000144	0.2
			HVAC System By-Pass Timer	12.5%	50%	5%	5	18.3	L	1%	0.000144	3.8
			HVAC System Tune-Up/Maintenance	12.5%	20%	10%	5	18.3	L	1%	0.000144	0.1
			Improve Duct Sealing	12.5%	15%	7%	10	18.3	M	3%	0.000144	5.8
			Improved Below-Grade Insulation	6.3%	5%	10%	15	9.2	L	1%	0.000144	0.3
			Improved Roof/Ceiling Insulation	6.3%	5%	26%	15	9.2	L	1%	0.000144	0.9
			Improved Wall Insulation	6.3%	5%	26%	15	9.2	L	1%	0.000144	0.4
			Insulate Pipes/Lines	12.5%	80%	3%	5	18.3	M	3%	0.000144	6.5
			Thermostat Calibration	12.5%	10%	5%	5	18.3	L	1%	0.000144	14.1
			Ventilation Controls Installed	10.0%	5%	15%	5	14.7	L	1%	0.000144	28.7
			Cool Roofs And Exterior Walls	12.5%	2%	12%	15	18.3	L	1%	0.000144	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	2.0%	50%	20%	10	2.9	M	3%	0.000144	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	1.3%	40%	30%	10	1.8	O	4%	0.000144	0.9
			HVAC System Retrocommissioning*	12.5%	0%	10%	5	18.3	L	1%	0.000144	0.1
			Programmable Thermostat	12.5%	50%	4%	5	18.3	L	1%	0.000144	14.1
			Time Clock	12.5%	10%	4%	5	18.3	L	1%	0.000144	14.1
		HVAC - Cooling	Electric Supply System Improvements	5.0%	10%	3%	5	7.3	L	1%	0.000144	5.5
			Chilled Water Free Cooling Controls And Equipments	1.9%	50%	30%	15	2.8	M	3%	0.000144	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	5.0%	25%	5%	15	7.3	M	3%	0.000144	0.3
			Chiller Optimization Controls	5.0%	25%	5%	15	7.3	M	3%	0.000144	1.7
			Chiller, Early Retirement	5.0%	5%	5%	15	7.3	L	1%	0.000144	0.3
			Motor System Optimization (Incl. Resizing and Asd)	4.7%	5%	6%	10	6.9	M	3%	0.000144	0.9
			Economizer (Hydronic Or Outside Air)	1.3%	2%	20%	10	1.8	M	3%	0.000144	3.4
			Ultraviolet A/C Coil Cleaning System	1.3%	25%	4%	2	1.8	L	1%	0.000144	0.3
			Cooling Tower Optimization	0.6%	25%	5%	5	0.9	M	3%	0.000144	0.4
		Lighting	Replace T12 with HP T8/T5	5.0%	54%	46%	15	7.4	O	3%	0.000144	0.9
			Replace High Bay HID with T8 (70% conv)	1.8%	50%	22%	15	3.7	O	3%	0.000144	6.2
			Replace High Bay HID with PSMH (30% conv)	0.8%	59%	10%	15	3.7	O	0%	0.000144	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.2	O	3%	0.000144	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	0.2	O	0%	0.000144	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.2	L	1%	0.000144	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.2	O	1%	0.000144	0.6
			Efficient Lighting Design/Layout	7.3%	80%	37%	11	10.7	M	3%	0.000144	1.9
			Interior Lighting Timers/Elapsed Time Switching	6.0%	75%	40%	25	8.8	M	3%	0.000144	3.0
			Exterior Light Timers	1.7%	85%	30%	15	2.5	M	3%	0.000144	14.3
		Motors	Improved Sensors And Process Controls	12.4%	40%	3%	10	18.2	M	3%	0.000144	1.5

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Bev and Tob	Retrofit	Motors	Fan System Efficiency Improvements	4.9%	10%	6%	10	7.2	M	3%	0.000144	4.9
			Pump System Efficiency Improvements	6.8%	10%	16%	10	9.9	M	3%	0.000144	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	3.4%	25%	2%	5	5.0	O	3%	0.000144	1.2
			Motor Early Retirement	8.7%	60%	5%	10	12.7	M	3%	0.000144	4.9
			Advanced Lubricants and Drivetrain Maintenance	9.5%	5%	3%	1	13.9	M	3%	0.000144	13.4
			Motor Optimization / Variable Speed Drives (Process Fans,	9.7%	60%	30%	15	14.2	O	3%	0.000144	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	4.1%	25%	2%	10	60.6	M	3%	0.000144	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	10.3%	40%	3%	2	60.6	L	1%	0.000144	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	41.3%	25%	3%	5	60.6	L	1%	0.000144	10.3
			Process Rework and Scrap Reduction	41.3%	25%	3%	5	60.6	L	1%	0.000144	10.3
		Process Cooling	Improved Sensors And Process Controls	8.6%	40%	3%	10	12.6	M	3%	0.000144	2.1
			Advanced Lubricants	3.3%	5%	3%	1	4.8	H	4%	0.000144	5.0
			Electric Supply System Improvements	28.6%	10%	3%	5	41.9	M	3%	0.000144	5.5
			Air Curtain Technologies	8.6%	50%	30%	20	12.6	M	3%	0.000144	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	8.6%	50%	5%	10	12.6	M	3%	0.000144	0.6
			Condensate Evaporator	10.7%	10%	5%	10	15.7	M	3%	0.000144	1.9
			Defrost Control System	14.3%	25%	3%	10	21.0	M	3%	0.000144	4.8
			Desuperheaters	7.2%	10%	5%	10	10.5	M	3%	0.000144	8.8
			Economizer For Walk-In Coolers	1.4%	10%	10%	10	2.1	M	3%	0.000144	1.5
			Evaporate Pre-Cooler	7.2%	10%	5%	10	10.5	M	3%	0.000144	0.3
			Evaporator Fan Controller	7.2%	10%	1%	10	10.5	M	3%	0.000144	4.8
			Floating Head Pressure Control	14.3%	50%	5%	10	21.0	M	3%	0.000144	3.2
			Insulated Suction Lines	14.3%	50%	1%	5	21.0	H	4%	0.000144	1.2
			Liquid Pressure Amplifiers	14.3%	10%	5%	5	21.0	M	3%	0.000144	2.4
			Refrigeration System Maintenance	28.6%	25%	5%	3	41.9	M	3%	0.000144	8.1
			Repair Refrigerator/Freezer Leaks	28.6%	50%	10%	3	41.9	M	3%	0.000144	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	2.9%	0%	7%	15	4.2	M	3%	0.000144	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	2.9%	0%	4%	15	4.2	M	3%	0.000144	3.3
			VSD On Refrigeration Circulating Pump	14.3%	30%	30%	15	21.0	M	3%	0.000144	3.4
			VSD On Refrigeration Fan	14.3%	30%	30%	15	21.0	M	3%	0.000144	3.4
			Chiller Temperature Reset	28.6%	50%	1%	1	41.9	M	3%	0.000144	1.5
		Process Heating	Improved Sensors And Process Controls	2.0%	70%	8%	10	2.9	M	3%	0.000144	1.5
			Water Heater Cycling	0.5%	50%	15%	10	0.7	M	3%	0.000144	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.7%	35%	2%	15	1.1	O	4%	0.000144	0.8
			Load Management (Process Changes)	2.0%	25%	2%	10	2.9	M	3%	0.000144	4.9
			Timers (Process Heating)	2.0%	70%	3%	10	2.9	M	3%	0.000144	9.2
			Heat Containment Improvements	0.5%	70%	5%	10	0.7	M	3%	0.000144	10.4
			Heat Transfer Improvements	0.5%	70%	5%	10	0.7	M	3%	0.000144	1.5
			Heat Recovery Improvements	2.0%	70%	5%	10	2.9	M	3%	0.000144	1.5
		Other	Advanced Lubricants	1.2%	5%	2%	1	1.8	M	3%	0.000144	4.9

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Bev and Tob	Retrofit	Other	Electric Supply System Improvements	5.2%	10%	3%	5	7.6	M	3%	0.000144	5.4
	ROB	Air Compression	Variable Displacement Compressor	1.0%	30%	10%	15	0.1	L	6%	0.000144	0.8
		HVAC	Destratification Fans	1.3%	20%	20%	10	0.2	M	18%	0.000144	0.9
			HE Heat Pumps, Including Geothermal	2.0%	33%	8%	15	0.2	L	6%	0.000144	0.7
			HE HVAC System Design	10.0%	10%	8%	15	1.1	L	6%	0.000144	1.1
			Industrial Air Curtains	2.0%	80%	2%	5	0.6	M	18%	0.000144	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	5.0%	10%	12%	15	0.6	L	6%	0.000144	5.3
			Heat Reclaim Absorption Chillers	0.3%	1%	90%	15	0.0	L	6%	0.000144	7.2
			HE Packaged AC	1.3%	20%	25%	10	0.2	M	18%	0.000144	5.7
			HE Rooftop Ac Systems	1.3%	10%	25%	10	0.2	M	18%	0.000144	5.7
		Motors	Motor - Nema Premium Efficiency	8.7%	50%	2%	25	0.6	O	1%	0.000144	2.0
				10.3%	50%	2%	25	0.8	O	1%	0.000144	2.0
				22.3%	50%	2%	25	1.6	O	1%	0.000144	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	4.1%	10%	67%	15	4.6	L	6%	0.000144	0.8
		Process Cooling	Energy Efficient Equipment	28.6%	50%	1%	20	2.5	M	18%	0.000144	0.5
			HE Compressors	14.3%	50%	8%	15	1.6	O	3%	0.000144	2.8
			HE Condensers	14.3%	50%	2%	15	1.6	L	6%	0.000144	2.8
			Cooling Tower Free Cooling	28.6%	50%	1%	10	4.6	M	18%	0.000144	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.0%	5%	2%	8	0.0	M	18%	0.000144	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.0%	5%	2%	15	0.0	M	18%	0.000144	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.0%	50%	2%	5	0.0	M	18%	0.000144	4.2
		Other	Motor - Nema Premium Efficiency	5.2%	50%	1%	25	0.4	O	1%	0.000144	2.0
			Transformers (Nema Tier Ii)	1.0%	5%	3%	30	0.1	M	18%	0.000144	0.2
Chemicals	NC	HVAC	Air Sealing	5.1%	5%	17%	15	1.2	L	6%	0.000124	1.2
			HE (ES) Building Design	6.4%	2%	30%	15	1.6	L	6%	0.000124	1.0
			HE (ES) Windows And Skylights	3.2%	5%	19%	15	0.8	L	6%	0.000124	0.2
			HVAC System Commissioning	6.4%	0%	10%	5	1.6	L	6%	0.000124	0.1
			Improved Below-Grade Insulation	3.2%	5%	10%	15	0.8	L	6%	0.000124	0.3
			Improved Roof/Ceiling Insulation	3.2%	5%	26%	15	0.8	L	6%	0.000124	0.9
			Improved Wall Insulation	3.2%	5%	26%	15	0.8	L	6%	0.000124	0.4
			Cool Roofs And Exterior Walls	6.4%	2%	12%	15	1.6	L	6%	0.000124	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2.5%	10%	12%	15	0.6	M	18%	0.000124	5.2
		Lighting	Replace T12 with HP T8/T5	2.6%	54%	49%	15	0.6	O	3%	0.000124	2.1
			Replace High Bay HID with T8 (70% conv)	0.9%	50%	22%	15	0.3	H	36%	0.000124	19.8
			Replace High Bay HID with PSMH (30% conv)	0.4%	59%	10%	15	0.3	H	36%	0.000124	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	0.0	H	36%	0.000124	19.8
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000124	3.1
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000124	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000124	2.8
			Efficient Lighting Design/Layout	3.7%	80%	37%	11	0.9	H	36%	0.000124	1.9

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Chemicals	NC	Lighting	Interior Lighting Timers/Elapsed Time Switching	3.0%	75%	40%	25	0.7	H	36%	0.000124	3.0
			Exterior Light Timers	0.9%	85%	30%	15	0.2	M	18%	0.000124	14.2
	Retrofit	Air Compression	VSD For Air Compressor Motors	0.0%	30%	10%	15	0.0	M	3%	0.000124	3.4
			Blower Purge Dryer	0.0%	20%	50%	15	0.0	L	1%	0.000124	9.5
			Regulated Compressed Air Nozzles	0.0%	50%	2%	15	0.0	L	1%	0.000124	11.4
			Compressed Air Storage Tank	0.0%	50%	2%	15	0.0	L	1%	0.000124	11.4
			Compressed Air System Design/Control	0.0%	80%	20%	15	0.0	L	1%	0.000124	3.2
			Process - Swap CA Tools For Electric Ones	0.0%	70%	50%	10	0.0	L	1%	0.000124	12.7
			Advanced Lubricants	0.0%	5%	3%	1	0.0	L	1%	0.000124	5.0
			Cooler Ambient Temperature (-11 Of)	0.0%	5%	1%	20	0.0	L	1%	0.000124	10.3
			Cycling Air Dryer	0.0%	25%	50%	10	0.0	L	1%	0.000124	3.4
			Duct In Outside Air To Compressor	0.0%	10%	2%	20	0.0	L	1%	0.000124	10.3
			Oil Temperature Control	0.0%	33%	2%	10	0.0	M	3%	0.000124	1.4
			Compressed Air System Isolation	0.0%	20%	2%	15	0.0	O	3%	0.000124	1.3
			Compressed Air System Leak Repair	0.0%	50%	10%	2	0.0	O	3%	0.000124	4.3
			Eliminating Wasteful Uses	0.0%	50%	1%	5	0.0	O	3%	0.000124	4.0
			Reduce Operating Pressure Of Compressed Air System	0.0%	50%	3%	20	0.0	O	3%	0.000124	12.9
			Regular Maintenance	0.0%	50%	5%	1	0.0	O	3%	0.000124	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.0	O	3%	0.000124	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.0	O	3%	0.000124	4.0
			Air Compressor System Management	0.0%	25%	20%	2	0.0	O	3%	0.000124	0.4
			Advanced Air Compression Controls	0.0%	30%	4%	15	0.0	O	3%	0.000124	1.3
			Electric Supply System Improvements	0.0%	10%	3%	5	0.0	M	3%	0.000124	5.5
			Night Shut Off For Compressor	0.0%	50%	10%	10	0.0	M	3%	0.000124	15.9
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	6.4%	50%	15%	2	155.5	M	3%	0.000124	5.9
			Energy Management System	6.4%	10%	10%	5	155.5	M	3%	0.000124	10.8
			HE (ES) Windows And Skylights	3.2%	5%	19%	15	77.8	L	1%	0.000124	0.2
			HVAC System By-Pass Timer	6.4%	50%	5%	5	155.5	L	1%	0.000124	3.8
			HVAC System Tune-Up/Maintenance	6.4%	20%	10%	5	155.5	L	1%	0.000124	0.1
			Improve Duct Sealing	6.4%	15%	7%	10	155.5	M	3%	0.000124	5.8
			Improved Below-Grade Insulation	3.2%	5%	10%	15	77.8	L	1%	0.000124	0.3
			Improved Roof/Ceiling Insulation	3.2%	5%	26%	15	77.8	L	1%	0.000124	0.9
			Improved Wall Insulation	3.2%	5%	26%	15	77.8	L	1%	0.000124	0.4
			Insulate Pipes/Lines	6.4%	80%	3%	5	155.5	M	3%	0.000124	6.5
			Thermostat Calibration	6.4%	10%	5%	5	155.5	L	1%	0.000124	14.0
			Ventilation Controls Installed	5.1%	5%	15%	5	124.4	L	1%	0.000124	28.5
			Cool Roofs And Exterior Walls	6.4%	2%	12%	15	155.5	L	1%	0.000124	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.0%	50%	20%	10	24.9	M	3%	0.000124	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.6%	40%	30%	10	15.6	O	4%	0.000124	0.9
			HVAC System Retrocommissioning*	6.4%	0%	10%	5	155.5	L	1%	0.000124	0.1

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Chemicals	Retrofit	HVAC	Programmable Thermostat	6.4%	50%	4%	5	155.5	L	1%	0.000124	14.0
			Time Clock	6.4%	10%	4%	5	155.5	L	1%	0.000124	14.0
		HVAC - Cooling	Electric Supply System Improvements	2.5%	10%	3%	5	61.3	L	1%	0.000124	5.5
			Chilled Water Free Cooling Controls And Equipments	0.9%	50%	30%	15	23.0	M	3%	0.000124	11.6
			Chilled Water Reset, Optimizer For Chiller(S)	2.5%	25%	5%	15	61.3	M	3%	0.000124	0.3
			Chiller Optimization Controls	2.5%	25%	5%	15	61.3	M	3%	0.000124	1.7
			Chiller, Early Retirement	2.5%	5%	5%	15	61.3	L	1%	0.000124	0.3
			Motor System Optimization (Incl. Resizing and Asd)	2.4%	5%	6%	10	57.5	M	3%	0.000124	0.9
			Economizer (Hydronic Or Outside Air)	0.6%	2%	20%	10	15.3	M	3%	0.000124	3.3
			Ultraviolet A/C Coil Cleaning System	0.6%	25%	4%	2	15.3	L	1%	0.000124	0.3
			Cooling Tower Optimization	0.3%	25%	5%	5	7.7	M	3%	0.000124	0.4
		Lighting	Replace T12 with HP T8/T5	2.6%	54%	46%	15	63.1	O	3%	0.000124	0.9
			Replace High Bay HID with T8 (70% conv)	0.9%	50%	22%	15	30.6	M	3%	0.000124	6.1
			Replace High Bay HID with PSMH (30% conv)	0.4%	59%	10%	15	30.6	O	0%	0.000124	0.8
			ReplaceNon-High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	1.7	O	3%	0.000124	6.1
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	1.7	O	0%	0.000124	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	1.7	L	1%	0.000124	1.2
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	1.7	O	1%	0.000124	0.6
			Efficient Lighting Design/Layout	3.7%	80%	37%	11	90.2	M	3%	0.000124	1.9
			Interior Lighting Timers/Elapsed Time Switching	3.0%	75%	40%	25	74.3	M	3%	0.000124	3.0
			Exterior Light Timers	0.9%	85%	30%	15	21.2	M	3%	0.000124	14.2
		Motors	Improved Sensors And Process Controls	17.4%	40%	3%	10	425.1	M	3%	0.000124	1.5
			Fan System Efficiency Improvements	10.4%	10%	6%	10	255.1	M	3%	0.000124	4.9
			Pump System Efficiency Improvements	18.6%	10%	16%	10	453.4	M	3%	0.000124	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	9.3%	25%	2%	5	226.7	O	3%	0.000124	1.2
			Motor Early Retirement	11.6%	60%	5%	10	283.4	M	3%	0.000124	4.9
			Advanced Lubricants and Drivetrain Maintenance	13.3%	5%	3%	1	325.9	M	3%	0.000124	13.3
			Motor Optimization / Variable Speed Drives (Process Fans,	22.1%	60%	30%	15	538.5	O	3%	0.000124	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	5.8%	25%	2%	10	1417.0	M	3%	0.000124	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	14.5%	40%	3%	2	1417.0	M	3%	0.000124	4.1
			Improved Process Scheduling and Deenergizing Idle Mach	58.0%	25%	3%	5	1417.0	L	1%	0.000124	10.2
			Process Rework and Scrap Reduction	58.0%	25%	3%	5	1417.0	L	1%	0.000124	10.2
		Process Cooling	Improved Sensors And Process Controls	2.5%	40%	3%	10	62.2	M	3%	0.000124	2.1
			Advanced Lubricants	1.0%	5%	3%	1	23.8	H	4%	0.000124	5.0
			Electric Supply System Improvements	8.5%	10%	3%	5	207.4	M	3%	0.000124	5.5
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000124	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	2.5%	50%	5%	10	62.2	M	3%	0.000124	0.6
			Condensate Evaporator	3.2%	10%	5%	10	77.8	M	3%	0.000124	1.9
			Defrost Control System	4.2%	25%	3%	10	103.7	M	3%	0.000124	4.8
			Desuperheaters	2.1%	10%	5%	10	51.8	M	3%	0.000124	8.7

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Chemicals	Retrofit	Process Cooling	Economizer For Walk-In Coolers	0.4%	10%	10%	10	10.4	M	3%	0.000124	1.5
			Evaporate Pre-Cooler	2.1%	10%	5%	10	51.8	M	3%	0.000124	0.3
			Evaporator Fan Controller	2.1%	10%	1%	10	51.8	M	3%	0.000124	4.8
			Floating Head Pressure Control	4.2%	50%	5%	10	103.7	M	3%	0.000124	3.1
			Insulated Suction Lines	4.2%	50%	1%	5	103.7	H	4%	0.000124	1.2
			Liquid Pressure Amplifiers	4.2%	10%	5%	5	103.7	M	3%	0.000124	2.3
			Refrigeration System Maintenance	8.5%	25%	5%	3	207.4	M	3%	0.000124	8.1
			Repair Refrigerator/Freezer Leaks	8.5%	50%	10%	3	207.4	M	3%	0.000124	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.8%	0%	7%	15	20.7	M	3%	0.000124	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.8%	0%	4%	15	20.7	M	3%	0.000124	3.3
			VSD On Refrigeration Circulating Pump	4.2%	30%	30%	15	103.7	M	3%	0.000124	3.4
			VSD On Refrigeration Fan	4.2%	30%	30%	15	103.7	M	3%	0.000124	3.4
			Chiller Temperature Reset	8.5%	50%	1%	1	207.4	M	3%	0.000124	1.5
		Process Heating	Improved Sensors And Process Controls	3.3%	70%	8%	10	81.5	M	3%	0.000124	1.4
			Water Heater Cycling	0.2%	50%	15%	10	5.1	M	3%	0.000124	14.5
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.3%	35%	2%	15	8.1	O	4%	0.000124	0.8
			Load Management (Process Changes)	3.3%	25%	2%	10	81.5	M	3%	0.000124	4.9
			Timers (Process Heating)	3.3%	70%	3%	10	81.5	M	3%	0.000124	9.1
			Heat Containment Improvements	0.8%	70%	5%	10	20.4	M	3%	0.000124	10.3
			Heat Transfer Improvements	0.8%	70%	5%	10	20.4	M	3%	0.000124	1.4
			Heat Recovery Improvements	3.3%	70%	5%	10	81.5	M	3%	0.000124	1.4
		Other	Advanced Lubricants	4.5%	5%	2%	1	109.0	M	3%	0.000124	4.9
			Electric Supply System Improvements	19.4%	10%	3%	5	474.0	M	3%	0.000124	5.4
	ROB	Air Compression	Variable Displacement Compressor	0.0%	30%	10%	15	0.0	L	6%	0.000124	0.8
		HVAC	Destratification Fans	0.6%	20%	20%	10	1.7	M	18%	0.000124	0.9
			HE Heat Pumps, Including Geothermal	1.0%	33%	8%	15	1.9	L	6%	0.000124	0.7
			HE HVAC System Design	5.1%	10%	8%	15	9.5	L	6%	0.000124	1.1
			Industrial Air Curtains	1.0%	80%	2%	5	5.2	M	18%	0.000124	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2.5%	10%	12%	15	4.7	L	6%	0.000124	5.2
			Heat Reclaim Absorption Chillers	0.2%	1%	90%	15	0.3	L	6%	0.000124	7.1
			HE Packaged AC	0.6%	20%	25%	10	1.7	M	18%	0.000124	5.6
			HE Rooftop Ac Systems	0.6%	10%	25%	10	1.7	M	18%	0.000124	5.6
		Motors	Motor - Nema Premium Efficiency	11.6%	50%	2%	25	14.2	O	1%	0.000124	2.0
				17.4%	50%	2%	25	21.3	O	1%	0.000124	2.0
				29.0%	50%	2%	25	35.4	O	1%	0.000124	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	5.8%	10%	67%	15	108.6	L	6%	0.000124	0.8
		Process Cooling	Energy Efficient Equipment	8.5%	50%	1%	20	12.4	M	18%	0.000124	0.5
			HE Compressors	4.2%	50%	8%	15	7.9	L	6%	0.000124	2.8
			HE Condensers	4.2%	50%	2%	15	7.9	L	6%	0.000124	2.8
			Cooling Tower Free Cooling	8.5%	50%	1%	10	22.8	M	18%	0.000124	1.2

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Chemicals	ROB	Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.1%	5%	2%	8	0.3	M	18%	0.000124	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.1%	5%	2%	15	0.2	M	18%	0.000124	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.3%	50%	2%	5	1.7	M	18%	0.000124	4.2
		Other	Motor - Nema Premium Efficiency	19.4%	50%	1%	25	23.7	O	1%	0.000124	2.0
			Transformers (Nema Tier Ii)	3.9%	5%	3%	30	4.1	M	18%	0.000124	0.2
Fabricated Metals	NC	HVAC	Air Sealing	8.1%	5%	17%	15	1.7	L	6%	0.000151	1.2
			HE (ES) Building Design	10.1%	2%	30%	15	2.2	L	6%	0.000151	1.0
			HE (ES) Windows And Skylights	5.1%	5%	19%	15	1.1	L	6%	0.000151	0.2
			HVAC System Commissioning	10.1%	0%	10%	5	2.2	L	6%	0.000151	0.1
			Improved Below-Grade Insulation	5.1%	5%	10%	15	1.1	L	6%	0.000151	0.3
			Improved Roof/Ceiling Insulation	5.1%	5%	26%	15	1.1	L	6%	0.000151	0.9
			Improved Wall Insulation	5.1%	5%	26%	15	1.1	L	6%	0.000151	0.4
			Cool Roofs And Exterior Walls	10.1%	2%	12%	15	2.2	L	6%	0.000151	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4.3%	10%	12%	15	0.9	M	18%	0.000151	5.3
		Lighting	Replace T12 with HP T8/T5	5.4%	54%	49%	15	1.2	O	3%	0.000151	2.2
			Replace High Bay HID with T8 (70% conv)	2.0%	50%	22%	15	0.6	H	36%	0.000151	20.0
			Replace High Bay HID with PSMH (30% conv)	0.9%	59%	10%	15	0.6	H	36%	0.000151	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000151	20.0
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000151	3.1
			Replace Exterior HID with Induction Lighting	0.2%	2%	43%	15	0.0	L	6%	0.000151	2.7
			Replace Exterior HID with LED Lighting	0.2%	2%	60%	15	0.0	O	1%	0.000151	2.9
			Efficient Lighting Design/Layout	8.0%	80%	37%	11	1.7	H	36%	0.000151	1.9
			Interior Lighting Timers/Elapsed Time Switching	6.6%	75%	40%	25	1.4	H	36%	0.000151	3.0
			Exterior Light Timers	1.9%	85%	30%	15	0.4	M	18%	0.000151	14.4
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	1.4%	60%	10%	15	29.0	O	2%	0.000151	0.3
			VSD For Air Compressor Motors	0.7%	30%	10%	15	29.0	M	3%	0.000151	3.4
			Blower Purge Dryer	0.3%	20%	50%	15	5.8	L	1%	0.000151	9.6
			Regulated Compressed Air Nozzles	1.5%	50%	2%	15	32.3	L	1%	0.000151	11.5
			Compressed Air Storage Tank	1.8%	50%	2%	15	37.9	L	1%	0.000151	11.5
			Compressed Air System Design/Control	1.8%	80%	20%	15	37.9	L	1%	0.000151	3.2
			Process - Swap CA Tools For Electric Ones	1.8%	70%	50%	10	37.9	L	1%	0.000151	12.9
			Advanced Lubricants	0.3%	5%	3%	1	6.7	L	1%	0.000151	5.0
			Cooler Ambient Temperature (-11 Of)	1.8%	5%	1%	20	37.9	L	1%	0.000151	10.4
			Cycling Air Dryer	0.5%	25%	50%	10	9.7	L	1%	0.000151	3.4
			Duct In Outside Air To Compressor	1.4%	10%	2%	20	29.0	L	1%	0.000151	10.4
			Oil Temperature Control	0.7%	33%	2%	10	14.5	M	3%	0.000151	1.4
			Compressed Air System Isolation	1.8%	20%	2%	15	37.9	O	3%	0.000151	1.3
			Compressed Air System Leak Repair	1.8%	50%	10%	2	37.9	O	3%	0.000151	4.3
			Eliminating Wasteful Uses	1.8%	50%	1%	5	37.9	O	3%	0.000151	4.0

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Fabricated	Retrofit	Air Compression	Reduce Operating Pressure Of Compressed Air System	1.8%	50%	3%	20	37.9	O	3%	0.000151	13.0
			Regular Maintenance	1.8%	50%	5%	1	37.9	O	3%	0.000151	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.2	O	3%	0.000151	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.2	O	3%	0.000151	4.0
			Air Compressor System Management	1.8%	25%	20%	2	37.9	O	3%	0.000151	0.4
			Advanced Air Compression Controls	1.5%	30%	4%	15	32.3	O	3%	0.000151	1.3
			Electric Supply System Improvements	1.8%	10%	3%	5	37.9	M	3%	0.000151	5.6
			Night Shut Off For Compressor	1.4%	50%	10%	10	30.4	M	3%	0.000151	16.1
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	10.1%	50%	15%	2	217.2	M	3%	0.000151	5.9
			Energy Management System	10.1%	10%	10%	5	217.2	M	3%	0.000151	10.9
			HE (ES) Windows And Skylights	5.1%	5%	19%	15	108.6	L	1%	0.000151	0.2
			HVAC System By-Pass Timer	10.1%	50%	5%	5	217.2	L	1%	0.000151	3.8
			HVAC System Tune-Up/Maintenance	10.1%	20%	10%	5	217.2	L	1%	0.000151	0.1
			Improve Duct Sealing	10.1%	15%	7%	10	217.2	M	3%	0.000151	5.8
			Improved Below-Grade Insulation	5.1%	5%	10%	15	108.6	L	1%	0.000151	0.3
			Improved Roof/Ceiling Insulation	5.1%	5%	26%	15	108.6	L	1%	0.000151	0.9
			Improved Wall Insulation	5.1%	5%	26%	15	108.6	L	1%	0.000151	0.4
			Insulate Pipes/Lines	10.1%	80%	3%	5	217.2	M	3%	0.000151	6.5
			Thermostat Calibration	10.1%	10%	5%	5	217.2	L	1%	0.000151	14.1
			Ventilation Controls Installed	8.1%	5%	15%	5	173.8	L	1%	0.000151	28.8
			Cool Roofs And Exterior Walls	10.1%	2%	12%	15	217.2	L	1%	0.000151	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.6%	50%	20%	10	34.8	M	3%	0.000151	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	1.0%	40%	30%	10	21.7	O	4%	0.000151	0.9
			HVAC System Retrocommissioning*	10.1%	0%	10%	5	217.2	L	1%	0.000151	0.1
			Programmable Thermostat	10.1%	50%	4%	5	217.2	L	1%	0.000151	14.1
			Time Clock	10.1%	10%	4%	5	217.2	L	1%	0.000151	14.1
		HVAC - Cooling	Electric Supply System Improvements	4.3%	10%	3%	5	93.0	L	1%	0.000151	5.5
			Chilled Water Free Cooling Controls And Equipments	1.6%	50%	30%	15	34.9	M	3%	0.000151	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	4.3%	25%	5%	15	93.0	M	3%	0.000151	0.3
			Chiller Optimization Controls	4.3%	25%	5%	15	93.0	M	3%	0.000151	1.7
			Chiller, Early Retirement	4.3%	5%	5%	15	93.0	L	1%	0.000151	0.3
			Motor System Optimization (Incl. Resizing and Asd)	4.1%	5%	6%	10	87.2	M	3%	0.000151	0.9
			Economizer (Hydronic Or Outside Air)	1.1%	2%	20%	10	23.3	M	3%	0.000151	3.4
			Ultraviolet A/C Coil Cleaning System	1.1%	25%	4%	2	23.3	L	1%	0.000151	0.3
			Cooling Tower Optimization	0.5%	25%	5%	5	11.6	M	3%	0.000151	0.4
		Lighting	Replace T12 with HP T8/T5	5.4%	54%	46%	15	116.5	O	3%	0.000151	0.9
			Replace High Bay HID with T8 (70% conv)	2.0%	50%	22%	15	61.9	M	3%	0.000151	6.2
			Replace High Bay HID with PSMH (30% conv)	0.9%	59%	10%	15	61.9	O	0%	0.000151	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	3.4	O	3%	0.000151	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	3.4	O	0%	0.000151	0.8

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Fabricated	Retrofit	Lighting	Replace Exterior HID with Induction Lighting	0.2%	2%	43%	15	3.4	L	1%	0.000151	1.3
			Replace Exterior HID with LED Lighting	0.2%	2%	60%	15	3.4	O	1%	0.000151	0.6
			Efficient Lighting Design/Layout	8.0%	80%	37%	11	171.9	M	3%	0.000151	1.9
			Interior Lighting Timers/Elapsed Time Switching	6.6%	75%	40%	25	141.5	M	3%	0.000151	3.0
			Exterior Light Timers	1.9%	85%	30%	15	40.4	M	3%	0.000151	14.4
		Motors	Improved Sensors And Process Controls	13.2%	40%	3%	10	284.6	M	3%	0.000151	1.5
			Fan System Efficiency Improvements	7.9%	10%	6%	10	170.7	M	3%	0.000151	5.0
			Pump System Efficiency Improvements	14.1%	10%	16%	10	303.5	M	3%	0.000151	5.0
			Trim Existing Pump Impeller To More Closely Match Syster	7.1%	25%	2%	5	151.8	O	3%	0.000151	1.2
			Motor Early Retirement	8.8%	60%	5%	10	189.7	M	3%	0.000151	5.0
			Advanced Lubricants and Drivetrain Maintenance	10.2%	5%	3%	1	218.2	M	3%	0.000151	13.4
			Motor Optimization / Variable Speed Drives (Process Fans,	12.8%	60%	30%	15	275.1	O	3%	0.000151	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	4.4%	25%	2%	10	948.6	M	3%	0.000151	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	11.0%	40%	3%	2	948.6	M	3%	0.000151	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	44.1%	25%	3%	5	948.6	L	1%	0.000151	10.3
			Process Rework and Scrap Reduction	44.1%	25%	3%	5	948.6	L	1%	0.000151	10.3
		Process Cooling	Improved Sensors And Process Controls	1.1%	40%	3%	10	22.6	M	3%	0.000151	2.1
			Advanced Lubricants	0.4%	5%	3%	1	8.7	H	4%	0.000151	5.0
			Electric Supply System Improvements	3.5%	10%	3%	5	75.3	M	3%	0.000151	5.6
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000151	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1.1%	50%	5%	10	22.6	M	3%	0.000151	0.6
			Condensate Evaporator	1.3%	10%	5%	10	28.2	M	3%	0.000151	1.9
			Defrost Control System	1.8%	25%	3%	10	37.6	M	3%	0.000151	4.8
			Desuperheaters	0.9%	10%	5%	10	18.8	M	3%	0.000151	8.8
			Economizer For Walk-In Coolers	0.2%	10%	10%	10	3.8	M	3%	0.000151	1.5
			Evaporate Pre-Cooler	0.9%	10%	5%	10	18.8	M	3%	0.000151	0.3
			Evaporator Fan Controller	0.9%	10%	1%	10	18.8	M	3%	0.000151	4.8
			Floating Head Pressure Control	1.8%	50%	5%	10	37.6	M	3%	0.000151	3.2
			Insulated Suction Lines	1.8%	50%	1%	5	37.6	H	4%	0.000151	1.2
			Liquid Pressure Amplifiers	1.8%	10%	5%	5	37.6	M	3%	0.000151	2.4
			Refrigeration System Maintenance	3.5%	25%	5%	3	75.3	M	3%	0.000151	8.1
			Repair Refrigerator/Freezer Leaks	3.5%	50%	10%	3	75.3	M	3%	0.000151	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.4%	0%	7%	15	7.5	M	3%	0.000151	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.4%	0%	4%	15	7.5	M	3%	0.000151	3.4
			VSD On Refrigeration Circulating Pump	1.8%	30%	30%	15	37.6	M	3%	0.000151	3.4
			VSD On Refrigeration Fan	1.8%	30%	30%	15	37.6	M	3%	0.000151	3.4
			Chiller Temperature Reset	3.5%	50%	1%	1	75.3	M	3%	0.000151	1.5
		Process Heating	Improved Sensors And Process Controls	22.9%	70%	8%	10	492.6	M	3%	0.000151	1.5
			Water Heater Cycling	0.3%	50%	15%	10	6.2	M	3%	0.000151	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.5%	35%	2%	15	9.9	O	4%	0.000151	0.8

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Fabricated	Retrofit	Process Heating	Load Management (Process Changes)	22.9%	25%	2%	10	492.6	M	3%	0.000151	5.0
			Timers (Process Heating)	22.9%	70%	3%	10	492.6	M	3%	0.000151	9.2
			Heat Containment Improvements	5.7%	70%	5%	10	123.1	M	3%	0.000151	10.4
			Heat Transfer Improvements	5.7%	70%	5%	10	123.1	M	3%	0.000151	1.5
			Heat Recovery Improvements	22.9%	70%	5%	10	492.6	M	3%	0.000151	1.5
		Other	Advanced Lubricants	1.9%	5%	2%	1	40.1	M	3%	0.000151	4.9
			Electric Supply System Improvements	8.1%	10%	3%	5	174.2	M	3%	0.000151	5.5
	ROB	Air Compression	Variable Displacement Compressor	1.0%	30%	10%	15	1.7	L	6%	0.000151	0.8
		HVAC	Destratification Fans	1.0%	20%	20%	10	2.4	M	18%	0.000151	0.9
			HE Heat Pumps, Including Geothermal	1.6%	33%	8%	15	2.7	L	6%	0.000151	0.7
			HE HVAC System Design	8.1%	10%	8%	15	13.3	L	6%	0.000151	1.1
			Industrial Air Curtains	1.6%	80%	2%	5	7.3	M	18%	0.000151	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4.3%	10%	12%	15	7.1	L	6%	0.000151	5.3
			Heat Reclaim Absorption Chillers	0.3%	1%	90%	15	0.4	L	6%	0.000151	7.2
			HE Packaged AC	1.1%	20%	25%	10	2.6	M	18%	0.000151	5.7
			HE Rooftop Ac Systems	1.1%	10%	25%	10	2.6	M	18%	0.000151	5.7
		Motors	Motor - Nema Premium Efficiency	8.8%	50%	2%	25	9.5	O	1%	0.000151	2.0
				13.2%	50%	2%	25	14.2	O	1%	0.000151	2.0
				22.1%	50%	2%	25	23.7	O	1%	0.000151	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	4.4%	10%	67%	15	72.7	L	6%	0.000151	0.8
		Process Cooling	Energy Efficient Equipment	3.5%	50%	1%	20	4.5	M	18%	0.000151	0.5
			HE Compressors	1.8%	50%	8%	15	2.9	L	6%	0.000151	2.9
			HE Condensers	1.8%	50%	2%	15	2.9	L	6%	0.000151	2.9
			Cooling Tower Free Cooling	3.5%	50%	1%	10	8.3	M	18%	0.000151	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.4%	5%	2%	8	1.2	M	18%	0.000151	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.4%	5%	2%	15	0.7	M	18%	0.000151	0.6
			Emmissions RTO - Reduce Head Loss Through Media	1.1%	50%	2%	5	5.2	M	18%	0.000151	4.2
		Other	Motor - Nema Premium Efficiency	8.1%	50%	1%	25	8.7	O	1%	0.000151	2.0
			Transformers (Nema Tier Ii)	1.6%	5%	3%	30	1.5	M	18%	0.000151	0.2
Food	NC	HVAC	Air Sealing	6.5%	5%	17%	15	2.0	L	6%	0.000144	1.2
			HE (ES) Building Design	8.1%	2%	30%	15	2.6	L	6%	0.000144	1.0
			HE (ES) Windows And Skylights	4.1%	5%	19%	15	1.3	L	6%	0.000144	0.2
			HVAC System Commissioning	8.1%	0%	10%	5	2.6	L	6%	0.000144	0.1
			Improved Below-Grade Insulation	4.1%	5%	10%	15	1.3	L	6%	0.000144	0.3
			Improved Roof/Ceiling Insulation	4.1%	5%	26%	15	1.3	L	6%	0.000144	0.9
			Improved Wall Insulation	4.1%	5%	26%	15	1.3	L	6%	0.000144	0.4
			Cool Roofs And Exterior Walls	8.1%	2%	12%	15	2.6	L	6%	0.000144	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3.0%	10%	12%	15	0.9	M	18%	0.000144	5.3
		Lighting	Replace T12 with HP T8/T5	3.9%	54%	49%	15	1.2	O	3%	0.000144	2.1
			Replace High Bay HID with T8 (70% conv)	1.4%	50%	22%	15	0.6	H	36%	0.000144	19.9

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Food	NC	Lighting	Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	0.6	H	36%	0.000144	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000144	19.9
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000144	3.1
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000144	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000144	2.9
			Efficient Lighting Design/Layout	5.6%	80%	37%	11	1.8	H	36%	0.000144	1.9
			Interior Lighting Timers/Elapsed Time Switching	4.6%	75%	40%	25	1.5	H	36%	0.000144	3.0
			Exterior Light Timers	1.3%	85%	30%	15	0.4	M	18%	0.000144	14.3
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	0.8%	60%	10%	15	23.6	O	2%	0.000144	0.3
			VSD For Air Compressor Motors	0.4%	30%	10%	15	23.6	M	3%	0.000144	3.4
			Blower Purge Dryer	0.2%	20%	50%	15	4.7	L	1%	0.000144	9.6
			Regulated Compressed Air Nozzles	0.8%	50%	2%	15	26.3	L	1%	0.000144	11.5
			Compressed Air Storage Tank	1.0%	50%	2%	15	30.9	L	1%	0.000144	11.5
			Compressed Air System Design/Control	1.0%	80%	20%	15	30.9	L	1%	0.000144	3.2
			Process - Swap CA Tools For Electric Ones	1.0%	70%	50%	10	30.9	L	1%	0.000144	12.8
			Advanced Lubricants	0.2%	5%	3%	1	5.4	L	1%	0.000144	5.0
			Cooler Ambient Temperature (-11 Of)	1.0%	5%	1%	20	30.9	L	1%	0.000144	10.4
			Cycling Air Dryer	0.3%	25%	50%	10	7.9	L	1%	0.000144	3.4
			Duct In Outside Air To Compressor	0.8%	10%	2%	20	23.6	L	1%	0.000144	10.4
			Oil Temperature Control	0.4%	33%	2%	10	11.8	M	3%	0.000144	1.4
			Compressed Air System Isolation	1.0%	20%	2%	15	30.9	O	3%	0.000144	1.3
			Compressed Air System Leak Repair	1.0%	50%	10%	2	30.9	O	3%	0.000144	4.3
			Eliminating Wasteful Uses	1.0%	50%	1%	5	30.9	O	3%	0.000144	4.0
			Reduce Operating Pressure Of Compressed Air System	1.0%	50%	3%	20	30.9	O	3%	0.000144	13.0
			Regular Maintenance	1.0%	50%	5%	1	30.9	O	3%	0.000144	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.1	O	3%	0.000144	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.1	O	3%	0.000144	4.0
			Air Compressor System Management	1.0%	25%	20%	2	30.9	O	3%	0.000144	0.4
			Advanced Air Compression Controls	0.8%	30%	4%	15	26.3	O	3%	0.000144	1.3
			Electric Supply System Improvements	1.0%	10%	3%	5	30.9	M	3%	0.000144	5.5
			Night Shut Off For Compressor	0.8%	50%	10%	10	24.7	M	3%	0.000144	16.0
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	8.1%	50%	15%	2	255.4	M	3%	0.000144	5.9
			Energy Management System	8.1%	10%	10%	5	255.4	M	3%	0.000144	10.9
			HE (ES) Windows And Skylights	4.1%	5%	19%	15	127.7	L	1%	0.000144	0.2
			HVAC System By-Pass Timer	8.1%	50%	5%	5	255.4	L	1%	0.000144	3.8
			HVAC System Tune-Up/Maintenance	8.1%	20%	10%	5	255.4	L	1%	0.000144	0.1
			Improve Duct Sealing	8.1%	15%	7%	10	255.4	M	3%	0.000144	5.8
			Improved Below-Grade Insulation	4.1%	5%	10%	15	127.7	L	1%	0.000144	0.3
			Improved Roof/Ceiling Insulation	4.1%	5%	26%	15	127.7	L	1%	0.000144	0.9
			Improved Wall Insulation	4.1%	5%	26%	15	127.7	L	1%	0.000144	0.4

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Food	Retrofit	HVAC	Insulate Pipes/Lines	8.1%	80%	3%	5	255.4	M	3%	0.000144	6.5
			Thermostat Calibration	8.1%	10%	5%	5	255.4	L	1%	0.000144	14.1
			Ventilation Controls Installed	6.5%	5%	15%	5	204.3	L	1%	0.000144	28.7
			Cool Roofs And Exterior Walls	8.1%	2%	12%	15	255.4	L	1%	0.000144	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.3%	50%	20%	10	40.9	M	3%	0.000144	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.8%	40%	30%	10	25.5	O	4%	0.000144	0.9
			HVAC System Retrocommissioning*	8.1%	0%	10%	5	255.4	L	1%	0.000144	0.1
			Programmable Thermostat	8.1%	50%	4%	5	255.4	L	1%	0.000144	14.1
			Time Clock	8.1%	10%	4%	5	255.4	L	1%	0.000144	14.1
		HVAC - Cooling	Electric Supply System Improvements	3.0%	10%	3%	5	93.2	L	1%	0.000144	5.5
			Chilled Water Free Cooling Controls And Equipments	1.1%	50%	30%	15	34.9	M	3%	0.000144	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	3.0%	25%	5%	15	93.2	M	3%	0.000144	0.3
			Chiller Optimization Controls	3.0%	25%	5%	15	93.2	M	3%	0.000144	1.7
			Chiller, Early Retirement	3.0%	5%	5%	15	93.2	L	1%	0.000144	0.3
			Motor System Optimization (Incl. Resizing and Asd)	2.8%	5%	6%	10	87.3	M	3%	0.000144	0.9
			Economizer (Hydronic Or Outside Air)	0.7%	2%	20%	10	23.3	M	3%	0.000144	3.4
			Ultraviolet A/C Coil Cleaning System	0.7%	25%	4%	2	23.3	L	1%	0.000144	0.3
			Cooling Tower Optimization	0.4%	25%	5%	5	11.6	M	3%	0.000144	0.4
		Lighting	Replace T12 with HP T8/T5	3.9%	54%	46%	15	121.7	O	3%	0.000144	0.9
			Replace High Bay HID with T8 (70% conv)	1.4%	50%	22%	15	61.8	M	3%	0.000144	6.2
			Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	61.8	O	0%	0.000144	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	3.4	O	3%	0.000144	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	3.4	O	0%	0.000144	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	3.4	L	1%	0.000144	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	3.4	O	1%	0.000144	0.6
			Efficient Lighting Design/Layout	5.6%	80%	37%	11	176.9	M	3%	0.000144	1.9
			Interior Lighting Timers/Elapsed Time Switching	4.6%	75%	40%	25	145.7	M	3%	0.000144	3.0
			Exterior Light Timers	1.3%	85%	30%	15	41.6	M	3%	0.000144	14.3
		Motors	Improved Sensors And Process Controls	15.0%	40%	3%	10	472.0	M	3%	0.000144	1.5
			Fan System Efficiency Improvements	5.9%	10%	6%	10	187.2	M	3%	0.000144	4.9
			Pump System Efficiency Improvements	8.2%	10%	16%	10	258.0	M	3%	0.000144	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	4.1%	25%	2%	5	129.0	O	3%	0.000144	1.2
			Motor Early Retirement	10.5%	60%	5%	10	330.4	M	3%	0.000144	4.9
			Advanced Lubricants and Drivetrain Maintenance	11.5%	5%	3%	1	361.9	M	3%	0.000144	13.4
			Motor Optimization / Variable Speed Drives (Process Fans	11.7%	60%	30%	15	368.2	O	3%	0.000144	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	5.0%	25%	2%	10	1573.4	M	3%	0.000144	4.0
			Use of Energy Efficient Belts and Other Improved Mechani	12.5%	40%	3%	2	1573.4	M	3%	0.000144	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	49.9%	25%	3%	5	1573.4	L	1%	0.000144	10.3
			Process Rework and Scrap Reduction	49.9%	25%	3%	5	1573.4	L	1%	0.000144	10.3
		Process Cooling	Improved Sensors And Process Controls	7.5%	40%	3%	10	235.5	M	3%	0.000144	2.1

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Food	Retrofit	Process Cooling	Advanced Lubricants	2.9%	5%	3%	1	90.3	H	4%	0.000144	5.0
			Electric Supply System Improvements	24.9%	10%	3%	5	785.1	M	3%	0.000144	5.5
			Air Curtain Technologies	7.5%	50%	30%	20	235.5	M	3%	0.000144	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	7.5%	50%	5%	10	235.5	M	3%	0.000144	0.6
			Condensate Evaporator	9.3%	10%	5%	10	294.4	M	3%	0.000144	1.9
			Defrost Control System	12.5%	25%	3%	10	392.6	M	3%	0.000144	4.8
			Desuperheaters	6.2%	10%	5%	10	196.3	M	3%	0.000144	8.8
			Economizer For Walk-In Coolers	1.2%	10%	10%	10	39.3	M	3%	0.000144	1.5
			Evaporate Pre-Cooler	6.2%	10%	5%	10	196.3	M	3%	0.000144	0.3
			Evaporator Fan Controller	6.2%	10%	1%	10	196.3	M	3%	0.000144	4.8
			Floating Head Pressure Control	12.5%	50%	5%	10	392.6	M	3%	0.000144	3.2
			Insulated Suction Lines	12.5%	50%	1%	5	392.6	H	4%	0.000144	1.2
			Liquid Pressure Amplifiers	12.5%	10%	5%	5	392.6	M	3%	0.000144	2.4
			Refrigeration System Maintenance	24.9%	25%	5%	3	785.1	M	3%	0.000144	8.1
			Repair Refrigerator/Freezer Leaks	24.9%	50%	10%	3	785.1	M	3%	0.000144	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	2.5%	0%	7%	15	78.5	M	3%	0.000144	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	2.5%	0%	4%	15	78.5	M	3%	0.000144	3.3
			VSD On Refrigeration Circulating Pump	12.5%	30%	30%	15	392.6	M	3%	0.000144	3.4
			VSD On Refrigeration Fan	12.5%	30%	30%	15	392.6	M	3%	0.000144	3.4
			Chiller Temperature Reset	24.9%	50%	1%	1	785.1	M	3%	0.000144	1.5
		Process Heating	Improved Sensors And Process Controls	3.0%	70%	8%	10	94.6	M	3%	0.000144	1.5
			Water Heater Cycling	0.7%	50%	15%	10	21.3	M	3%	0.000144	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1.1%	35%	2%	15	34.1	O	4%	0.000144	0.8
			Load Management (Process Changes)	3.0%	25%	2%	10	94.6	M	3%	0.000144	4.9
			Timers (Process Heating)	3.0%	70%	3%	10	94.6	M	3%	0.000144	9.2
			Heat Containment Improvements	0.8%	70%	5%	10	23.6	M	3%	0.000144	10.4
			Heat Transfer Improvements	0.8%	70%	5%	10	23.6	M	3%	0.000144	1.5
			Heat Recovery Improvements	3.0%	70%	5%	10	94.6	M	3%	0.000144	1.5
		Other	Advanced Lubricants	1.5%	5%	2%	1	46.4	M	3%	0.000144	4.9
			Electric Supply System Improvements	6.4%	10%	3%	5	201.8	M	3%	0.000144	5.4
	ROB	Air Compression	Variable Displacement Compressor	0.6%	30%	10%	15	1.4	L	6%	0.000144	0.8
		HVAC	Destratification Fans	0.8%	20%	20%	10	2.8	M	18%	0.000144	0.9
			HE Heat Pumps, Including Geothermal	1.3%	33%	8%	15	3.1	L	6%	0.000144	0.7
			HE HVAC System Design	6.5%	10%	8%	15	15.7	L	6%	0.000144	1.1
			Industrial Air Curtains	1.3%	80%	2%	5	8.6	M	18%	0.000144	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3.0%	10%	12%	15	7.1	L	6%	0.000144	5.3
			Heat Reclaim Absorption Chillers	0.2%	1%	90%	15	0.4	L	6%	0.000144	7.2
			HE Packaged AC	0.7%	20%	25%	10	2.6	M	18%	0.000144	5.7
			HE Rooftop Ac Systems	0.7%	10%	25%	10	2.6	M	18%	0.000144	5.7
		Motors	Motor - Nema Premium Efficiency	10.5%	50%	2%	25	16.5	O	1%	0.000144	2.0

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Food	ROB	Motors	Motor - Nema Premium Efficiency	12.5%	50%	2%	25	19.7	O	1%	0.000144	2.0
				27.0%	50%	2%	25	42.5	O	1%	0.000144	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	5.0%	10%	67%	15	120.6	L	6%	0.000144	0.8
		Process Cooling	Energy Efficient Equipment	24.9%	50%	1%	20	47.1	M	18%	0.000144	0.5
			HE Compressors	12.5%	50%	8%	15	30.1	L	6%	0.000144	2.8
			HE Condensers	12.5%	50%	2%	15	30.1	L	6%	0.000144	2.8
			Cooling Tower Free Cooling	24.9%	50%	1%	10	86.4	M	18%	0.000144	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.0%	5%	2%	8	0.1	M	18%	0.000144	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.0%	5%	2%	15	0.0	M	18%	0.000144	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.0%	50%	2%	5	0.1	M	18%	0.000144	4.2
		Other	Motor - Nema Premium Efficiency	6.4%	50%	1%	25	10.1	O	1%	0.000144	2.0
			Transformers (Nema Tier Ii)	1.3%	5%	3%	30	1.7	M	18%	0.000144	0.2
Machinery	NC	HVAC	Air Sealing	14.7%	5%	17%	15	3.3	L	6%	0.000164	1.2
			HE (ES) Building Design	18.4%	2%	30%	15	4.1	L	6%	0.000164	1.0
			HE (ES) Windows And Skylights	9.2%	5%	19%	15	2.1	L	6%	0.000164	0.2
			HVAC System Commissioning	18.4%	0%	10%	5	4.1	L	6%	0.000164	0.1
			Improved Below-Grade Insulation	9.2%	5%	10%	15	2.1	L	6%	0.000164	0.3
			Improved Roof/Ceiling Insulation	9.2%	5%	26%	15	2.1	L	6%	0.000164	0.9
			Improved Wall Insulation	9.2%	5%	26%	15	2.1	L	6%	0.000164	0.4
			Cool Roofs And Exterior Walls	18.4%	2%	12%	15	4.1	L	6%	0.000164	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	7.9%	10%	12%	15	1.8	M	18%	0.000164	5.3
		Lighting	Replace T12 with HP T8/T5	8.5%	54%	49%	15	1.9	O	3%	0.000164	2.2
			Replace High Bay HID with T8 (70% conv)	2.4%	50%	22%	15	0.8	H	36%	0.000164	20.1
			Replace High Bay HID with PSMH (30% conv)	1.0%	59%	10%	15	0.8	H	36%	0.000164	3.2
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000164	20.1
			Replace Inefficient Non High Bay HID with PSMH	0.1%	59%	10%	15	0.0	H	36%	0.000164	3.2
			Replace Exterior HID with Induction Lighting	0.2%	2%	43%	15	0.0	L	6%	0.000164	2.7
			Replace Exterior HID with LED Lighting	0.2%	2%	60%	15	0.0	O	1%	0.000164	2.9
			Efficient Lighting Design/Layout	11.7%	80%	37%	11	2.6	H	36%	0.000164	1.9
			Interior Lighting Timers/Elapsed Time Switching	9.6%	75%	40%	25	2.2	H	36%	0.000164	3.1
			Exterior Light Timers	2.7%	85%	30%	15	0.6	M	18%	0.000164	14.4
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	1.9%	60%	10%	15	42.2	O	2%	0.000164	0.3
			VSD For Air Compressor Motors	0.9%	30%	10%	15	42.2	M	3%	0.000164	3.4
			Blower Purge Dryer	0.4%	20%	50%	15	8.4	L	1%	0.000164	9.7
			Regulated Compressed Air Nozzles	2.1%	50%	2%	15	46.8	L	1%	0.000164	11.6
			Compressed Air Storage Tank	2.5%	50%	2%	15	55.1	L	1%	0.000164	11.6
			Compressed Air System Design/Control	2.5%	80%	20%	15	55.1	L	1%	0.000164	3.2
			Process - Swap CA Tools For Electric Ones	2.5%	70%	50%	10	55.1	L	1%	0.000164	12.9
			Advanced Lubricants	0.4%	5%	3%	1	9.7	L	1%	0.000164	5.0
			Cooler Ambient Temperature (-11 Of)	2.5%	5%	1%	20	55.1	L	1%	0.000164	10.4

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Machinery	Retrofit	Air Compression	Cycling Air Dryer	0.6%	25%	50%	10	14.1	L	1%	0.000164	3.4
			Duct In Outside Air To Compressor	1.9%	10%	2%	20	42.2	L	1%	0.000164	10.4
			Oil Temperature Control	0.9%	33%	2%	10	21.1	M	3%	0.000164	1.4
			Compressed Air System Isolation	2.5%	20%	2%	15	55.1	O	3%	0.000164	1.3
			Compressed Air System Leak Repair	2.5%	50%	10%	2	55.1	O	3%	0.000164	4.3
			Eliminating Wasteful Uses	2.5%	50%	1%	5	55.1	O	3%	0.000164	4.0
			Reduce Operating Pressure Of Compressed Air System	2.5%	50%	3%	20	55.1	O	3%	0.000164	13.0
			Regular Maintenance	2.5%	50%	5%	1	55.1	O	3%	0.000164	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.2	O	3%	0.000164	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.2	O	3%	0.000164	4.0
			Air Compressor System Management	2.5%	25%	20%	2	55.1	O	3%	0.000164	0.4
			Advanced Air Compression Controls	2.1%	30%	4%	15	46.8	O	3%	0.000164	1.3
			Electric Supply System Improvements	2.5%	10%	3%	5	55.1	M	3%	0.000164	5.6
			Night Shut Off For Compressor	2.0%	50%	10%	10	44.1	M	3%	0.000164	16.2
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	18.4%	50%	15%	2	413.8	M	3%	0.000164	6.0
			Energy Management System	18.4%	10%	10%	5	413.8	M	3%	0.000164	11.0
			HE (ES) Windows And Skylights	9.2%	5%	19%	15	206.9	L	1%	0.000164	0.2
			HVAC System By-Pass Timer	18.4%	50%	5%	5	413.8	L	1%	0.000164	3.8
			HVAC System Tune-Up/Maintenance	18.4%	20%	10%	5	413.8	L	1%	0.000164	0.1
			Improve Duct Sealing	18.4%	15%	7%	10	413.8	M	3%	0.000164	5.9
			Improved Below-Grade Insulation	9.2%	5%	10%	15	206.9	L	1%	0.000164	0.3
			Improved Roof/Ceiling Insulation	9.2%	5%	26%	15	206.9	L	1%	0.000164	0.9
			Improved Wall Insulation	9.2%	5%	26%	15	206.9	L	1%	0.000164	0.4
			Insulate Pipes/Lines	18.4%	80%	3%	5	413.8	M	3%	0.000164	6.6
			Thermostat Calibration	18.4%	10%	5%	5	413.8	L	1%	0.000164	14.2
			Ventilation Controls Installed	14.7%	5%	15%	5	331.0	L	1%	0.000164	28.9
			Cool Roofs And Exterior Walls	18.4%	2%	12%	15	413.8	L	1%	0.000164	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	2.9%	50%	20%	10	66.2	M	3%	0.000164	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	1.8%	40%	30%	10	41.4	O	4%	0.000164	0.9
			HVAC System Retrocommissioning*	18.4%	0%	10%	5	413.8	L	1%	0.000164	0.1
			Programmable Thermostat	18.4%	50%	4%	5	413.8	L	1%	0.000164	14.2
			Time Clock	18.4%	10%	4%	5	413.8	L	1%	0.000164	14.2
		HVAC - Cooling	Electric Supply System Improvements	7.9%	10%	3%	5	177.2	L	1%	0.000164	5.6
			Chilled Water Free Cooling Controls And Equipments	3.0%	50%	30%	15	66.4	M	3%	0.000164	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	7.9%	25%	5%	15	177.2	M	3%	0.000164	0.3
			Chiller Optimization Controls	7.9%	25%	5%	15	177.2	M	3%	0.000164	1.8
			Chiller, Early Retirement	7.9%	5%	5%	15	177.2	L	1%	0.000164	0.3
			Motor System Optimization (Incl. Resizing and Asd)	7.4%	5%	6%	10	166.1	M	3%	0.000164	0.9
			Economizer (Hydronic Or Outside Air)	2.0%	2%	20%	10	44.3	M	3%	0.000164	3.4
			Ultraviolet A/C Coil Cleaning System	2.0%	25%	4%	2	44.3	L	1%	0.000164	0.3

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Machinery	Retrofit	HVAC - Cooling	Cooling Tower Optimization	1.0%	25%	5%	5	22.1	M	3%	0.000164	0.4
		Lighting	Replace T12 with HP T8/T5	8.5%	54%	46%	15	191.3	O	3%	0.000164	0.9
			Replace High Bay HID with T8 (70% conv)	2.4%	50%	22%	15	77.6	M	3%	0.000164	6.2
			Replace High Bay HID with PSMH (30% conv)	1.0%	59%	10%	15	77.6	O	0%	0.000164	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	4.3	O	3%	0.000164	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.1%	59%	10%	15	4.3	O	0%	0.000164	0.8
			Replace Exterior HID with Induction Lighting	0.2%	2%	43%	15	4.3	L	1%	0.000164	1.3
			Replace Exterior HID with LED Lighting	0.2%	2%	60%	15	4.3	O	1%	0.000164	0.6
			Efficient Lighting Design/Layout	11.7%	80%	37%	11	261.9	M	3%	0.000164	1.9
			Interior Lighting Timers/Elapsed Time Switching	9.6%	75%	40%	25	215.6	M	3%	0.000164	3.1
			Exterior Light Timers	2.7%	85%	30%	15	61.6	M	3%	0.000164	14.4
		Motors	Improved Sensors And Process Controls	14.6%	40%	3%	10	327.2	M	3%	0.000164	1.5
			Fan System Efficiency Improvements	8.7%	10%	6%	10	196.3	M	3%	0.000164	5.0
			Pump System Efficiency Improvements	15.6%	10%	16%	10	349.0	M	3%	0.000164	5.0
			Trim Existing Pump Impeller To More Closely Match Syster	7.8%	25%	2%	5	174.5	O	3%	0.000164	1.2
			Motor Early Retirement	9.7%	60%	5%	10	218.1	M	3%	0.000164	5.0
			Advanced Lubricants and Drivetrain Maintenance	11.2%	5%	3%	1	250.8	M	3%	0.000164	13.5
			Motor Optimization / Variable Speed Drives (Process Fans,	14.1%	60%	30%	15	316.3	O	3%	0.000164	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	4.9%	25%	2%	10	1090.6	M	3%	0.000164	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	12.1%	40%	3%	2	1090.6	M	3%	0.000164	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	48.6%	25%	3%	5	1090.6	L	1%	0.000164	10.4
			Process Rework and Scrap Reduction	48.6%	25%	3%	5	1090.6	L	1%	0.000164	10.4
		Process Cooling	Improved Sensors And Process Controls	1.0%	40%	3%	10	22.3	M	3%	0.000164	2.2
			Advanced Lubricants	0.4%	5%	3%	1	8.5	H	4%	0.000164	5.0
			Electric Supply System Improvements	3.3%	10%	3%	5	74.2	M	3%	0.000164	5.6
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000164	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1.0%	50%	5%	10	22.3	M	3%	0.000164	0.6
			Condensate Evaporator	1.2%	10%	5%	10	27.8	M	3%	0.000164	1.9
			Defrost Control System	1.7%	25%	3%	10	37.1	M	3%	0.000164	4.9
			Desuperheaters	0.8%	10%	5%	10	18.6	M	3%	0.000164	8.9
			Economizer For Walk-In Coolers	0.2%	10%	10%	10	3.7	M	3%	0.000164	1.5
			Evaporate Pre-Cooler	0.8%	10%	5%	10	18.6	M	3%	0.000164	0.3
			Evaporator Fan Controller	0.8%	10%	1%	10	18.6	M	3%	0.000164	4.9
			Floating Head Pressure Control	1.7%	50%	5%	10	37.1	M	3%	0.000164	3.2
			Insulated Suction Lines	1.7%	50%	1%	5	37.1	H	4%	0.000164	1.2
			Liquid Pressure Amplifiers	1.7%	10%	5%	5	37.1	M	3%	0.000164	2.4
			Refrigeration System Maintenance	3.3%	25%	5%	3	74.2	M	3%	0.000164	8.2
			Repair Refrigerator/Freezer Leaks	3.3%	50%	10%	3	74.2	M	3%	0.000164	8.2
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.3%	0%	7%	15	7.4	M	3%	0.000164	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.3%	0%	4%	15	7.4	M	3%	0.000164	3.4

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Machinery	Retrofit	Process Cooling	VSD On Refrigeration Circulating Pump	1.7%	30%	30%	15	37.1	M	3%	0.000164	3.4
			VSD On Refrigeration Fan	1.7%	30%	30%	15	37.1	M	3%	0.000164	3.4
			Chiller Temperature Reset	3.3%	50%	1%	1	74.2	M	3%	0.000164	1.5
		Process Heating	Improved Sensors And Process Controls	7.4%	70%	8%	10	166.4	M	3%	0.000164	1.5
			Water Heater Cycling	0.1%	50%	15%	10	2.1	M	3%	0.000164	14.7
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.1%	35%	2%	15	3.3	O	4%	0.000164	0.8
			Load Management (Process Changes)	7.4%	25%	2%	10	166.4	M	3%	0.000164	5.0
			Timers (Process Heating)	7.4%	70%	3%	10	166.4	M	3%	0.000164	9.2
			Heat Containment Improvements	1.9%	70%	5%	10	41.6	M	3%	0.000164	10.4
			Heat Transfer Improvements	1.9%	70%	5%	10	41.6	M	3%	0.000164	1.5
			Heat Recovery Improvements	7.4%	70%	5%	10	166.4	M	3%	0.000164	1.5
		Other	Advanced Lubricants	1.4%	5%	2%	1	31.0	M	3%	0.000164	5.0
			Electric Supply System Improvements	6.0%	10%	3%	5	134.9	M	3%	0.000164	5.5
	ROB	Air Compression	Variable Displacement Compressor	1.4%	30%	10%	15	2.4	L	6%	0.000164	0.8
		HVAC	Destratification Fans	1.8%	20%	20%	10	4.6	M	18%	0.000164	0.9
			HE Heat Pumps, Including Geothermal	2.9%	33%	8%	15	5.1	L	6%	0.000164	0.7
			HE HVAC System Design	14.7%	10%	8%	15	25.4	L	6%	0.000164	1.1
			Industrial Air Curtains	2.9%	80%	2%	5	13.9	M	18%	0.000164	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	7.9%	10%	12%	15	13.6	L	6%	0.000164	5.3
			Heat Reclaim Absorption Chillers	0.5%	1%	90%	15	0.8	L	6%	0.000164	7.2
			HE Packaged AC	2.0%	20%	25%	10	4.9	M	18%	0.000164	5.7
			HE Rooftop Ac Systems	2.0%	10%	25%	10	4.9	M	18%	0.000164	5.7
		Motors	Motor - Nema Premium Efficiency	9.7%	50%	2%	25	10.9	O	1%	0.000164	2.1
				14.6%	50%	2%	25	16.4	O	1%	0.000164	2.1
				24.3%	50%	2%	25	27.3	O	1%	0.000164	2.1
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	4.9%	10%	67%	15	83.6	L	6%	0.000164	0.8
		Process Cooling	Energy Efficient Equipment	3.3%	50%	1%	20	4.5	M	18%	0.000164	0.5
			HE Compressors	1.7%	50%	8%	15	2.8	L	6%	0.000164	2.9
			HE Condensers	1.7%	50%	2%	15	2.8	L	6%	0.000164	2.9
			Cooling Tower Free Cooling	3.3%	50%	1%	10	8.2	M	18%	0.000164	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.1%	5%	2%	8	0.4	M	18%	0.000164	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.1%	5%	2%	15	0.2	M	18%	0.000164	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.4%	50%	2%	5	1.7	M	18%	0.000164	4.3
		Other	Motor - Nema Premium Efficiency	6.0%	50%	1%	25	6.7	O	1%	0.000164	2.0
			Transformers (Nema Tier Ii)	1.2%	5%	3%	30	1.2	M	18%	0.000164	0.2
Metals Primary	NC	HVAC	Air Sealing	3.1%	5%	17%	15	0.9	L	6%	0.000134	1.2
			HE (ES) Building Design	3.9%	2%	30%	15	1.1	L	6%	0.000134	1.0
			HE (ES) Windows And Skylights	1.9%	5%	19%	15	0.5	L	6%	0.000134	0.2
			HVAC System Commissioning	3.9%	0%	10%	5	1.1	L	6%	0.000134	0.1
			Improved Below-Grade Insulation	1.9%	5%	10%	15	0.5	L	6%	0.000134	0.3

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Metals Primary	NC	HVAC	Improved Roof/Ceiling Insulation	1.9%	5%	26%	15	0.5	L	6%	0.000134	0.9
			Improved Wall Insulation	1.9%	5%	26%	15	0.5	L	6%	0.000134	0.4
			Cool Roofs And Exterior Walls	3.9%	2%	12%	15	1.1	L	6%	0.000134	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	1.6%	10%	12%	15	0.4	M	18%	0.000134	5.2
		Lighting	Replace T12 with HP T8/T5	1.6%	54%	49%	15	0.5	O	3%	0.000134	2.1
			Replace High Bay HID with T8 (70% conv)	0.6%	50%	22%	15	0.2	H	36%	0.000134	19.9
			Replace High Bay HID with PSMH (30% conv)	0.3%	59%	10%	15	0.2	H	36%	0.000134	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	0.0	H	36%	0.000134	19.9
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000134	3.1
			Replace Exterior HID with Induction Lighting	0.0%	2%	43%	15	0.0	L	6%	0.000134	2.7
			Replace Exterior HID with LED Lighting	0.0%	2%	60%	15	0.0	O	1%	0.000134	2.8
			Efficient Lighting Design/Layout	2.5%	80%	37%	11	0.7	H	36%	0.000134	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.0%	75%	40%	25	0.6	H	36%	0.000134	3.0
			Exterior Light Timers	0.6%	85%	30%	15	0.2	M	18%	0.000134	14.3
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	0.5%	60%	10%	15	14.5	O	2%	0.000134	0.3
			VSD For Air Compressor Motors	0.3%	30%	10%	15	14.5	M	3%	0.000134	3.4
			Blower Purge Dryer	0.1%	20%	50%	15	2.9	L	1%	0.000134	9.6
			Regulated Compressed Air Nozzles	0.6%	50%	2%	15	16.1	L	1%	0.000134	11.5
			Compressed Air Storage Tank	0.7%	50%	2%	15	18.9	L	1%	0.000134	11.5
			Compressed Air System Design/Control	0.7%	80%	20%	15	18.9	L	1%	0.000134	3.2
			Process - Swap CA Tools For Electric Ones	0.7%	70%	50%	10	18.9	L	1%	0.000134	12.8
			Advanced Lubricants	0.1%	5%	3%	1	3.3	L	1%	0.000134	5.0
			Cooler Ambient Temperature (-11 Of)	0.7%	5%	1%	20	18.9	L	1%	0.000134	10.3
			Cycling Air Dryer	0.2%	25%	50%	10	4.8	L	1%	0.000134	3.4
			Duct In Outside Air To Compressor	0.5%	10%	2%	20	14.5	L	1%	0.000134	10.3
			Oil Temperature Control	0.3%	33%	2%	10	7.3	M	3%	0.000134	1.4
			Compressed Air System Isolation	0.7%	20%	2%	15	18.9	O	3%	0.000134	1.3
			Compressed Air System Leak Repair	0.7%	50%	10%	2	18.9	O	3%	0.000134	4.3
			Eliminating Wasteful Uses	0.7%	50%	1%	5	18.9	O	3%	0.000134	4.0
			Reduce Operating Pressure Of Compressed Air System	0.7%	50%	3%	20	18.9	O	3%	0.000134	12.9
			Regular Maintenance	0.7%	50%	5%	1	18.9	O	3%	0.000134	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.1	O	3%	0.000134	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.1	O	3%	0.000134	4.0
			Air Compressor System Management	0.7%	25%	20%	2	18.9	O	3%	0.000134	0.4
			Advanced Air Compression Controls	0.6%	30%	4%	15	16.1	O	3%	0.000134	1.3
			Electric Supply System Improvements	0.7%	10%	3%	5	18.9	M	3%	0.000134	5.5
			Night Shut Off For Compressor	0.5%	50%	10%	10	15.2	M	3%	0.000134	16.0
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	3.9%	50%	15%	2	107.7	M	3%	0.000134	5.9
			Energy Management System	3.9%	10%	10%	5	107.7	M	3%	0.000134	10.8
			HE (ES) Windows And Skylights	1.9%	5%	19%	15	53.9	L	1%	0.000134	0.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Metals Primary	Retrofit	HVAC	HVAC System By-Pass Timer	3.9%	50%	5%	5	107.7	L	1%	0.000134	3.8
			HVAC System Tune-Up/Maintenance	3.9%	20%	10%	5	107.7	L	1%	0.000134	0.1
			Improve Duct Sealing	3.9%	15%	7%	10	107.7	M	3%	0.000134	5.8
			Improved Below-Grade Insulation	1.9%	5%	10%	15	53.9	L	1%	0.000134	0.3
			Improved Roof/Ceiling Insulation	1.9%	5%	26%	15	53.9	L	1%	0.000134	0.9
			Improved Wall Insulation	1.9%	5%	26%	15	53.9	L	1%	0.000134	0.4
			Insulate Pipes/Lines	3.9%	80%	3%	5	107.7	M	3%	0.000134	6.5
			Thermostat Calibration	3.9%	10%	5%	5	107.7	L	1%	0.000134	14.0
			Ventilation Controls Installed	3.1%	5%	15%	5	86.2	L	1%	0.000134	28.6
			Cool Roofs And Exterior Walls	3.9%	2%	12%	15	107.7	L	1%	0.000134	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	0.6%	50%	20%	10	17.2	M	3%	0.000134	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.4%	40%	30%	10	10.8	O	4%	0.000134	0.9
			HVAC System Retrocommissioning*	3.9%	0%	10%	5	107.7	L	1%	0.000134	0.1
			Programmable Thermostat	3.9%	50%	4%	5	107.7	L	1%	0.000134	14.0
			Time Clock	3.9%	10%	4%	5	107.7	L	1%	0.000134	14.0
		HVAC - Cooling	Electric Supply System Improvements	1.6%	10%	3%	5	43.8	L	1%	0.000134	5.5
			Chilled Water Free Cooling Controls And Equipments	0.6%	50%	30%	15	16.4	M	3%	0.000134	11.6
			Chilled Water Reset, Optimizer For Chiller(S)	1.6%	25%	5%	15	43.8	M	3%	0.000134	0.3
			Chiller Optimization Controls	1.6%	25%	5%	15	43.8	M	3%	0.000134	1.7
			Chiller, Early Retirement	1.6%	5%	5%	15	43.8	L	1%	0.000134	0.3
			Motor System Optimization (Incl. Resizing and Asd)	1.5%	5%	6%	10	41.0	M	3%	0.000134	0.9
			Economizer (Hydronic Or Outside Air)	0.4%	2%	20%	10	10.9	M	3%	0.000134	3.4
			Ultraviolet A/C Coil Cleaning System	0.4%	25%	4%	2	10.9	L	1%	0.000134	0.3
			Cooling Tower Optimization	0.2%	25%	5%	5	5.5	M	3%	0.000134	0.4
		Lighting	Replace T12 with HP T8/T5	1.6%	54%	46%	15	45.4	O	3%	0.000134	0.9
			Replace High Bay HID with T8 (70% conv)	0.6%	50%	22%	15	24.5	M	3%	0.000134	6.1
			Replace High Bay HID with PSMH (30% conv)	0.3%	59%	10%	15	24.5	O	0%	0.000134	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	1.4	O	3%	0.000134	6.1
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	1.4	O	0%	0.000134	0.8
			Replace Exterior HID with Induction Lighting	0.0%	2%	43%	15	1.4	L	1%	0.000134	1.2
			Replace Exterior HID with LED Lighting	0.0%	2%	60%	15	1.4	O	1%	0.000134	0.6
			Efficient Lighting Design/Layout	2.5%	80%	37%	11	68.1	M	3%	0.000134	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.0%	75%	40%	25	56.1	M	3%	0.000134	3.0
			Exterior Light Timers	0.6%	85%	30%	15	16.0	M	3%	0.000134	14.3
		Motors	Improved Sensors And Process Controls	9.6%	40%	3%	10	266.0	M	3%	0.000134	1.5
			Fan System Efficiency Improvements	5.8%	10%	6%	10	159.6	M	3%	0.000134	4.9
			Pump System Efficiency Improvements	10.3%	10%	16%	10	283.7	M	3%	0.000134	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	5.1%	25%	2%	5	141.9	O	3%	0.000134	1.2
			Motor Early Retirement	6.4%	60%	5%	10	177.3	M	3%	0.000134	4.9
			Advanced Lubricants and Drivetrain Maintenance	7.4%	5%	3%	1	203.9	M	3%	0.000134	13.3

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Metals Primary	Retrofit	Motors	Motor Optimization / Variable Speed Drives (Process Fans,	7.7%	60%	30%	15	212.8	O	3%	0.000134	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	3.2%	25%	2%	10	886.6	M	3%	0.000134	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	8.0%	40%	3%	2	886.6	M	3%	0.000134	4.1
			Improved Process Scheduling and Deenergizing Idle Mach	32.1%	25%	3%	5	886.6	L	1%	0.000134	10.2
			Process Rework and Scrap Reduction	32.1%	25%	3%	5	886.6	L	1%	0.000134	10.2
		Process Cooling	Improved Sensors And Process Controls	0.2%	40%	3%	10	6.6	M	3%	0.000134	2.1
			Advanced Lubricants	0.1%	5%	3%	1	2.5	H	4%	0.000134	5.0
			Electric Supply System Improvements	0.8%	10%	3%	5	22.1	M	3%	0.000134	5.5
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000134	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0.2%	50%	5%	10	6.6	M	3%	0.000134	0.6
			Condensate Evaporator	0.3%	10%	5%	10	8.3	M	3%	0.000134	1.9
			Defrost Control System	0.4%	25%	3%	10	11.0	M	3%	0.000134	4.8
			Desuperheaters	0.2%	10%	5%	10	5.5	M	3%	0.000134	8.8
			Economizer For Walk-In Coolers	0.0%	10%	10%	10	1.1	M	3%	0.000134	1.5
			Evaporate Pre-Cooler	0.2%	10%	5%	10	5.5	M	3%	0.000134	0.3
			Evaporator Fan Controller	0.2%	10%	1%	10	5.5	M	3%	0.000134	4.8
			Floating Head Pressure Control	0.4%	50%	5%	10	11.0	M	3%	0.000134	3.2
			Insulated Suction Lines	0.4%	50%	1%	5	11.0	H	4%	0.000134	1.2
			Liquid Pressure Amplifiers	0.4%	10%	5%	5	11.0	M	3%	0.000134	2.3
			Refrigeration System Maintenance	0.8%	25%	5%	3	22.1	M	3%	0.000134	8.1
			Repair Refrigerator/Freezer Leaks	0.8%	50%	10%	3	22.1	M	3%	0.000134	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.1%	0%	7%	15	2.2	M	3%	0.000134	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.1%	0%	4%	15	2.2	M	3%	0.000134	3.3
			VSD On Refrigeration Circulating Pump	0.4%	30%	30%	15	11.0	M	3%	0.000134	3.4
			VSD On Refrigeration Fan	0.4%	30%	30%	15	11.0	M	3%	0.000134	3.4
			Chiller Temperature Reset	0.8%	50%	1%	1	22.1	M	3%	0.000134	1.5
		Process Heating	Improved Sensors And Process Controls	28.1%	70%	8%	10	776.1	M	3%	0.000134	1.5
			Water Heater Cycling	0.7%	50%	15%	10	19.4	M	3%	0.000134	14.5
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1.1%	35%	2%	15	31.0	O	4%	0.000134	0.8
			Load Management (Process Changes)	28.1%	25%	2%	10	776.1	M	3%	0.000134	4.9
			Timers (Process Heating)	28.1%	70%	3%	10	776.1	M	3%	0.000134	9.1
			Heat Containment Improvements	7.0%	70%	5%	10	194.0	M	3%	0.000134	10.3
			Heat Transfer Improvements	7.0%	70%	5%	10	194.0	M	3%	0.000134	1.5
			Heat Recovery Improvements	28.1%	70%	5%	10	776.1	M	3%	0.000134	1.5
		Other	Advanced Lubricants	7.3%	5%	2%	1	200.7	M	3%	0.000134	4.9
			Electric Supply System Improvements	31.6%	10%	3%	5	872.8	M	3%	0.000134	5.4
	ROB	Air Compressior	Variable Displacement Compressor	0.4%	30%	10%	15	0.8	L	6%	0.000134	0.8
		HVAC	Destratification Fans	0.4%	20%	20%	10	1.2	M	18%	0.000134	0.9
			HE Heat Pumps, Including Geothermal	0.6%	33%	8%	15	1.3	L	6%	0.000134	0.7
			HE HVAC System Design	3.1%	10%	8%	15	6.6	L	6%	0.000134	1.1

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Metals Primary	ROB	HVAC	Industrial Air Curtains	0.6%	80%	2%	5	3.6	M	18%	0.000134	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	1.6%	10%	12%	15	3.4	L	6%	0.000134	5.2
			Heat Reclaim Absorption Chillers	0.1%	1%	90%	15	0.2	L	6%	0.000134	7.2
			HE Packaged AC	0.4%	20%	25%	10	1.2	M	18%	0.000134	5.7
			HE Rooftop Ac Systems	0.4%	10%	25%	10	1.2	M	18%	0.000134	5.7
		Motors	Motor - Nema Premium Efficiency	6.4%	50%	2%	25	8.9	O	1%	0.000134	2.0
				9.6%	50%	2%	25	13.3	O	1%	0.000134	2.0
				16.0%	50%	2%	25	22.2	O	1%	0.000134	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	3.2%	10%	67%	15	68.0	L	6%	0.000134	0.8
		Process Cooling	Energy Efficient Equipment	0.8%	50%	1%	20	1.3	M	18%	0.000134	0.5
			HE Compressors	0.4%	50%	8%	15	0.8	L	6%	0.000134	2.8
			HE Condensers	0.4%	50%	2%	15	0.8	L	6%	0.000134	2.8
			Cooling Tower Free Cooling	0.8%	50%	1%	10	2.4	M	18%	0.000134	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	1.0%	5%	2%	8	3.7	M	18%	0.000134	0.5
			Electric Curing - Replacement with more Efficient Technolo	1.0%	5%	2%	15	2.1	M	18%	0.000134	0.6
			Emmissions RTO - Reduce Head Loss Through Media	2.8%	50%	2%	5	16.3	M	18%	0.000134	4.2
		Other	Motor - Nema Premium Efficiency	31.6%	50%	1%	25	43.6	O	1%	0.000134	2.0
			Transformers (Nema Tier Ii)	6.3%	5%	3%	30	7.6	M	18%	0.000134	0.2
Other	NC	HVAC	Air Sealing	7.1%	5%	17%	15	2.2	L	6%	0.000157	1.2
			HE (ES) Building Design	8.8%	2%	30%	15	2.8	L	6%	0.000157	1.0
			HE (ES) Windows And Skylights	4.4%	5%	19%	15	1.4	L	6%	0.000157	0.2
			HVAC System Commissioning	8.8%	0%	10%	5	2.8	L	6%	0.000157	0.1
			Improved Below-Grade Insulation	4.4%	5%	10%	15	1.4	L	6%	0.000157	0.3
			Improved Roof/Ceiling Insulation	4.4%	5%	26%	15	1.4	L	6%	0.000157	0.9
			Improved Wall Insulation	4.4%	5%	26%	15	1.4	L	6%	0.000157	0.4
			Cool Roofs And Exterior Walls	8.8%	2%	12%	15	2.8	L	6%	0.000157	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3.7%	10%	12%	15	1.2	M	18%	0.000157	5.3
		Lighting	Replace T12 with HP T8/T5	3.7%	54%	49%	15	1.2	O	3%	0.000157	2.2
			Replace High Bay HID with T8 (70% conv)	1.3%	50%	22%	15	0.6	H	36%	0.000157	20.0
			Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	0.6	H	36%	0.000157	3.2
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000157	20.0
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000157	3.2
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000157	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000157	2.9
			Efficient Lighting Design/Layout	5.5%	80%	37%	11	1.7	H	36%	0.000157	1.9
			Interior Lighting Timers/Elapsed Time Switching	4.5%	75%	40%	25	1.4	H	36%	0.000157	3.1
			Exterior Light Timers	1.3%	85%	30%	15	0.4	M	18%	0.000157	14.4
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	1.1%	60%	10%	15	35.7	O	2%	0.000157	0.3
			VSD For Air Compressor Motors	0.6%	30%	10%	15	35.7	M	3%	0.000157	3.4
			Blower Purge Dryer	0.2%	20%	50%	15	7.1	L	1%	0.000157	9.6

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Other	Retrofit	Air Compression	Regulated Compressed Air Nozzles	1.3%	50%	2%	15	39.7	L	1%	0.000157	11.6
			Compressed Air Storage Tank	1.5%	50%	2%	15	46.7	L	1%	0.000157	11.6
			Compressed Air System Design/Control	1.5%	80%	20%	15	46.7	L	1%	0.000157	3.2
			Process - Swap CA Tools For Electric Ones	1.5%	70%	50%	10	46.7	L	1%	0.000157	12.9
			Advanced Lubricants	0.3%	5%	3%	1	8.2	L	1%	0.000157	5.0
			Cooler Ambient Temperature (-11 Of)	1.5%	5%	1%	20	46.7	L	1%	0.000157	10.4
			Cycling Air Dryer	0.4%	25%	50%	10	11.9	L	1%	0.000157	3.4
			Duct In Outside Air To Compressor	1.1%	10%	2%	20	35.7	L	1%	0.000157	10.4
			Oil Temperature Control	0.6%	33%	2%	10	17.9	M	3%	0.000157	1.4
			Compressed Air System Isolation	1.5%	20%	2%	15	46.7	O	3%	0.000157	1.3
			Compressed Air System Leak Repair	1.5%	50%	10%	2	46.7	O	3%	0.000157	4.3
			Eliminating Wasteful Uses	1.5%	50%	1%	5	46.7	O	3%	0.000157	4.0
			Reduce Operating Pressure Of Compressed Air System	1.5%	50%	3%	20	46.7	O	3%	0.000157	13.0
			Regular Maintenance	1.5%	50%	5%	1	46.7	O	3%	0.000157	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.2	O	3%	0.000157	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.2	O	3%	0.000157	4.0
			Air Compressor System Management	1.5%	25%	20%	2	46.7	O	3%	0.000157	0.4
			Advanced Air Compression Controls	1.3%	30%	4%	15	39.7	O	3%	0.000157	1.3
			Electric Supply System Improvements	1.5%	10%	3%	5	46.7	M	3%	0.000157	5.6
			Night Shut Off For Compressor	1.2%	50%	10%	10	37.4	M	3%	0.000157	16.1
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	8.8%	50%	15%	2	279.6	M	3%	0.000157	6.0
			Energy Management System	8.8%	10%	10%	5	279.6	M	3%	0.000157	10.9
			HE (ES) Windows And Skylights	4.4%	5%	19%	15	139.8	L	1%	0.000157	0.2
			HVAC System By-Pass Timer	8.8%	50%	5%	5	279.6	L	1%	0.000157	3.8
			HVAC System Tune-Up/Maintenance	8.8%	20%	10%	5	279.6	L	1%	0.000157	0.1
			Improve Duct Sealing	8.8%	15%	7%	10	279.6	M	3%	0.000157	5.9
			Improved Below-Grade Insulation	4.4%	5%	10%	15	139.8	L	1%	0.000157	0.3
			Improved Roof/Ceiling Insulation	4.4%	5%	26%	15	139.8	L	1%	0.000157	0.9
			Improved Wall Insulation	4.4%	5%	26%	15	139.8	L	1%	0.000157	0.4
			Insulate Pipes/Lines	8.8%	80%	3%	5	279.6	M	3%	0.000157	6.6
			Thermostat Calibration	8.8%	10%	5%	5	279.6	L	1%	0.000157	14.2
			Ventilation Controls Installed	7.1%	5%	15%	5	223.7	L	1%	0.000157	28.9
			Cool Roofs And Exterior Walls	8.8%	2%	12%	15	279.6	L	1%	0.000157	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.4%	50%	20%	10	44.7	M	3%	0.000157	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.9%	40%	30%	10	28.0	O	4%	0.000157	0.9
			HVAC System Retrocommissioning*	8.8%	0%	10%	5	279.6	L	1%	0.000157	0.1
			Programmable Thermostat	8.8%	50%	4%	5	279.6	L	1%	0.000157	14.2
			Time Clock	8.8%	10%	4%	5	279.6	L	1%	0.000157	14.2
		HVAC - Cooling	Electric Supply System Improvements	3.7%	10%	3%	5	115.6	L	1%	0.000157	5.6
			Chilled Water Free Cooling Controls And Equipments	1.4%	50%	30%	15	43.4	M	3%	0.000157	11.7

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Other	Retrofit	HVAC - Cooling	Chilled Water Reset, Optimizer For Chiller(S)	3.7%	25%	5%	15	115.6	M	3%	0.000157	0.3
			Chiller Optimization Controls	3.7%	25%	5%	15	115.6	M	3%	0.000157	1.7
			Chiller, Early Retirement	3.7%	5%	5%	15	115.6	L	1%	0.000157	0.3
			Motor System Optimization (Incl. Resizing and Asd)	3.4%	5%	6%	10	108.4	M	3%	0.000157	0.9
			Economizer (Hydronic Or Outside Air)	0.9%	2%	20%	10	28.9	M	3%	0.000157	3.4
			Ultraviolet A/C Coil Cleaning System	0.9%	25%	4%	2	28.9	L	1%	0.000157	0.3
			Cooling Tower Optimization	0.5%	25%	5%	5	14.5	M	3%	0.000157	0.4
		Lighting	Replace T12 with HP T8/T5	3.7%	54%	46%	15	117.1	O	3%	0.000157	0.9
			Replace High Bay HID with T8 (70% conv)	1.3%	50%	22%	15	60.4	M	3%	0.000157	6.2
			Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	60.4	O	0%	0.000157	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	3.4	O	3%	0.000157	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	3.4	O	0%	0.000157	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	3.4	L	1%	0.000157	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	3.4	O	1%	0.000157	0.6
			Efficient Lighting Design/Layout	5.5%	80%	37%	11	172.9	M	3%	0.000157	1.9
			Interior Lighting Timers/Elapsed Time Switching	4.5%	75%	40%	25	142.4	M	3%	0.000157	3.1
			Exterior Light Timers	1.3%	85%	30%	15	40.7	M	3%	0.000157	14.4
		Motors	Improved Sensors And Process Controls	15.9%	40%	3%	10	505.2	M	3%	0.000157	1.5
			Fan System Efficiency Improvements	9.6%	10%	6%	10	303.1	M	3%	0.000157	5.0
			Pump System Efficiency Improvements	21.3%	10%	16%	10	673.6	M	3%	0.000157	5.0
			Trim Existing Pump Impeller To More Closely Match Syster	10.6%	25%	2%	5	336.8	O	3%	0.000157	1.2
			Motor Early Retirement	10.6%	60%	5%	10	336.8	M	3%	0.000157	5.0
			Advanced Lubricants and Drivetrain Maintenance	12.2%	5%	3%	1	387.3	M	3%	0.000157	13.4
			Motor Optimization / Variable Speed Drives (Process Fans,	15.4%	60%	30%	15	488.4	O	3%	0.000157	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	5.3%	25%	2%	10	1684.1	M	3%	0.000157	4.0
			Use of Energy Efficient Belts and Other Improved Mechani	13.3%	40%	3%	2	1684.1	M	3%	0.000157	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	53.2%	25%	3%	5	1684.1	L	1%	0.000157	10.3
			Process Rework and Scrap Reduction	53.2%	25%	3%	5	1684.1	L	1%	0.000157	10.3
		Process Cooling	Improved Sensors And Process Controls	2.0%	40%	3%	10	62.0	M	3%	0.000157	2.1
			Advanced Lubricants	0.7%	5%	3%	1	23.8	H	4%	0.000157	5.0
			Electric Supply System Improvements	6.5%	10%	3%	5	206.5	M	3%	0.000157	5.6
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000157	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	2.0%	50%	5%	10	62.0	M	3%	0.000157	0.6
			Condensate Evaporator	2.4%	10%	5%	10	77.5	M	3%	0.000157	1.9
			Defrost Control System	3.3%	25%	3%	10	103.3	M	3%	0.000157	4.8
			Desuperheaters	1.6%	10%	5%	10	51.6	M	3%	0.000157	8.8
			Economizer For Walk-In Coolers	0.3%	10%	10%	10	10.3	M	3%	0.000157	1.5
			Evaporate Pre-Cooler	1.6%	10%	5%	10	51.6	M	3%	0.000157	0.3
			Evaporator Fan Controller	1.6%	10%	1%	10	51.6	M	3%	0.000157	4.8
			Floating Head Pressure Control	3.3%	50%	5%	10	103.3	M	3%	0.000157	3.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Other	Retrofit	Process Cooling	Insulated Suction Lines	3.3%	50%	1%	5	103.3	H	4%	0.000157	1.2
			Liquid Pressure Amplifiers	3.3%	10%	5%	5	103.3	M	3%	0.000157	2.4
			Refrigeration System Maintenance	6.5%	25%	5%	3	206.5	M	3%	0.000157	8.2
			Repair Refrigerator/Freezer Leaks	6.5%	50%	10%	3	206.5	M	3%	0.000157	8.2
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.7%	0%	7%	15	20.7	M	3%	0.000157	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.7%	0%	4%	15	20.7	M	3%	0.000157	3.4
			VSD On Refrigeration Circulating Pump	3.3%	30%	30%	15	103.3	M	3%	0.000157	3.4
			VSD On Refrigeration Fan	3.3%	30%	30%	15	103.3	M	3%	0.000157	3.4
			Chiller Temperature Reset	6.5%	50%	1%	1	206.5	M	3%	0.000157	1.5
		Process Heating	Improved Sensors And Process Controls	10.8%	70%	8%	10	343.2	M	3%	0.000157	1.5
			Water Heater Cycling	0.1%	50%	15%	10	4.3	M	3%	0.000157	14.7
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.2%	35%	2%	15	6.9	O	4%	0.000157	0.8
			Load Management (Process Changes)	10.8%	25%	2%	10	343.2	M	3%	0.000157	5.0
			Timers (Process Heating)	10.8%	70%	3%	10	343.2	M	3%	0.000157	9.2
			Heat Containment Improvements	2.7%	70%	5%	10	85.8	M	3%	0.000157	10.4
			Heat Transfer Improvements	2.7%	70%	5%	10	85.8	M	3%	0.000157	1.5
			Heat Recovery Improvements	10.8%	70%	5%	10	343.2	M	3%	0.000157	1.5
		Other	Advanced Lubricants	2.9%	5%	2%	1	92.8	M	3%	0.000157	4.9
			Electric Supply System Improvements	12.7%	10%	3%	5	403.5	M	3%	0.000157	5.5
	ROB	Air Compression	Variable Displacement Compressor	0.8%	30%	10%	15	2.1	L	6%	0.000157	0.8
		HVAC	Destratification Fans	0.9%	20%	20%	10	3.1	M	18%	0.000157	0.9
			HE Heat Pumps, Including Geothermal	1.4%	33%	8%	15	3.4	L	6%	0.000157	0.7
			HE HVAC System Design	7.1%	10%	8%	15	17.1	L	6%	0.000157	1.1
			Industrial Air Curtains	1.4%	80%	2%	5	9.4	M	18%	0.000157	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3.7%	10%	12%	15	8.9	L	6%	0.000157	5.3
			Heat Reclaim Absorption Chillers	0.2%	1%	90%	15	0.6	L	6%	0.000157	7.2
			HE Packaged AC	0.9%	20%	25%	10	3.2	M	18%	0.000157	5.7
			HE Rooftop Ac Systems	0.9%	10%	25%	10	3.2	M	18%	0.000157	5.7
		Motors	Motor - Nema Premium Efficiency	10.6%	50%	2%	25	16.8	O	1%	0.000157	2.0
				15.9%	50%	2%	25	25.3	O	1%	0.000157	2.0
				26.6%	50%	2%	25	42.1	O	1%	0.000157	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	5.3%	10%	67%	15	129.1	L	6%	0.000157	0.8
		Process Cooling	Energy Efficient Equipment	6.5%	50%	1%	20	12.4	M	18%	0.000157	0.5
			HE Compressors	3.3%	50%	8%	15	7.9	L	6%	0.000157	2.9
			HE Condensers	3.3%	50%	2%	15	7.9	L	6%	0.000157	2.9
			Cooling Tower Free Cooling	6.5%	50%	1%	10	22.7	M	18%	0.000157	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.2%	5%	2%	8	0.8	M	18%	0.000157	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.2%	5%	2%	15	0.5	M	18%	0.000157	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.5%	50%	2%	5	3.6	M	18%	0.000157	4.3
		Other	Motor - Nema Premium Efficiency	12.7%	50%	1%	25	20.2	O	1%	0.000157	2.0

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Other	ROB	Other	Transformers (Nema Tier Ii)	2.5%	5%	3%	30	3.5	M	18%	0.000157	0.2
Plastics and Rubber	NC	HVAC	Air Sealing	8.2%	5%	17%	15	1.0	L	6%	0.000138	1.2
			HE (ES) Building Design	10.2%	2%	30%	15	1.3	L	6%	0.000138	1.0
			HE (ES) Windows And Skylights	5.1%	5%	19%	15	0.6	L	6%	0.000138	0.2
			HVAC System Commissioning	10.2%	0%	10%	5	1.3	L	6%	0.000138	0.1
			Improved Below-Grade Insulation	5.1%	5%	10%	15	0.6	L	6%	0.000138	0.3
			Improved Roof/Ceiling Insulation	5.1%	5%	26%	15	0.6	L	6%	0.000138	0.9
			Improved Wall Insulation	5.1%	5%	26%	15	0.6	L	6%	0.000138	0.4
			Cool Roofs And Exterior Walls	10.2%	2%	12%	15	1.3	L	6%	0.000138	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4.3%	10%	12%	15	0.5	M	18%	0.000138	5.3
		Lighting	Replace T12 with HP T8/T5	4.6%	54%	49%	15	0.6	O	3%	0.000138	2.1
			Replace High Bay HID with T8 (70% conv)	1.7%	50%	22%	15	0.3	H	36%	0.000138	19.9
			Replace High Bay HID with PSMH (30% conv)	0.7%	59%	10%	15	0.3	H	36%	0.000138	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000138	19.9
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000138	3.1
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000138	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000138	2.9
			Efficient Lighting Design/Layout	6.9%	80%	37%	11	0.9	H	36%	0.000138	1.9
			Interior Lighting Timers/Elapsed Time Switching	5.7%	75%	40%	25	0.7	H	36%	0.000138	3.0
			Exterior Light Timers	1.6%	85%	30%	15	0.2	M	18%	0.000138	14.3
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	1.8%	60%	10%	15	22.9	O	2%	0.000138	0.3
			VSD For Air Compressor Motors	0.9%	30%	10%	15	22.9	M	3%	0.000138	3.4
			Blower Purge Dryer	0.4%	20%	50%	15	4.6	L	1%	0.000138	9.6
			Regulated Compressed Air Nozzles	2.0%	50%	2%	15	25.4	L	1%	0.000138	11.5
			Compressed Air Storage Tank	2.4%	50%	2%	15	29.9	L	1%	0.000138	11.5
			Compressed Air System Design/Control	2.4%	80%	20%	15	29.9	L	1%	0.000138	3.2
			Process - Swap CA Tools For Electric Ones	2.4%	70%	50%	10	29.9	L	1%	0.000138	12.8
			Advanced Lubricants	0.4%	5%	3%	1	5.3	L	1%	0.000138	5.0
			Cooler Ambient Temperature (-11 Of)	2.4%	5%	1%	20	29.9	L	1%	0.000138	10.3
			Cycling Air Dryer	0.6%	25%	50%	10	7.6	L	1%	0.000138	3.4
			Duct In Outside Air To Compressor	1.8%	10%	2%	20	22.9	L	1%	0.000138	10.3
			Oil Temperature Control	0.9%	33%	2%	10	11.4	M	3%	0.000138	1.4
			Compressed Air System Isolation	2.4%	20%	2%	15	29.9	O	3%	0.000138	1.3
			Compressed Air System Leak Repair	2.4%	50%	10%	2	29.9	O	3%	0.000138	4.3
			Eliminating Wasteful Uses	2.4%	50%	1%	5	29.9	O	3%	0.000138	4.0
			Reduce Operating Pressure Of Compressed Air System	2.4%	50%	3%	20	29.9	O	3%	0.000138	12.9
			Regular Maintenance	2.4%	50%	5%	1	29.9	O	3%	0.000138	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.1	O	3%	0.000138	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.1	O	3%	0.000138	4.0

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Plastics and	Retrofit	Air Compressior	Air Compressor System Management	2.4%	25%	20%	2	29.9	O	3%	0.000138	0.4
			Advanced Air Compression Controls	2.0%	30%	4%	15	25.4	O	3%	0.000138	1.3
			Electric Supply System Improvements	2.4%	10%	3%	5	29.9	M	3%	0.000138	5.5
			Night Shut Off For Compressor	1.9%	50%	10%	10	23.9	M	3%	0.000138	16.0
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	10.2%	50%	15%	2	129.6	M	3%	0.000138	5.9
			Energy Management System	10.2%	10%	10%	5	129.6	M	3%	0.000138	10.9
			HE (ES) Windows And Skylights	5.1%	5%	19%	15	64.8	L	1%	0.000138	0.2
			HVAC System By-Pass Timer	10.2%	50%	5%	5	129.6	L	1%	0.000138	3.8
			HVAC System Tune-Up/Maintenance	10.2%	20%	10%	5	129.6	L	1%	0.000138	0.1
			Improve Duct Sealing	10.2%	15%	7%	10	129.6	M	3%	0.000138	5.8
			Improved Below-Grade Insulation	5.1%	5%	10%	15	64.8	L	1%	0.000138	0.3
			Improved Roof/Ceiling Insulation	5.1%	5%	26%	15	64.8	L	1%	0.000138	0.9
			Improved Wall Insulation	5.1%	5%	26%	15	64.8	L	1%	0.000138	0.4
			Insulate Pipes/Lines	10.2%	80%	3%	5	129.6	M	3%	0.000138	6.5
			Thermostat Calibration	10.2%	10%	5%	5	129.6	L	1%	0.000138	14.1
			Ventilation Controls Installed	8.2%	5%	15%	5	103.7	L	1%	0.000138	28.7
			Cool Roofs And Exterior Walls	10.2%	2%	12%	15	129.6	L	1%	0.000138	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.6%	50%	20%	10	20.7	M	3%	0.000138	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	1.0%	40%	30%	10	13.0	O	4%	0.000138	0.9
			HVAC System Retrocommissioning*	10.2%	0%	10%	5	129.6	L	1%	0.000138	0.1
			Programmable Thermostat	10.2%	50%	4%	5	129.6	L	1%	0.000138	14.1
			Time Clock	10.2%	10%	4%	5	129.6	L	1%	0.000138	14.1
		HVAC - Cooling	Electric Supply System Improvements	4.3%	10%	3%	5	53.9	L	1%	0.000138	5.5
			Chilled Water Free Cooling Controls And Equipments	1.6%	50%	30%	15	20.2	M	3%	0.000138	11.6
			Chilled Water Reset, Optimizer For Chiller(S)	4.3%	25%	5%	15	53.9	M	3%	0.000138	0.3
			Chiller Optimization Controls	4.3%	25%	5%	15	53.9	M	3%	0.000138	1.7
			Chiller, Early Retirement	4.3%	5%	5%	15	53.9	L	1%	0.000138	0.3
			Motor System Optimization (Incl. Resizing and Asd)	4.0%	5%	6%	10	50.5	M	3%	0.000138	0.9
			Economizer (Hydronic Or Outside Air)	1.1%	2%	20%	10	13.5	M	3%	0.000138	3.4
			Ultraviolet A/C Coil Cleaning System	1.1%	25%	4%	2	13.5	L	1%	0.000138	0.3
			Cooling Tower Optimization	0.5%	25%	5%	5	6.7	M	3%	0.000138	0.4
		Lighting	Replace T12 with HP T8/T5	4.6%	54%	46%	15	58.4	O	3%	0.000138	0.9
			Replace High Bay HID with T8 (70% conv)	1.7%	50%	22%	15	31.5	M	3%	0.000138	6.1
			Replace High Bay HID with PSMH (30% conv)	0.7%	59%	10%	15	31.5	O	0%	0.000138	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	1.8	O	3%	0.000138	6.1
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	1.8	O	0%	0.000138	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	1.8	L	1%	0.000138	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	1.8	O	1%	0.000138	0.6
			Efficient Lighting Design/Layout	6.9%	80%	37%	11	87.5	M	3%	0.000138	1.9
			Interior Lighting Timers/Elapsed Time Switching	5.7%	75%	40%	25	72.1	M	3%	0.000138	3.0

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Plastics and	Retrofit	Lighting	Exterior Light Timers	1.6%	85%	30%	15	20.6	M	3%	0.000138	14.3
		Motors	Improved Sensors And Process Controls	16.2%	40%	3%	10	205.1	M	3%	0.000138	1.5
			Fan System Efficiency Improvements	9.7%	10%	6%	10	123.1	M	3%	0.000138	4.9
			Pump System Efficiency Improvements	17.3%	10%	16%	10	218.8	M	3%	0.000138	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	8.6%	25%	2%	5	109.4	O	3%	0.000138	1.2
			Motor Early Retirement	10.8%	60%	5%	10	136.8	M	3%	0.000138	4.9
			Advanced Lubricants and Drivetrain Maintenance	12.4%	5%	3%	1	157.3	M	3%	0.000138	13.3
			Motor Optimization / Variable Speed Drives (Process Fans,	15.6%	60%	30%	15	198.3	O	3%	0.000138	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	5.4%	25%	2%	10	683.8	M	3%	0.000138	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	13.5%	40%	3%	2	683.8	M	3%	0.000138	4.1
			Improved Process Scheduling and Deenergizing Idle Mach	54.0%	25%	3%	5	683.8	L	1%	0.000138	10.3
			Process Rework and Scrap Reduction	54.0%	25%	3%	5	683.8	L	1%	0.000138	10.3
		Process Cooling	Improved Sensors And Process Controls	2.5%	40%	3%	10	31.6	M	3%	0.000138	2.1
			Advanced Lubricants	1.0%	5%	3%	1	12.1	H	4%	0.000138	5.0
			Electric Supply System Improvements	8.3%	10%	3%	5	105.5	M	3%	0.000138	5.5
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000138	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	2.5%	50%	5%	10	31.6	M	3%	0.000138	0.6
			Condensate Evaporator	3.1%	10%	5%	10	39.6	M	3%	0.000138	1.9
			Defrost Control System	4.2%	25%	3%	10	52.7	M	3%	0.000138	4.8
			Desuperheaters	2.1%	10%	5%	10	26.4	M	3%	0.000138	8.8
			Economizer For Walk-In Coolers	0.4%	10%	10%	10	5.3	M	3%	0.000138	1.5
			Evaporate Pre-Cooler	2.1%	10%	5%	10	26.4	M	3%	0.000138	0.3
			Evaporator Fan Controller	2.1%	10%	1%	10	26.4	M	3%	0.000138	4.8
			Floating Head Pressure Control	4.2%	50%	5%	10	52.7	M	3%	0.000138	3.2
			Insulated Suction Lines	4.2%	50%	1%	5	52.7	H	4%	0.000138	1.2
			Liquid Pressure Amplifiers	4.2%	10%	5%	5	52.7	M	3%	0.000138	2.3
			Refrigeration System Maintenance	8.3%	25%	5%	3	105.5	M	3%	0.000138	8.1
			Repair Refrigerator/Freezer Leaks	8.3%	50%	10%	3	105.5	M	3%	0.000138	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.8%	0%	7%	15	10.5	M	3%	0.000138	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.8%	0%	4%	15	10.5	M	3%	0.000138	3.3
			VSD On Refrigeration Circulating Pump	4.2%	30%	30%	15	52.7	M	3%	0.000138	3.4
			VSD On Refrigeration Fan	4.2%	30%	30%	15	52.7	M	3%	0.000138	3.4
			Chiller Temperature Reset	8.3%	50%	1%	1	105.5	M	3%	0.000138	1.5
		Process Heating	Improved Sensors And Process Controls	15.4%	70%	8%	10	195.7	M	3%	0.000138	1.5
			Water Heater Cycling	0.4%	50%	15%	10	4.9	M	3%	0.000138	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.6%	35%	2%	15	7.8	O	4%	0.000138	0.8
			Load Management (Process Changes)	15.4%	25%	2%	10	195.7	M	3%	0.000138	4.9
			Timers (Process Heating)	15.4%	70%	3%	10	195.7	M	3%	0.000138	9.1
			Heat Containment Improvements	3.9%	70%	5%	10	48.9	M	3%	0.000138	10.3
			Heat Transfer Improvements	3.9%	70%	5%	10	48.9	M	3%	0.000138	1.5

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Plastics and	Retrofit	Process Heating	Heat Recovery Improvements	15.4%	70%	5%	10	195.7	M	3%	0.000138	1.5
		Other	Advanced Lubricants	0.3%	5%	2%	1	4.4	M	3%	0.000138	4.9
			Electric Supply System Improvements	1.5%	10%	3%	5	19.1	M	3%	0.000138	5.4
	ROB	Air Compression	Variable Displacement Compressor	1.4%	30%	10%	15	1.3	L	6%	0.000138	0.8
		HVAC	Destratification Fans	1.0%	20%	20%	10	1.4	M	18%	0.000138	0.9
			HE Heat Pumps, Including Geothermal	1.6%	33%	8%	15	1.6	L	6%	0.000138	0.7
			HE HVAC System Design	8.2%	10%	8%	15	8.0	L	6%	0.000138	1.1
			Industrial Air Curtains	1.6%	80%	2%	5	4.4	M	18%	0.000138	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4.3%	10%	12%	15	4.1	L	6%	0.000138	5.3
			Heat Reclaim Absorption Chillers	0.3%	1%	90%	15	0.3	L	6%	0.000138	7.2
			HE Packaged AC	1.1%	20%	25%	10	1.5	M	18%	0.000138	5.7
			HE Rooftop Ac Systems	1.1%	10%	25%	10	1.5	M	18%	0.000138	5.7
		Motors	Motor - Nema Premium Efficiency	10.8%	50%	2%	25	6.8	O	1%	0.000138	2.0
				16.2%	50%	2%	25	10.3	O	1%	0.000138	2.0
				27.0%	50%	2%	25	17.1	O	1%	0.000138	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	5.4%	10%	67%	15	52.4	L	6%	0.000138	0.8
		Process Cooling	Energy Efficient Equipment	8.3%	50%	1%	20	6.3	M	18%	0.000138	0.5
			HE Compressors	4.2%	50%	8%	15	4.0	L	6%	0.000138	2.8
			HE Condensers	4.2%	50%	2%	15	4.0	L	6%	0.000138	2.8
			Cooling Tower Free Cooling	8.3%	50%	1%	10	11.6	M	18%	0.000138	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.5%	5%	2%	8	0.9	M	18%	0.000138	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.5%	5%	2%	15	0.5	M	18%	0.000138	0.6
			Emmissions RTO - Reduce Head Loss Through Media	1.5%	50%	2%	5	4.1	M	18%	0.000138	4.2
		Other	Motor - Nema Premium Efficiency	1.5%	50%	1%	25	1.0	O	1%	0.000138	2.0
			Transformers (Nema Tier Ii)	0.3%	5%	3%	30	0.2	M	18%	0.000138	0.2
Pulp and Paper	NC	HVAC	Air Sealing	5.6%	5%	17%	15	2.5	L	6%	0.000128	1.2
			HE (ES) Building Design	7.0%	2%	30%	15	3.2	L	6%	0.000128	1.0
			HE (ES) Windows And Skylights	3.5%	5%	19%	15	1.6	L	6%	0.000128	0.2
			HVAC System Commissioning	7.0%	0%	10%	5	3.2	L	6%	0.000128	0.1
			Improved Below-Grade Insulation	3.5%	5%	10%	15	1.6	L	6%	0.000128	0.3
			Improved Roof/Ceiling Insulation	3.5%	5%	26%	15	1.6	L	6%	0.000128	0.9
			Improved Wall Insulation	3.5%	5%	26%	15	1.6	L	6%	0.000128	0.4
			Cool Roofs And Exterior Walls	7.0%	2%	12%	15	3.2	L	6%	0.000128	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	1.8%	10%	12%	15	0.8	M	18%	0.000128	5.2
		Lighting	Replace T12 with HP T8/T5	2.3%	54%	49%	15	1.1	O	3%	0.000128	2.1
			Replace High Bay HID with T8 (70% conv)	0.8%	50%	22%	15	0.5	H	36%	0.000128	19.8
			Replace High Bay HID with PSMH (30% conv)	0.3%	59%	10%	15	0.5	H	36%	0.000128	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	0.0	H	36%	0.000128	19.8
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000128	3.1
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000128	2.7

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Pulp and Paper	NC	Lighting	Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000128	2.8
			Efficient Lighting Design/Layout	3.3%	80%	37%	11	1.5	H	36%	0.000128	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.7%	75%	40%	25	1.2	H	36%	0.000128	3.0
			Exterior Light Timers	0.8%	85%	30%	15	0.4	M	18%	0.000128	14.2
	Retrofit	Air Compressior	High Efficiency Air Compress (Upgrade)	0.5%	60%	10%	15	23.9	O	2%	0.000128	0.3
			VSD For Air Compressor Motors	0.3%	30%	10%	15	23.9	M	3%	0.000128	3.4
			Blower Purge Dryer	0.1%	20%	50%	15	4.8	L	1%	0.000128	9.5
			Regulated Compressed Air Nozzles	0.6%	50%	2%	15	26.5	L	1%	0.000128	11.4
			Compressed Air Storage Tank	0.7%	50%	2%	15	31.2	L	1%	0.000128	11.4
			Compressed Air System Design/Control	0.7%	80%	20%	15	31.2	L	1%	0.000128	3.2
			Process - Swap CA Tools For Electric Ones	0.7%	70%	50%	10	31.2	L	1%	0.000128	12.8
			Advanced Lubricants	0.1%	5%	3%	1	5.5	L	1%	0.000128	5.0
			Cooler Ambient Temperature (-11 Of)	0.7%	5%	1%	20	31.2	L	1%	0.000128	10.3
			Cycling Air Dryer	0.2%	25%	50%	10	8.0	L	1%	0.000128	3.4
			Duct In Outside Air To Compressor	0.5%	10%	2%	20	23.9	L	1%	0.000128	10.3
			Oil Temperature Control	0.3%	33%	2%	10	11.9	M	3%	0.000128	1.4
			Compressed Air System Isolation	0.7%	20%	2%	15	31.2	O	3%	0.000128	1.3
			Compressed Air System Leak Repair	0.7%	50%	10%	2	31.2	O	3%	0.000128	4.3
			Eliminating Wasteful Uses	0.7%	50%	1%	5	31.2	O	3%	0.000128	4.0
			Reduce Operating Pressure Of Compressed Air System	0.7%	50%	3%	20	31.2	O	3%	0.000128	12.9
			Regular Maintenance	0.7%	50%	5%	1	31.2	O	3%	0.000128	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.1	O	3%	0.000128	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.1	O	3%	0.000128	4.0
			Air Compressor System Management	0.7%	25%	20%	2	31.2	O	3%	0.000128	0.4
			Advanced Air Compression Controls	0.6%	30%	4%	15	26.5	O	3%	0.000128	1.3
			Electric Supply System Improvements	0.7%	10%	3%	5	31.2	M	3%	0.000128	5.5
			Night Shut Off For Compressor	0.5%	50%	10%	10	24.9	M	3%	0.000128	16.0
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	7.0%	50%	15%	2	318.2	M	3%	0.000128	5.9
			Energy Management System	7.0%	10%	10%	5	318.2	M	3%	0.000128	10.8
			HE (ES) Windows And Skylights	3.5%	5%	19%	15	159.1	L	1%	0.000128	0.2
			HVAC System By-Pass Timer	7.0%	50%	5%	5	318.2	L	1%	0.000128	3.8
			HVAC System Tune-Up/Maintenance	7.0%	20%	10%	5	318.2	L	1%	0.000128	0.1
			Improve Duct Sealing	7.0%	15%	7%	10	318.2	M	3%	0.000128	5.8
			Improved Below-Grade Insulation	3.5%	5%	10%	15	159.1	L	1%	0.000128	0.3
			Improved Roof/Ceiling Insulation	3.5%	5%	26%	15	159.1	L	1%	0.000128	0.9
			Improved Wall Insulation	3.5%	5%	26%	15	159.1	L	1%	0.000128	0.4
			Insulate Pipes/Lines	7.0%	80%	3%	5	318.2	M	3%	0.000128	6.5
			Thermostat Calibration	7.0%	10%	5%	5	318.2	L	1%	0.000128	14.0
			Ventilation Controls Installed	5.6%	5%	15%	5	254.6	L	1%	0.000128	28.6
			Cool Roofs And Exterior Walls	7.0%	2%	12%	15	318.2	L	1%	0.000128	0.1

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Pulp and Paper	Retrofit	HVAC	Controls Of Paint Or Spray Booth Exhaust/Supply System	1.1%	50%	20%	10	50.9	M	3%	0.000128	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.7%	40%	30%	10	31.8	O	4%	0.000128	0.9
			HVAC System Retrocommissioning*	7.0%	0%	10%	5	318.2	L	1%	0.000128	0.1
			Programmable Thermostat	7.0%	50%	4%	5	318.2	L	1%	0.000128	14.0
			Time Clock	7.0%	10%	4%	5	318.2	L	1%	0.000128	14.0
		HVAC - Cooling	Electric Supply System Improvements	1.8%	10%	3%	5	79.8	L	1%	0.000128	5.5
			Chilled Water Free Cooling Controls And Equipments	0.7%	50%	30%	15	29.9	M	3%	0.000128	11.6
			Chilled Water Reset, Optimizer For Chiller(S)	1.8%	25%	5%	15	79.8	M	3%	0.000128	0.3
			Chiller Optimization Controls	1.8%	25%	5%	15	79.8	M	3%	0.000128	1.7
			Chiller, Early Retirement	1.8%	5%	5%	15	79.8	L	1%	0.000128	0.3
			Motor System Optimization (Incl. Resizing and Asd)	1.6%	5%	6%	10	74.8	M	3%	0.000128	0.9
			Economizer (Hydronic Or Outside Air)	0.4%	2%	20%	10	20.0	M	3%	0.000128	3.4
			Ultraviolet A/C Coil Cleaning System	0.4%	25%	4%	2	20.0	L	1%	0.000128	0.3
			Cooling Tower Optimization	0.2%	25%	5%	5	10.0	M	3%	0.000128	0.4
		Lighting	Replace T12 with HP T8/T5	2.3%	54%	46%	15	105.3	O	3%	0.000128	0.9
			Replace High Bay HID with T8 (70% conv)	0.8%	50%	22%	15	51.1	M	3%	0.000128	6.1
			Replace High Bay HID with PSMH (30% conv)	0.3%	59%	10%	15	51.1	O	0%	0.000128	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	2.8	O	3%	0.000128	6.1
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	2.8	O	0%	0.000128	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	2.8	L	1%	0.000128	1.2
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	2.8	O	1%	0.000128	0.6
			Efficient Lighting Design/Layout	3.3%	80%	37%	11	150.7	M	3%	0.000128	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.7%	75%	40%	25	124.1	M	3%	0.000128	3.0
			Exterior Light Timers	0.8%	85%	30%	15	35.5	M	3%	0.000128	14.2
		Motors	Improved Sensors And Process Controls	24.2%	40%	3%	10	1102.0	M	3%	0.000128	1.5
			Fan System Efficiency Improvements	14.5%	10%	6%	10	661.2	M	3%	0.000128	4.9
			Pump System Efficiency Improvements	25.9%	10%	16%	10	1175.5	M	3%	0.000128	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	12.9%	25%	2%	5	587.7	O	3%	0.000128	1.2
			Motor Early Retirement	16.2%	60%	5%	10	734.7	M	3%	0.000128	4.9
			Advanced Lubricants and Drivetrain Maintenance	18.6%	5%	3%	1	844.9	M	3%	0.000128	13.3
			Motor Optimization / Variable Speed Drives (Process Fans	40.4%	60%	30%	15	1836.7	O	3%	0.000128	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	8.1%	25%	2%	10	3673.4	M	3%	0.000128	4.0
			Use of Energy Efficient Belts and Other Improved Mechani	20.2%	40%	3%	2	3673.4	M	3%	0.000128	4.1
			Improved Process Scheduling and Deenergizing Idle Mach	80.8%	25%	3%	5	3673.4	L	1%	0.000128	10.2
			Process Rework and Scrap Reduction	80.8%	25%	3%	5	3673.4	L	1%	0.000128	10.2
		Process Cooling	Improved Sensors And Process Controls	0.5%	40%	3%	10	20.5	M	3%	0.000128	2.1
			Advanced Lubricants	0.2%	5%	3%	1	7.8	H	4%	0.000128	5.0
			Electric Supply System Improvements	1.5%	10%	3%	5	68.2	M	3%	0.000128	5.5
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000128	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0.5%	50%	5%	10	20.5	M	3%	0.000128	0.6

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Pulp and Paper	Retrofit	Process Cooling	Condensate Evaporator	0.6%	10%	5%	10	25.6	M	3%	0.000128	1.9
			Defrost Control System	0.8%	25%	3%	10	34.1	M	3%	0.000128	4.8
			Desuperheaters	0.4%	10%	5%	10	17.0	M	3%	0.000128	8.7
			Economizer For Walk-In Coolers	0.1%	10%	10%	10	3.4	M	3%	0.000128	1.5
			Evaporate Pre-Cooler	0.4%	10%	5%	10	17.0	M	3%	0.000128	0.3
			Evaporator Fan Controller	0.4%	10%	1%	10	17.0	M	3%	0.000128	4.8
			Floating Head Pressure Control	0.8%	50%	5%	10	34.1	M	3%	0.000128	3.1
			Insulated Suction Lines	0.8%	50%	1%	5	34.1	H	4%	0.000128	1.2
			Liquid Pressure Amplifiers	0.8%	10%	5%	5	34.1	M	3%	0.000128	2.3
			Refrigeration System Maintenance	1.5%	25%	5%	3	68.2	M	3%	0.000128	8.1
			Repair Refrigerator/Freezer Leaks	1.5%	50%	10%	3	68.2	M	3%	0.000128	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.2%	0%	7%	15	6.8	M	3%	0.000128	5.6
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.2%	0%	4%	15	6.8	M	3%	0.000128	3.3
			VSD On Refrigeration Circulating Pump	0.8%	30%	30%	15	34.1	M	3%	0.000128	3.4
			VSD On Refrigeration Fan	0.8%	30%	30%	15	34.1	M	3%	0.000128	3.4
			Chiller Temperature Reset	1.5%	50%	1%	1	68.2	M	3%	0.000128	1.5
		Process Heating	Improved Sensors And Process Controls	2.5%	70%	8%	10	113.7	M	3%	0.000128	1.5
			Water Heater Cycling	0.2%	50%	15%	10	7.1	M	3%	0.000128	14.5
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.3%	35%	2%	15	11.4	O	4%	0.000128	0.8
			Load Management (Process Changes)	2.5%	25%	2%	10	113.7	M	3%	0.000128	4.9
			Timers (Process Heating)	2.5%	70%	3%	10	113.7	M	3%	0.000128	9.1
			Heat Containment Improvements	0.6%	70%	5%	10	28.4	M	3%	0.000128	10.3
			Heat Transfer Improvements	0.6%	70%	5%	10	28.4	M	3%	0.000128	1.5
			Heat Recovery Improvements	2.5%	70%	5%	10	113.7	M	3%	0.000128	1.5
		Other	Advanced Lubricants	0.8%	5%	2%	1	37.6	M	3%	0.000128	4.9
			Electric Supply System Improvements	3.6%	10%	3%	5	163.7	M	3%	0.000128	5.4
	ROB	Air Compressior	Variable Displacement Compressor	0.4%	30%	10%	15	1.4	L	6%	0.000128	0.8
		HVAC	Destratification Fans	0.7%	20%	20%	10	3.5	M	18%	0.000128	0.9
			HE Heat Pumps, Including Geothermal	1.1%	33%	8%	15	3.9	L	6%	0.000128	0.7
			HE HVAC System Design	5.6%	10%	8%	15	19.5	L	6%	0.000128	1.1
			Industrial Air Curtains	1.1%	80%	2%	5	10.7	M	18%	0.000128	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	1.8%	10%	12%	15	6.1	L	6%	0.000128	5.2
			Heat Reclaim Absorption Chillers	0.1%	1%	90%	15	0.4	L	6%	0.000128	7.1
			HE Packaged AC	0.4%	20%	25%	10	2.2	M	18%	0.000128	5.6
			HE Rooftop Ac Systems	0.4%	10%	25%	10	2.2	M	18%	0.000128	5.6
		Motors	Motor - Nema Premium Efficiency	16.2%	50%	2%	25	36.7	O	1%	0.000128	2.0
				24.2%	50%	2%	25	55.1	O	1%	0.000128	2.0
				40.4%	50%	2%	25	91.8	O	1%	0.000128	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	8.1%	10%	67%	15	281.6	L	6%	0.000128	0.8
		Process Cooling	Energy Efficient Equipment	1.5%	50%	1%	20	4.1	M	18%	0.000128	0.5

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Pulp and Paper	ROB	Process Cooling	HE Compressors	0.8%	50%	8%	15	2.6	L	6%	0.000128	2.8
			HE Condensers	0.8%	50%	2%	15	2.6	L	6%	0.000128	2.8
			Cooling Tower Free Cooling	1.5%	50%	1%	10	7.5	M	18%	0.000128	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.1%	5%	2%	8	0.4	M	18%	0.000128	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.1%	5%	2%	15	0.2	M	18%	0.000128	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.3%	50%	2%	5	2.4	M	18%	0.000128	4.2
		Other	Motor - Nema Premium Efficiency	3.6%	50%	1%	25	8.2	O	1%	0.000128	2.0
			Transformers (Nema Tier Ii)	0.7%	5%	3%	30	1.4	M	18%	0.000128	0.2
Transport Equipment	NC	HVAC	Air Sealing	15.7%	5%	17%	15	1.5	L	6%	0.000150	1.2
			HE (ES) Building Design	19.6%	2%	30%	15	1.9	L	6%	0.000150	1.0
			HE (ES) Windows And Skylights	9.8%	5%	19%	15	0.9	L	6%	0.000150	0.2
			HVAC System Commissioning	19.6%	0%	10%	5	1.9	L	6%	0.000150	0.1
			Improved Below-Grade Insulation	9.8%	5%	10%	15	0.9	L	6%	0.000150	0.3
			Improved Roof/Ceiling Insulation	9.8%	5%	26%	15	0.9	L	6%	0.000150	0.9
			Improved Wall Insulation	9.8%	5%	26%	15	0.9	L	6%	0.000150	0.4
			Cool Roofs And Exterior Walls	19.6%	2%	12%	15	1.9	L	6%	0.000150	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8.3%	10%	12%	15	0.8	M	18%	0.000150	5.3
		Lighting	Replace T12 with HP T8/T5	8.3%	54%	49%	15	0.8	O	3%	0.000150	2.2
			Replace High Bay HID with T8 (70% conv)	3.6%	50%	22%	15	0.5	H	36%	0.000150	20.0
			Replace High Bay HID with PSMH (30% conv)	1.6%	59%	10%	15	0.5	H	36%	0.000150	3.1
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.2%	59%	22%	15	0.0	H	36%	0.000150	20.0
			Replace Inefficient Non High Bay HID with PSMH	0.1%	59%	10%	15	0.0	H	36%	0.000150	3.1
			Replace Exterior HID with Induction Lighting	0.3%	2%	43%	15	0.0	L	6%	0.000150	2.7
			Replace Exterior HID with LED Lighting	0.3%	2%	60%	15	0.0	O	1%	0.000150	2.9
			Efficient Lighting Design/Layout	12.9%	80%	37%	11	1.2	H	36%	0.000150	1.9
			Interior Lighting Timers/Elapsed Time Switching	10.6%	75%	40%	25	1.0	H	36%	0.000150	3.0
			Exterior Light Timers	3.0%	85%	30%	15	0.3	M	18%	0.000150	14.3
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	2.6%	60%	10%	15	25.0	O	2%	0.000150	0.3
			VSD For Air Compressor Motors	1.3%	30%	10%	15	25.0	M	3%	0.000150	3.4
			Blower Purge Dryer	0.5%	20%	50%	15	5.0	L	1%	0.000150	9.6
			Regulated Compressed Air Nozzles	2.9%	50%	2%	15	27.8	L	1%	0.000150	11.5
			Compressed Air Storage Tank	3.4%	50%	2%	15	32.7	L	1%	0.000150	11.5
			Compressed Air System Design/Control	3.4%	80%	20%	15	32.7	L	1%	0.000150	3.2
			Process - Swap CA Tools For Electric Ones	3.4%	70%	50%	10	32.7	L	1%	0.000150	12.9
			Advanced Lubricants	0.6%	5%	3%	1	5.8	L	1%	0.000150	5.0
			Cooler Ambient Temperature (-11 Of)	3.4%	5%	1%	20	32.7	L	1%	0.000150	10.4
			Cycling Air Dryer	0.9%	25%	50%	10	8.3	L	1%	0.000150	3.4
			Duct In Outside Air To Compressor	2.6%	10%	2%	20	25.0	L	1%	0.000150	10.4
			Oil Temperature Control	1.3%	33%	2%	10	12.5	M	3%	0.000150	1.4

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Transport	Retrofit	Air Compressior	Compressed Air System Isolation	3.4%	20%	2%	15	32.7	O	3%	0.000150	1.3
			Compressed Air System Leak Repair	3.4%	50%	10%	2	32.7	O	3%	0.000150	4.3
			Eliminating Wasteful Uses	3.4%	50%	1%	5	32.7	O	3%	0.000150	4.0
			Reduce Operating Pressure Of Compressed Air System	3.4%	50%	3%	20	32.7	O	3%	0.000150	13.0
			Regular Maintenance	3.4%	50%	5%	1	32.7	O	3%	0.000150	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.1	O	3%	0.000150	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.1	O	3%	0.000150	4.0
			Air Compressor System Management	3.4%	25%	20%	2	32.7	O	3%	0.000150	0.4
			Advanced Air Compression Controls	2.9%	30%	4%	15	27.8	O	3%	0.000150	1.3
			Electric Supply System Improvements	3.4%	10%	3%	5	32.7	M	3%	0.000150	5.5
			Night Shut Off For Compressor	2.7%	50%	10%	10	26.2	M	3%	0.000150	16.1
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	19.6%	50%	15%	2	186.8	M	3%	0.000150	5.9
			Energy Management System	19.6%	10%	10%	5	186.8	M	3%	0.000150	10.9
			HE (ES) Windows And Skylights	9.8%	5%	19%	15	93.4	L	1%	0.000150	0.2
			HVAC System By-Pass Timer	19.6%	50%	5%	5	186.8	L	1%	0.000150	3.8
			HVAC System Tune-Up/Maintenance	19.6%	20%	10%	5	186.8	L	1%	0.000150	0.1
			Improve Duct Sealing	19.6%	15%	7%	10	186.8	M	3%	0.000150	5.8
			Improved Below-Grade Insulation	9.8%	5%	10%	15	93.4	L	1%	0.000150	0.3
			Improved Roof/Ceiling Insulation	9.8%	5%	26%	15	93.4	L	1%	0.000150	0.9
			Improved Wall Insulation	9.8%	5%	26%	15	93.4	L	1%	0.000150	0.4
			Insulate Pipes/Lines	19.6%	80%	3%	5	186.8	M	3%	0.000150	6.5
			Thermostat Calibration	19.6%	10%	5%	5	186.8	L	1%	0.000150	14.1
			Ventilation Controls Installed	15.7%	5%	15%	5	149.5	L	1%	0.000150	28.8
			Cool Roofs And Exterior Walls	19.6%	2%	12%	15	186.8	L	1%	0.000150	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	3.1%	50%	20%	10	29.9	M	3%	0.000150	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	2.0%	40%	30%	10	18.7	O	4%	0.000150	0.9
			HVAC System Retrocommissioning*	19.6%	0%	10%	5	186.8	L	1%	0.000150	0.1
			Programmable Thermostat	19.6%	50%	4%	5	186.8	L	1%	0.000150	14.1
			Time Clock	19.6%	10%	4%	5	186.8	L	1%	0.000150	14.1
		HVAC - Cooling	Electric Supply System Improvements	8.3%	10%	3%	5	79.2	L	1%	0.000150	5.5
			Chilled Water Free Cooling Controls And Equipments	3.1%	50%	30%	15	29.7	M	3%	0.000150	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	8.3%	25%	5%	15	79.2	M	3%	0.000150	0.3
			Chiller Optimization Controls	8.3%	25%	5%	15	79.2	M	3%	0.000150	1.7
			Chiller, Early Retirement	8.3%	5%	5%	15	79.2	L	1%	0.000150	0.3
			Motor System Optimization (Incl. Resizing and Asd)	7.8%	5%	6%	10	74.2	M	3%	0.000150	0.9
			Economizer (Hydronic Or Outside Air)	2.1%	2%	20%	10	19.8	M	3%	0.000150	3.4
			Ultraviolet A/C Coil Cleaning System	2.1%	25%	4%	2	19.8	L	1%	0.000150	0.3
			Cooling Tower Optimization	1.0%	25%	5%	5	9.9	M	3%	0.000150	0.4
		Lighting	Replace T12 with HP T8/T5	8.3%	54%	46%	15	79.5	O	3%	0.000150	0.9
			Replace High Bay HID with T8 (70% conv)	3.6%	50%	22%	15	49.6	M	3%	0.000150	6.2

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Transport	Retrofit	Lighting	Replace High Bay HID with PSMH (30% conv)	1.6%	59%	10%	15	49.6	O	0%	0.000150	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.2%	59%	22%	15	2.8	O	3%	0.000150	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.1%	59%	10%	15	2.8	O	0%	0.000150	0.8
			Replace Exterior HID with Induction Lighting	0.3%	2%	43%	15	2.8	L	1%	0.000150	1.3
			Replace Exterior HID with LED Lighting	0.3%	2%	60%	15	2.8	O	1%	0.000150	0.6
			Efficient Lighting Design/Layout	12.9%	80%	37%	11	123.2	M	3%	0.000150	1.9
			Interior Lighting Timers/Elapsed Time Switching	10.6%	75%	40%	25	101.4	M	3%	0.000150	3.0
			Exterior Light Timers	3.0%	85%	30%	15	29.0	M	3%	0.000150	14.3
		Motors	Improved Sensors And Process Controls	13.3%	40%	3%	10	126.4	M	3%	0.000150	1.5
			Fan System Efficiency Improvements	8.0%	10%	6%	10	75.8	M	3%	0.000150	4.9
			Pump System Efficiency Improvements	14.1%	10%	16%	10	134.8	M	3%	0.000150	4.9
			Trim Existing Pump Impeller To More Closely Match Syster	7.1%	25%	2%	5	67.4	O	3%	0.000150	1.2
			Motor Early Retirement	8.8%	60%	5%	10	84.3	M	3%	0.000150	4.9
			Advanced Lubricants and Drivetrain Maintenance	10.2%	5%	3%	1	96.9	M	3%	0.000150	13.4
			Motor Optimization / Variable Speed Drives (Process Fans	12.8%	60%	30%	15	122.2	O	3%	0.000150	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	4.4%	25%	2%	10	421.3	M	3%	0.000150	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	11.1%	40%	3%	2	421.3	M	3%	0.000150	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	44.2%	25%	3%	5	421.3	L	1%	0.000150	10.3
			Process Rework and Scrap Reduction	44.2%	25%	3%	5	421.3	L	1%	0.000150	10.3
		Process Cooling	Improved Sensors And Process Controls	1.4%	40%	3%	10	13.2	M	3%	0.000150	2.1
			Advanced Lubricants	0.5%	5%	3%	1	5.0	H	4%	0.000150	5.0
			Electric Supply System Improvements	4.6%	10%	3%	5	43.8	M	3%	0.000150	5.5
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000150	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1.4%	50%	5%	10	13.2	M	3%	0.000150	0.6
			Condensate Evaporator	1.7%	10%	5%	10	16.4	M	3%	0.000150	1.9
			Defrost Control System	2.3%	25%	3%	10	21.9	M	3%	0.000150	4.8
			Desuperheaters	1.2%	10%	5%	10	11.0	M	3%	0.000150	8.8
			Economizer For Walk-In Coolers	0.2%	10%	10%	10	2.2	M	3%	0.000150	1.5
			Evaporate Pre-Cooler	1.2%	10%	5%	10	11.0	M	3%	0.000150	0.3
			Evaporator Fan Controller	1.2%	10%	1%	10	11.0	M	3%	0.000150	4.8
			Floating Head Pressure Control	2.3%	50%	5%	10	21.9	M	3%	0.000150	3.2
			Insulated Suction Lines	2.3%	50%	1%	5	21.9	H	4%	0.000150	1.2
			Liquid Pressure Amplifiers	2.3%	10%	5%	5	21.9	M	3%	0.000150	2.4
			Refrigeration System Maintenance	4.6%	25%	5%	3	43.8	M	3%	0.000150	8.1
			Repair Refrigerator/Freezer Leaks	4.6%	50%	10%	3	43.8	M	3%	0.000150	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.5%	0%	7%	15	4.4	M	3%	0.000150	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.5%	0%	4%	15	4.4	M	3%	0.000150	3.4
			VSD On Refrigeration Circulating Pump	2.3%	30%	30%	15	21.9	M	3%	0.000150	3.4
			VSD On Refrigeration Fan	2.3%	30%	30%	15	21.9	M	3%	0.000150	3.4
			Chiller Temperature Reset	4.6%	50%	1%	1	43.8	M	3%	0.000150	1.5

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Transport	Retrofit	Process Heating	Improved Sensors And Process Controls	9.8%	70%	8%	10	93.4	M	3%	0.000150	1.5
			Water Heater Cycling	0.1%	50%	15%	10	1.2	M	3%	0.000150	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.2%	35%	2%	15	1.9	O	4%	0.000150	0.8
			Load Management (Process Changes)	9.8%	25%	2%	10	93.4	M	3%	0.000150	4.9
			Timers (Process Heating)	9.8%	70%	3%	10	93.4	M	3%	0.000150	9.2
			Heat Containment Improvements	2.5%	70%	5%	10	23.4	M	3%	0.000150	10.4
			Heat Transfer Improvements	2.5%	70%	5%	10	23.4	M	3%	0.000150	1.5
			Heat Recovery Improvements	9.8%	70%	5%	10	93.4	M	3%	0.000150	1.5
		Other	Advanced Lubricants	0.7%	5%	2%	1	6.8	M	3%	0.000150	4.9
			Electric Supply System Improvements	3.1%	10%	3%	5	29.6	M	3%	0.000150	5.5
	ROB	Air Compression	Variable Displacement Compressor	2.0%	30%	10%	15	1.4	L	6%	0.000150	0.8
		HVAC	Destratification Fans	2.0%	20%	20%	10	2.1	M	18%	0.000150	0.9
			HE Heat Pumps, Including Geothermal	3.1%	33%	8%	15	2.3	L	6%	0.000150	0.7
			HE HVAC System Design	15.7%	10%	8%	15	11.5	L	6%	0.000150	1.1
			Industrial Air Curtains	3.1%	80%	2%	5	6.3	M	18%	0.000150	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8.3%	10%	12%	15	6.1	L	6%	0.000150	5.3
			Heat Reclaim Absorption Chillers	0.5%	1%	90%	15	0.4	L	6%	0.000150	7.2
			HE Packaged AC	2.1%	20%	25%	10	2.2	M	18%	0.000150	5.7
			HE Rooftop Ac Systems	2.1%	10%	25%	10	2.2	M	18%	0.000150	5.7
		Motors	Motor - Nema Premium Efficiency	8.8%	50%	2%	25	4.2	O	1%	0.000150	2.0
				13.3%	50%	2%	25	6.3	O	1%	0.000150	2.0
				22.1%	50%	2%	25	10.5	O	1%	0.000150	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	4.4%	10%	67%	15	32.3	L	6%	0.000150	0.8
		Process Cooling	Energy Efficient Equipment	4.6%	50%	1%	20	2.6	M	18%	0.000150	0.5
			HE Compressors	2.3%	50%	8%	15	1.7	L	6%	0.000150	2.9
			HE Condensers	2.3%	50%	2%	15	1.7	L	6%	0.000150	2.9
			Cooling Tower Free Cooling	4.6%	50%	1%	10	4.8	M	18%	0.000150	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.2%	5%	2%	8	0.2	M	18%	0.000150	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.2%	5%	2%	15	0.1	M	18%	0.000150	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.5%	50%	2%	5	1.0	M	18%	0.000150	4.2
		Other	Motor - Nema Premium Efficiency	3.1%	50%	1%	25	1.5	O	1%	0.000150	2.0
			Transformers (Nema Tier Ii)	0.6%	5%	3%	30	0.3	M	18%	0.000150	0.2
Wood Products	NC	HVAC	Air Sealing	5.8%	5%	17%	15	0.6	L	6%	0.000154	1.2
			HE (ES) Building Design	7.2%	2%	30%	15	0.8	L	6%	0.000154	1.0
			HE (ES) Windows And Skylights	3.6%	5%	19%	15	0.4	L	6%	0.000154	0.2
			HVAC System Commissioning	7.2%	0%	10%	5	0.8	L	6%	0.000154	0.1
			Improved Below-Grade Insulation	3.6%	5%	10%	15	0.4	L	6%	0.000154	0.3
			Improved Roof/Ceiling Insulation	3.6%	5%	26%	15	0.4	L	6%	0.000154	0.9
			Improved Wall Insulation	3.6%	5%	26%	15	0.4	L	6%	0.000154	0.4
			Cool Roofs And Exterior Walls	7.2%	2%	12%	15	0.8	L	6%	0.000154	0.1

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Wood Products	NC	HVAC - Cooling	HE Chillers, Air And Water Cooled	2.9%	10%	12%	15	0.3	M	18%	0.000154	5.3
		Lighting	Replace T12 with HP T8/T5	4.2%	54%	49%	15	0.4	O	3%	0.000154	2.2
			Replace High Bay HID with T8 (70% conv)	1.4%	50%	22%	15	0.2	H	36%	0.000154	20.0
			Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	0.2	H	36%	0.000154	3.2
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	0.0	H	36%	0.000154	20.0
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000154	3.2
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000154	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000154	2.9
			Efficient Lighting Design/Layout	6.1%	80%	37%	11	0.6	H	36%	0.000154	1.9
			Interior Lighting Timers/Elapsed Time Switching	5.0%	75%	40%	25	0.5	H	36%	0.000154	3.0
			Exterior Light Timers	1.4%	85%	30%	15	0.2	M	18%	0.000154	14.4
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	0.0%	60%	10%	15	0.0	O	2%	0.000154	0.3
			VSD For Air Compressor Motors	0.0%	30%	10%	15	0.0	M	3%	0.000154	3.4
			Blower Purge Dryer	0.0%	20%	50%	15	0.0	L	1%	0.000154	9.6
			Regulated Compressed Air Nozzles	0.0%	50%	2%	15	0.0	L	1%	0.000154	11.5
			Compressed Air Storage Tank	0.0%	50%	2%	15	0.0	L	1%	0.000154	11.5
			Compressed Air System Design/Control	0.0%	80%	20%	15	0.0	L	1%	0.000154	3.2
			Process - Swap CA Tools For Electric Ones	0.0%	70%	50%	10	0.0	L	1%	0.000154	12.9
			Advanced Lubricants	0.0%	5%	3%	1	0.0	L	1%	0.000154	5.0
			Cooler Ambient Temperature (-11 Of)	0.0%	5%	1%	20	0.0	L	1%	0.000154	10.4
			Cycling Air Dryer	0.0%	25%	50%	10	0.0	L	1%	0.000154	3.4
			Duct In Outside Air To Compressor	0.0%	10%	2%	20	0.0	L	1%	0.000154	10.4
			Oil Temperature Control	0.0%	33%	2%	10	0.0	M	3%	0.000154	1.4
			Compressed Air System Isolation	0.0%	20%	2%	15	0.0	O	3%	0.000154	1.3
			Compressed Air System Leak Repair	0.0%	50%	10%	2	0.0	O	3%	0.000154	4.3
			Eliminating Wasteful Uses	0.0%	50%	1%	5	0.0	O	3%	0.000154	4.0
			Reduce Operating Pressure Of Compressed Air System	0.0%	50%	3%	20	0.0	O	3%	0.000154	13.0
			Regular Maintenance	0.0%	50%	5%	1	0.0	O	3%	0.000154	0.5
			Vacuum Leak Repair	0.0%	5%	2%	2	0.0	O	3%	0.000154	4.3
			Vacuum System Isolation	0.0%	5%	2%	5	0.0	O	3%	0.000154	4.0
			Air Compressor System Management	0.0%	25%	20%	2	0.0	O	3%	0.000154	0.4
			Advanced Air Compression Controls	0.0%	30%	4%	15	0.0	O	3%	0.000154	1.3
			Electric Supply System Improvements	0.0%	10%	3%	5	0.0	M	3%	0.000154	5.6
			Night Shut Off For Compressor	0.0%	50%	10%	10	0.0	M	3%	0.000154	16.1
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	7.2%	50%	15%	2	76.4	M	3%	0.000154	6.0
			Energy Management System	7.2%	10%	10%	5	76.4	M	3%	0.000154	10.9
			HE (ES) Windows And Skylights	3.6%	5%	19%	15	38.2	L	1%	0.000154	0.2
			HVAC System By-Pass Timer	7.2%	50%	5%	5	76.4	L	1%	0.000154	3.8
			HVAC System Tune-Up/Maintenance	7.2%	20%	10%	5	76.4	L	1%	0.000154	0.1
			Improve Duct Sealing	7.2%	15%	7%	10	76.4	M	3%	0.000154	5.8

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Wood Products	Retrofit	HVAC	Improved Below-Grade Insulation	3.6%	5%	10%	15	38.2	L	1%	0.000154	0.3
			Improved Roof/Ceiling Insulation	3.6%	5%	26%	15	38.2	L	1%	0.000154	0.9
			Improved Wall Insulation	3.6%	5%	26%	15	38.2	L	1%	0.000154	0.4
			Insulate Pipes/Lines	7.2%	80%	3%	5	76.4	M	3%	0.000154	6.6
			Thermostat Calibration	7.2%	10%	5%	5	76.4	L	1%	0.000154	14.1
			Ventilation Controls Installed	5.8%	5%	15%	5	61.1	L	1%	0.000154	28.8
			Cool Roofs And Exterior Walls	7.2%	2%	12%	15	76.4	L	1%	0.000154	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1.2%	50%	20%	10	12.2	M	3%	0.000154	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.7%	40%	30%	10	7.6	O	4%	0.000154	0.9
			HVAC System Retrocommissioning*	7.2%	0%	10%	5	76.4	L	1%	0.000154	0.1
			Programmable Thermostat	7.2%	50%	4%	5	76.4	L	1%	0.000154	14.1
			Time Clock	7.2%	10%	4%	5	76.4	L	1%	0.000154	14.1
		HVAC - Cooling	Electric Supply System Improvements	2.9%	10%	3%	5	30.4	L	1%	0.000154	5.5
			Chilled Water Free Cooling Controls And Equipments	1.1%	50%	30%	15	11.4	M	3%	0.000154	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	2.9%	25%	5%	15	30.4	M	3%	0.000154	0.3
			Chiller Optimization Controls	2.9%	25%	5%	15	30.4	M	3%	0.000154	1.7
			Chiller, Early Retirement	2.9%	5%	5%	15	30.4	L	1%	0.000154	0.3
			Motor System Optimization (Incl. Resizing and Asd)	2.7%	5%	6%	10	28.5	M	3%	0.000154	0.9
			Economizer (Hydronic Or Outside Air)	0.7%	2%	20%	10	7.6	M	3%	0.000154	3.4
			Ultraviolet A/C Coil Cleaning System	0.7%	25%	4%	2	7.6	L	1%	0.000154	0.3
			Cooling Tower Optimization	0.4%	25%	5%	5	3.8	M	3%	0.000154	0.4
		Lighting	Replace T12 with HP T8/T5	4.2%	54%	46%	15	44.7	O	3%	0.000154	0.9
			Replace High Bay HID with T8 (70% conv)	1.4%	50%	22%	15	21.7	M	3%	0.000154	6.2
			Replace High Bay HID with PSMH (30% conv)	0.6%	59%	10%	15	21.7	O	0%	0.000154	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.1%	59%	22%	15	1.2	O	3%	0.000154	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	1.2	O	0%	0.000154	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	1.2	L	1%	0.000154	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	1.2	O	1%	0.000154	0.6
			Efficient Lighting Design/Layout	6.1%	80%	37%	11	64.0	M	3%	0.000154	1.9
			Interior Lighting Timers/Elapsed Time Switching	5.0%	75%	40%	25	52.7	M	3%	0.000154	3.0
			Exterior Light Timers	1.4%	85%	30%	15	15.1	M	3%	0.000154	14.4
		Motors	Improved Sensors And Process Controls	21.6%	40%	3%	10	227.8	M	3%	0.000154	1.5
			Fan System Efficiency Improvements	12.9%	10%	6%	10	136.7	M	3%	0.000154	5.0
			Pump System Efficiency Improvements	23.0%	10%	16%	10	243.0	M	3%	0.000154	5.0
			Trim Existing Pump Impeller To More Closely Match Syster	11.5%	25%	2%	5	121.5	O	3%	0.000154	1.2
			Motor Early Retirement	14.4%	60%	5%	10	151.9	M	3%	0.000154	5.0
			Advanced Lubricants and Drivetrain Maintenance	16.5%	5%	3%	1	174.6	M	3%	0.000154	13.4
			Motor Optimization / Variable Speed Drives (Process Fans	20.8%	60%	30%	15	220.2	O	3%	0.000154	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	7.2%	25%	2%	10	759.3	M	3%	0.000154	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	18.0%	40%	3%	2	759.3	M	3%	0.000154	4.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Wood Products	Retrofit	Motors	Improved Process Scheduling and Deenergizing Idle Mach	71.9%	25%	3%	5	759.3	L	1%	0.000154	10.3
			Process Rework and Scrap Reduction	71.9%	25%	3%	5	759.3	L	1%	0.000154	10.3
		Process Cooling	Improved Sensors And Process Controls	0.2%	40%	3%	10	1.9	M	3%	0.000154	2.1
			Advanced Lubricants	0.1%	5%	3%	1	0.7	H	4%	0.000154	5.0
			Electric Supply System Improvements	0.6%	10%	3%	5	6.5	M	3%	0.000154	5.6
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000154	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0.2%	50%	5%	10	1.9	M	3%	0.000154	0.6
			Condensate Evaporator	0.2%	10%	5%	10	2.4	M	3%	0.000154	1.9
			Defrost Control System	0.3%	25%	3%	10	3.2	M	3%	0.000154	4.8
			Desuperheaters	0.2%	10%	5%	10	1.6	M	3%	0.000154	8.8
			Economizer For Walk-In Coolers	0.0%	10%	10%	10	0.3	M	3%	0.000154	1.5
			Evaporate Pre-Cooler	0.2%	10%	5%	10	1.6	M	3%	0.000154	0.3
			Evaporator Fan Controller	0.2%	10%	1%	10	1.6	M	3%	0.000154	4.8
			Floating Head Pressure Control	0.3%	50%	5%	10	3.2	M	3%	0.000154	3.2
			Insulated Suction Lines	0.3%	50%	1%	5	3.2	H	4%	0.000154	1.2
			Liquid Pressure Amplifiers	0.3%	10%	5%	5	3.2	M	3%	0.000154	2.4
			Refrigeration System Maintenance	0.6%	25%	5%	3	6.5	M	3%	0.000154	8.1
			Repair Refrigerator/Freezer Leaks	0.6%	50%	10%	3	6.5	M	3%	0.000154	8.1
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.1%	0%	7%	15	0.6	M	3%	0.000154	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.1%	0%	4%	15	0.6	M	3%	0.000154	3.4
			VSD On Refrigeration Circulating Pump	0.3%	30%	30%	15	3.2	M	3%	0.000154	3.4
			VSD On Refrigeration Fan	0.3%	30%	30%	15	3.2	M	3%	0.000154	3.4
			Chiller Temperature Reset	0.6%	50%	1%	1	6.5	M	3%	0.000154	1.5
		Process Heating	Improved Sensors And Process Controls	5.2%	70%	8%	10	54.8	M	3%	0.000154	1.5
			Water Heater Cycling	0.3%	50%	15%	10	3.4	M	3%	0.000154	14.6
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.5%	35%	2%	15	5.5	O	4%	0.000154	0.8
			Load Management (Process Changes)	5.2%	25%	2%	10	54.8	M	3%	0.000154	5.0
			Timers (Process Heating)	5.2%	70%	3%	10	54.8	M	3%	0.000154	9.2
			Heat Containment Improvements	1.3%	70%	5%	10	13.7	M	3%	0.000154	10.4
			Heat Transfer Improvements	1.3%	70%	5%	10	13.7	M	3%	0.000154	1.5
			Heat Recovery Improvements	5.2%	70%	5%	10	54.8	M	3%	0.000154	1.5
		Other	Advanced Lubricants	1.8%	5%	2%	1	19.3	M	3%	0.000154	4.9
			Electric Supply System Improvements	7.9%	10%	3%	5	83.9	M	3%	0.000154	5.5
	ROB	Air Compressior	Variable Displacement Compressor	0.0%	30%	10%	15	0.0	L	6%	0.000154	0.8
		HVAC	Destratification Fans	0.7%	20%	20%	10	0.8	M	18%	0.000154	0.9
			HE Heat Pumps, Including Geothermal	1.2%	33%	8%	15	0.9	L	6%	0.000154	0.7
			HE HVAC System Design	5.8%	10%	8%	15	4.7	L	6%	0.000154	1.1
			Industrial Air Curtains	1.2%	80%	2%	5	2.6	M	18%	0.000154	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2.9%	10%	12%	15	2.3	L	6%	0.000154	5.3
			Heat Reclaim Absorption Chillers	0.2%	1%	90%	15	0.1	L	6%	0.000154	7.2

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Wood Products	ROB	HVAC - Cooling	HE Packaged AC	0.7%	20%	25%	10	0.8	M	18%	0.000154	5.7
			HE Rooftop Ac Systems	0.7%	10%	25%	10	0.8	M	18%	0.000154	5.7
		Motors	Motor - Nema Premium Efficiency	14.4%	50%	2%	25	7.6	O	1%	0.000154	2.0
				21.6%	50%	2%	25	11.4	O	1%	0.000154	2.0
				35.9%	50%	2%	25	19.0	O	1%	0.000154	2.0
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	7.2%	10%	67%	15	58.2	L	6%	0.000154	0.8
		Process Cooling	Energy Efficient Equipment	0.6%	50%	1%	20	0.4	M	18%	0.000154	0.5
			HE Compressors	0.3%	50%	8%	15	0.2	L	6%	0.000154	2.9
			HE Condensers	0.3%	50%	2%	15	0.2	L	6%	0.000154	2.9
			Cooling Tower Free Cooling	0.6%	50%	1%	10	0.7	M	18%	0.000154	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.1%	5%	2%	8	0.2	M	18%	0.000154	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.1%	5%	2%	15	0.1	M	18%	0.000154	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.5%	50%	2%	5	1.2	M	18%	0.000154	4.2
		Other	Motor - Nema Premium Efficiency	7.9%	50%	1%	25	4.2	O	1%	0.000154	2.0
			Transformers (Nema Tier Ii)	1.6%	5%	3%	30	0.7	M	18%	0.000154	0.2
WWTF	NC	HVAC	Air Sealing	0.0%	5%	17%	15	0.0	L	6%	0.000157	1.2
			HE (ES) Building Design	0.0%	2%	30%	15	0.0	L	6%	0.000157	1.0
			HE (ES) Windows And Skylights	0.0%	5%	19%	15	0.0	L	6%	0.000157	0.2
			HVAC System Commissioning	0.0%	0%	10%	5	0.0	L	6%	0.000157	0.1
			Improved Below-Grade Insulation	0.0%	5%	10%	15	0.0	L	6%	0.000157	0.3
			Improved Roof/Ceiling Insulation	0.0%	5%	26%	15	0.0	L	6%	0.000157	0.9
			Improved Wall Insulation	0.0%	5%	26%	15	0.0	L	6%	0.000157	0.4
			Cool Roofs And Exterior Walls	0.0%	2%	12%	15	0.0	L	6%	0.000157	0.1
		HVAC - Cooling	HE Chillers, Air And Water Cooled	0.0%	10%	12%	15	0.0	M	18%	0.000157	5.3
		Lighting	Replace T12 with HP T8/T5	2.3%	54%	49%	15	0.1	O	3%	0.000157	2.2
			Replace High Bay HID with T8 (70% conv)	0.8%	50%	22%	15	0.1	H	36%	0.000157	20.0
			Replace High Bay HID with PSMH (30% conv)	0.4%	59%	10%	15	0.1	H	36%	0.000157	3.2
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	0.0	H	36%	0.000157	20.0
			Replace Inefficient Non High Bay HID with PSMH	0.0%	59%	10%	15	0.0	H	36%	0.000157	3.2
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.0	L	6%	0.000157	2.7
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.0	O	1%	0.000157	2.9
			Efficient Lighting Design/Layout	3.4%	80%	37%	11	0.2	H	36%	0.000157	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.8%	75%	40%	25	0.1	H	36%	0.000157	3.1
			Exterior Light Timers	0.8%	85%	30%	15	0.0	M	18%	0.000157	14.4
	Retrofit	Air Compression	High Efficiency Air Compress (Upgrade)	37.5%	60%	10%	15	183.3	O	2%	0.000157	0.3
			VSD For Air Compressor Motors	18.8%	30%	10%	15	183.3	M	3%	0.000157	3.4
			Blower Purge Dryer	7.5%	20%	50%	15	36.7	L	1%	0.000157	9.6
			Regulated Compressed Air Nozzles	41.7%	50%	2%	15	203.6	L	1%	0.000157	11.6
			Compressed Air Storage Tank	49.0%	50%	2%	15	239.5	L	1%	0.000157	11.6
			Compressed Air System Design/Control	49.0%	80%	20%	15	239.5	L	1%	0.000157	3.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
WWTF	Retrofit	Air Compression	Process - Swap CA Tools For Electric Ones	49.0%	70%	50%	10	239.5	L	1%	0.000157	12.9
			Advanced Lubricants	8.6%	5%	3%	1	42.2	L	1%	0.000157	5.0
			Cooler Ambient Temperature (-11 Of)	49.0%	5%	1%	20	239.5	L	1%	0.000157	10.4
			Cycling Air Dryer	12.5%	25%	50%	10	61.1	L	1%	0.000157	3.4
			Duct In Outside Air To Compressor	37.5%	10%	2%	20	183.3	L	1%	0.000157	10.4
			Oil Temperature Control	18.8%	33%	2%	10	91.7	M	3%	0.000157	1.4
			Compressed Air System Isolation	49.0%	20%	2%	15	239.5	O	3%	0.000157	1.3
			Compressed Air System Leak Repair	49.0%	50%	10%	2	239.5	O	3%	0.000157	4.3
			Eliminating Wasteful Uses	49.0%	50%	1%	5	239.5	O	3%	0.000157	4.0
			Reduce Operating Pressure Of Compressed Air System	49.0%	50%	3%	20	239.5	O	3%	0.000157	13.0
			Regular Maintenance	49.0%	50%	5%	1	239.5	O	3%	0.000157	0.5
			Vacuum Leak Repair	0.2%	5%	2%	2	1.0	O	3%	0.000157	4.3
			Vacuum System Isolation	0.2%	5%	2%	5	1.0	O	3%	0.000157	4.0
			Air Compressor System Management	49.0%	25%	20%	2	239.5	O	3%	0.000157	0.4
			Advanced Air Compression Controls	41.7%	30%	4%	15	203.6	O	3%	0.000157	1.3
			Electric Supply System Improvements	49.0%	10%	3%	5	239.5	M	3%	0.000157	5.6
			Night Shut Off For Compressor	39.2%	50%	10%	10	191.6	M	3%	0.000157	16.1
		HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	0.0%	50%	15%	2	0.0	M	3%	0.000157	6.0
			HE (ES) Windows And Skylights	0.0%	5%	19%	15	0.0	L	1%	0.000157	0.2
			HVAC System By-Pass Timer	0.0%	50%	5%	5	0.0	L	1%	0.000157	3.8
			HVAC System Tune-Up/Maintenance	0.0%	20%	10%	5	0.0	L	1%	0.000157	0.1
			Improve Duct Sealing	0.0%	15%	7%	10	0.0	M	3%	0.000157	5.9
			Improved Below-Grade Insulation	0.0%	5%	10%	15	0.0	L	1%	0.000157	0.3
			Improved Roof/Ceiling Insulation	0.0%	5%	26%	15	0.0	L	1%	0.000157	0.9
			Improved Wall Insulation	0.0%	5%	26%	15	0.0	L	1%	0.000157	0.4
			Insulate Pipes/Lines	0.0%	80%	3%	5	0.0	M	3%	0.000157	6.6
			Thermostat Calibration	0.0%	10%	5%	5	0.0	L	1%	0.000157	14.2
			Ventilation Controls Installed	0.0%	5%	15%	5	0.0	L	1%	0.000157	28.9
			Cool Roofs And Exterior Walls	0.0%	2%	12%	15	0.0	L	1%	0.000157	0.1
			Controls Of Paint Or Spray Booth Exhaust/Supply System	0.0%	50%	20%	10	0.0	M	3%	0.000157	2.8
			VSD On the Pump Or Fan Motor Of A HVAC System	0.0%	40%	30%	10	0.0	O	4%	0.000157	0.9
			HVAC System Retrocommissioning*	0.0%	0%	10%	5	0.0	L	1%	0.000157	0.1
			Programmable Thermostat	0.0%	50%	4%	5	0.0	L	1%	0.000157	14.2
			Time Clock	0.0%	10%	4%	5	0.0	L	1%	0.000157	14.2
		HVAC - Cooling	Energy Management System	0.0%	10%	10%	5	0.0	M	3%	0.000157	10.9
			Electric Supply System Improvements	0.0%	10%	3%	5	0.0	L	1%	0.000157	5.6
			Chilled Water Free Cooling Controls And Equipments	0.0%	50%	30%	15	0.0	M	3%	0.000157	11.7
			Chilled Water Reset, Optimizer For Chiller(S)	0.0%	25%	5%	15	0.0	M	3%	0.000157	0.3
			Chiller Optimization Controls	0.0%	25%	5%	15	0.0	M	3%	0.000157	1.7
			Chiller, Early Retirement	0.0%	5%	5%	15	0.0	L	1%	0.000157	0.3

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
WWTF	Retrofit	HVAC - Cooling	Motor System Optimization (Incl. Resizing and Asd)	0.0%	5%	6%	10	0.0	M	3%	0.000157	0.9
			Economizer (Hydronic Or Outside Air)	0.0%	2%	20%	10	0.0	M	3%	0.000157	3.4
			Ultraviolet A/C Coil Cleaning System	0.0%	25%	4%	2	0.0	L	1%	0.000157	0.3
			Cooling Tower Optimization	0.0%	25%	5%	5	0.0	M	3%	0.000157	0.4
		Lighting	Replace T12 with HP T8/T5	2.3%	54%	46%	15	11.3	O	3%	0.000157	0.9
			Replace High Bay HID with T8 (70% conv)	0.8%	50%	22%	15	5.8	M	3%	0.000157	6.2
			Replace High Bay HID with PSMH (30% conv)	0.4%	59%	10%	15	5.8	O	0%	0.000157	0.8
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0.0%	59%	22%	15	0.3	O	3%	0.000157	6.2
			Replace Inefficient Non-High Bay HID with PSMH	0.0%	59%	10%	15	0.3	O	0%	0.000157	0.8
			Replace Exterior HID with Induction Lighting	0.1%	2%	43%	15	0.3	L	1%	0.000157	1.3
			Replace Exterior HID with LED Lighting	0.1%	2%	60%	15	0.3	O	1%	0.000157	0.6
			Efficient Lighting Design/Layout	3.4%	80%	37%	11	16.6	M	3%	0.000157	1.9
			Interior Lighting Timers/Elapsed Time Switching	2.8%	75%	40%	25	13.7	M	3%	0.000157	3.1
			Exterior Light Timers	0.8%	85%	30%	15	3.9	M	3%	0.000157	14.4
		Motors	Improved Sensors And Process Controls	12.0%	40%	3%	10	58.7	M	3%	0.000157	1.5
			Fan System Efficiency Improvements	8.0%	10%	6%	10	39.1	M	3%	0.000157	5.0
			Pump System Efficiency Improvements	24.0%	10%	16%	10	117.3	M	3%	0.000157	5.0
			Trim Existing Pump Impeller To More Closely Match Syster	12.0%	25%	2%	5	58.7	O	3%	0.000157	1.2
			Motor Early Retirement	8.0%	60%	5%	10	39.1	M	3%	0.000157	5.0
			Advanced Lubricants and Drivetrain Maintenance	9.2%	5%	3%	1	45.0	M	3%	0.000157	13.4
			Motor Optimization / Variable Speed Drives (Process Fans,	11.6%	60%	30%	15	56.7	O	3%	0.000157	4.1
			Low-Load and Soft Start Technologies (Nola Controllers)	4.0%	25%	2%	10	195.5	M	3%	0.000157	4.0
			Use of Energy Efficient Belts and Other Improved Mechanis	10.0%	40%	3%	2	195.5	M	3%	0.000157	4.2
			Improved Process Scheduling and Deenergizing Idle Mach	40.0%	25%	3%	5	195.5	L	1%	0.000157	10.3
			Process Rework and Scrap Reduction	40.0%	25%	3%	5	195.5	L	1%	0.000157	10.3
		Process Cooling	Improved Sensors And Process Controls	0.0%	40%	3%	10	0.0	M	3%	0.000157	2.1
			Advanced Lubricants	0.0%	5%	3%	1	0.0	H	4%	0.000157	5.0
			Electric Supply System Improvements	0.0%	10%	3%	5	0.0	M	3%	0.000157	5.6
			Air Curtain Technologies	0.0%	50%	30%	20	0.0	M	3%	0.000157	2.9
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0.0%	50%	5%	10	0.0	M	3%	0.000157	0.6
			Condensate Evaporator	0.0%	10%	5%	10	0.0	M	3%	0.000157	1.9
			Defrost Control System	0.0%	25%	3%	10	0.0	M	3%	0.000157	4.8
			Desuperheaters	0.0%	10%	5%	10	0.0	M	3%	0.000157	8.8
			Economizer For Walk-In Coolers	0.0%	10%	10%	10	0.0	M	3%	0.000157	1.5
			Evaporate Pre-Cooler	0.0%	10%	5%	10	0.0	M	3%	0.000157	0.3
			Evaporator Fan Controller	0.0%	10%	1%	10	0.0	M	3%	0.000157	4.8
			Floating Head Pressure Control	0.0%	50%	5%	10	0.0	M	3%	0.000157	3.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (Yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
WWTF	Retrofit	Process Cooling	Insulated Suction Lines	0.0%	50%	1%	5	0.0	H	4%	0.000157	1.2
			Liquid Pressure Amplifiers	0.0%	10%	5%	5	0.0	M	3%	0.000157	2.4
			Refrigeration System Maintenance	0.0%	25%	5%	3	0.0	M	3%	0.000157	8.2
			Repair Refrigerator/Freezer Leaks	0.0%	50%	10%	3	0.0	M	3%	0.000157	8.2
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0.0%	0%	7%	15	0.0	M	3%	0.000157	5.7
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0.0%	0%	4%	15	0.0	M	3%	0.000157	3.4
			VSD On Refrigeration Circulating Pump	0.0%	30%	30%	15	0.0	M	3%	0.000157	3.4
			VSD On Refrigeration Fan	0.0%	30%	30%	15	0.0	M	3%	0.000157	3.4
			Chiller Temperature Reset	0.0%	50%	1%	1	0.0	M	3%	0.000157	1.5
		Process Heating	Improved Sensors And Process Controls	0.0%	70%	8%	10	0.0	M	3%	0.000157	1.5
			Water Heater Cycling	0.0%	50%	15%	10	0.0	M	3%	0.000157	14.7
			Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0.0%	35%	2%	15	0.0	O	4%	0.000157	0.8
			Load Management (Process Changes)	0.0%	25%	2%	10	0.0	M	3%	0.000157	5.0
			Timers (Process Heating)	0.0%	70%	3%	10	0.0	M	3%	0.000157	9.2
			Heat Containment Improvements	0.0%	70%	5%	10	0.0	M	3%	0.000157	10.4
			Heat Transfer Improvements	0.0%	70%	5%	10	0.0	M	3%	0.000157	1.5
			Heat Recovery Improvements	0.0%	70%	5%	10	0.0	M	3%	0.000157	1.5
		Other	Advanced Lubricants	1.4%	5%	2%	1	6.7	M	3%	0.000157	4.9
			Electric Supply System Improvements	6.0%	10%	3%	5	29.3	M	3%	0.000157	5.5
	ROB	Air Compression	Variable Displacement Compressor	28.1%	30%	10%	15	10.5	L	6%	0.000157	0.8
		HVAC	Destratification Fans	0.0%	20%	20%	10	0.0	M	18%	0.000157	0.9
			HE Heat Pumps, Including Geothermal	0.0%	33%	8%	15	0.0	L	6%	0.000157	0.7
			HE HVAC System Design	0.0%	10%	8%	15	0.0	L	6%	0.000157	1.1
			Industrial Air Curtains	0.0%	80%	2%	5	0.0	M	18%	0.000157	0.6
		HVAC - Cooling	HE Chillers, Air And Water Cooled	0.0%	10%	12%	15	0.0	L	6%	0.000157	5.3
			Heat Reclaim Absorption Chillers	0.0%	1%	90%	15	0.0	L	6%	0.000157	7.2
			HE Packaged AC	0.0%	20%	25%	10	0.0	M	18%	0.000157	5.7
			HE Rooftop Ac Systems	0.0%	10%	25%	10	0.0	M	18%	0.000157	5.7
		Motors	Motor - Nema Premium Efficiency	8.0%	50%	2%	25	2.0	O	1%	0.000157	2.0
				12.0%	50%	2%	25	2.9	O	1%	0.000157	2.0
				20.0%	50%	2%	25	4.9	O	1%	0.000157	2.0
		Process Cooling	Energy Efficient Equipment	0.0%	50%	1%	20	0.0	M	18%	0.000157	0.5
			HE Compressors	0.0%	50%	8%	15	0.0	L	6%	0.000157	2.9
			HE Condensers	0.0%	50%	2%	15	0.0	L	6%	0.000157	2.9
			Cooling Tower Free Cooling	0.0%	50%	1%	10	0.0	M	18%	0.000157	1.2
		Process Heating	Electric Drying - Replacement with more Efficient Technolo	0.0%	5%	2%	8	0.0	M	18%	0.000157	0.5
			Electric Curing - Replacement with more Efficient Technolo	0.0%	5%	2%	15	0.0	M	18%	0.000157	0.6
			Emmissions RTO - Reduce Head Loss Through Media	0.0%	50%	2%	5	0.0	M	18%	0.000157	4.3
		Other	Motor - Nema Premium Efficiency	6.0%	50%	1%	25	1.5	O	1%	0.000157	2.0
			Transformers (Nema Tier Ii)	1.2%	5%	3%	30	0.3	M	18%	0.000157	0.2

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Beverage and Tobacco	NC	HVAC - Heating	HE (ES) Building Design	8.88%	2%	1%	15	1	L	1%	0.32
			HE (ES) Windows and Skylights	4.44%	5%	1%	15	0	L	1%	0.11
			HE HVAC System Design	8.88%	10%	30%	15	1	M	5%	1.90
			HVAC System Commissioning	0.89%	0%	10%	5	0	L	1%	1.32
			Radiant floor heating	0.89%	50%	12%	30	0	M	5%	16.24
	Retrofit	HVAC - Heating	Improved Below-Grade Insulation	4.44%	5%	1%	15	37	L	1%	0.32
			Improved Roof/Ceiling Insulation	4.44%	5%	1%	15	37	L	1%	0.32
			Improved Wall Insulation	4.44%	1%	1%	15	37	L	1%	0.16
			Destratification Fans	0.89%	10%	10%	15	15	M	5%	34.56
			Improve Duct Sealing	8.88%	15%	7%	10	75	M	5%	5.79
			Insulate Pipes/Lines	8.88%	80%	1%	10	75	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.89%	50%	1%	5	7	M	5%	67.94
			Energy Management System	0.89%	10%	10%	10	7	M	5%	1.18
			HVAC System By-pass Timer	0.89%	10%	1%	10	7	L	1%	48.62
			Thermostat Calibration	0.89%	10%	2%	5	7	M	5%	92.00
			Ventilation Controls Installed	2.84%	5%	15%	15	24	M	5%	1.32
			Boiler - Automatic Chemical feed	0.71%	70%	1%	15	6	M	5%	70.58
			Boiler - Flue gas heat recovery	0.89%	70%	2%	15	7	M	5%	12.83
			Boiler - Install Damper Controls	0.71%	70%	5%	15	6	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.71%	65%	8%	15	6	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.71%	20%	15%	15	6	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.71%	40%	25%	15	6	M	5%	6.85
			Boiler O2 Trim Controls	0.71%	30%	2%	10	6	O	6%	10.10
			Heat Recovery for Space Heating	0.40%	0%	1%	20	67	M	5%	9.49
			Gas IR Radiant Heating	1.33%	10%	19%	15	11	M	5%	0.49
			Micro Channel Heat Exchangers	3.02%	5%	5%	15	25	M	5%	4.44
			Exhaust Hood Makeup Air	3.37%	15%	5%	15	28	M	5%	1.33
			Solar ventilation pre-heat	0.36%	50%	15%	15	3	L	1%	3.48
			Increase Use of Zoning	8.88%	20%	15%	20	75	M	5%	0.29
			Boiler Controls / Cx and RCx	0.89%	20%	15%	15	7	M	5%	26.14
			Boiler Tune-Up	0.89%	25%	2%	2	7	M	5%	28.74
			HVAC System Retrocommissioning	0.89%	0%	10%	5	7	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.89%	20%	10%	5	7	M	5%	26.76
			Programmable Thermostat (incl minimum set-po	0.89%	50%	4%	10	7	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	53.27%	70%	1%	10	448	M	5%	78.76
			Boiler - Install Damper Controls	53.27%	20%	5%	15	448	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	5.19%	20%	1%	15	560	M	5%	2.79
			Boiler Tune-Up	66.59%	25%	6%	2	560	M	5%	15.47
			Heat Trap	13.32%	80%	5%	5	112	M	5%	62.51

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Beverage and Tobacco	Retrofit	Steam Production	Insulate piping, valves, fittings, vessels	26.64%	37%	1%	10	560	M	5%	5.79
			Improved Condensate Recovery	16.12%	50%	2%	10	560	H	8%	3.58
			Steam leak repair	10.46%	50%	1%	2	560	M	5%	63.22
			Steam Trap Maintenance	66.59%	35%	3%	2	560	O	6%	18.59
			Blowdown Heat Recovery	7.99%	70%	1%	15	560	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	2.26%	70%	2%	15	560	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	19.98%	30%	2%	10	560	O	6%	10.10
			Burner Upgrades, Repair and Replacement	6.66%	5%	2%	10	560	M	5%	3.27
			Heat Recovery for Hot Water Use	19.98%	50%	30%	15	168	M	5%	12.83
			Solar Water Heater	0.67%	5%	60%	15	560	L	1%	0.15
			Install Feedwater Economizers	8.66%	5%	2%	15	560	M	5%	6.21
			Improve Water Treatment	50.61%	5%	1%	15	560	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	4.26%	5%	1%	2	560	M	5%	14.28
			Improve Blowdown Practices	9.32%	5%	1%	15	560	M	5%	16.41
			Add/Restore Boiler Refractory	2.46%	5%	1%	15	560	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	5.73%	5%	1%	15	560	M	5%	42.01
			Reduce Steam System Generating Pressure	5.93%	5%	1%	15	560	M	5%	71.29
			Other Steam System Improvements and Contro	9.99%	5%	3%	15	560	M	5%	10.46
		Process Heating (C	Improved Sensors and Process Controls	15.54%	70%	8%	8	131	M	5%	10.84
			Water Heater Cycling	7.77%	50%	5%	10	65	M	5%	18.32
			Condensing Heat Exchanger	0.00%	5%	8%	10	0	M	5%	5.92
			Improved Gas Drying and Heating Technologies	0.00%	10%	13%	15	0	L	1%	2.67
			Burner Upgrades	0.00%	5%	4%	10	0	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	0.00%	70%	50%	15	0	L	1%	3.97
			Insulating Blankets	0.00%	80%	1%	10	0	M	5%	17.50
			Install Automatic Stack Dampers	0.00%	20%	5%	15	0	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.05)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	15.54%	25%	4%	10	131	M	5%	17.90
			Reduced Temperature Setpoints	15.54%	70%	19%	1	131	L	1%	22.59
			Timers	15.54%	70%	1%	10	131	M	5%	18.32
			Waste Heat Recovery	7.77%	80%	26%	15	65	L	1%	1.79
			Process Heat Recovery	7.77%	80%	25%	15	65	M	5%	0.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Beverage and Tobacco	Retrofit	Process Heating (G	Repair Leaks, Insulation and Seals (Drying and	0.00%	30%	5%	10	0	M	5%	4.55
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	30%	5%	10	0	M	5%	4.55
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	1.07%	33%	8%	15	1	L	4%	0.47
			HE Boilers (>300kBTU)	0.71%	49%	19%	20	0	O	15%	3.65
			HE Furnaces (>300kBTU)	0.80%	20%	10%	20	0	O	12%	2.39
			HE Unit Heaters	1.33%	10%	34%	15	1	M	13%	11.90
			Infrared Heater	1.33%	5%	12%	15	1	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	53.27%	49%	19%	20	27	O	15%	3.65
Chemicals	NC	HVAC - Heating	HE (ES) Building Design	2.10%	2%	1%	15	5	L	1%	0.32
			HE (ES) Windows and Skylights	1.05%	5%	1%	15	2	L	1%	0.11
			HE HVAC System Design	2.10%	10%	30%	15	5	M	5%	1.90
			HVAC System Commissioning	0.21%	0%	10%	5	0	L	1%	1.32
			Radiant floor heating	0.21%	50%	12%	30	0	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	1.05%	5%	2%	15	249	L	1%	1.27
			Improved Below-Grade Insulation	1.05%	5%	1%	15	249	L	1%	0.32
			Improved Roof/Ceiling Insulation	1.05%	5%	1%	15	249	L	1%	0.32
			Improved Wall Insulation	1.05%	1%	1%	15	249	L	1%	0.16
			Destratification Fans	0.21%	10%	10%	15	100	M	5%	34.56
			Improve Duct Sealing	2.10%	15%	7%	10	499	M	5%	5.79
			Insulate Pipes/Lines	2.10%	80%	1%	10	499	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.21%	50%	1%	5	50	M	5%	67.94
			Energy Management System	0.21%	10%	10%	10	50	M	5%	1.18
			HVAC System By-pass Timer	0.21%	10%	1%	10	50	L	1%	48.62
			Thermostat Calibration	0.21%	10%	2%	5	50	M	5%	92.00
			Ventilation Controls Installed	0.67%	5%	15%	15	160	M	5%	1.32
			Boiler - Automatic Chemical feed	0.17%	70%	1%	15	40	M	5%	70.58
			Boiler - Flue gas heat recovery	0.21%	70%	2%	15	50	M	5%	12.83
			Boiler - Install Damper Controls	0.17%	70%	5%	15	40	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.17%	65%	8%	15	40	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.17%	20%	15%	15	40	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.17%	40%	25%	15	40	M	5%	6.85
			Boiler O2 Trim Controls	0.17%	30%	2%	10	40	O	6%	10.10
			Heat Recovery for Space Heating	0.09%	0%	1%	20	449	M	5%	9.49
			Gas IR Radiant Heating	0.31%	10%	19%	15	75	M	5%	0.49
			Micro Channel Heat Exchangers	0.71%	5%	5%	15	170	M	5%	4.44
			Exhaust Hood Makeup Air	0.80%	15%	5%	15	190	M	5%	1.33
			Solar ventilation pre-heat	0.08%	50%	15%	15	20	L	1%	3.48
			Increase Use of Zoning	2.10%	20%	15%	20	499	M	5%	0.29
			Boiler Controls / Cx and RCx	0.21%	20%	15%	15	50	M	5%	26.14
			Boiler Tune-Up	0.21%	25%	2%	2	50	M	5%	28.74

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	Retrofit	HVAC - Heating	HVAC System Retrocommissioning	0.21%	0%	10%	5	50	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.21%	20%	10%	5	50	M	5%	26.76
			Programmable Thermostat (incl minimum set-po	0.21%	50%	4%	10	50	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	47.31%	70%	1%	10	11265	M	5%	78.76
			Boiler - Install Damper Controls	47.31%	20%	5%	15	11265	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	4.61%	20%	1%	15	14081	M	5%	2.79
			Boiler Tune-Up	59.14%	25%	6%	2	14081	M	5%	15.47
			Heat Trap	11.83%	80%	5%	5	2816	M	5%	62.51
			Insulate piping, valves, fittings, vessels	23.65%	37%	1%	10	14081	M	5%	5.79
			Improved Condensate Recovery	14.31%	50%	2%	10	14081	H	8%	3.58
			Steam leak repair	9.28%	50%	1%	2	14081	M	5%	63.22
			Steam Trap Maintenance	59.14%	35%	3%	2	14081	O	6%	18.59
			Blowdown Heat Recovery	7.10%	70%	1%	15	14081	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	2.01%	70%	2%	15	14081	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	17.74%	30%	2%	10	14081	O	6%	10.10
			Burner Upgrades, Repair and Replacement	5.91%	5%	2%	10	14081	M	5%	3.27
			Heat Recovery for Hot Water Use	17.74%	50%	30%	15	4224	L	1%	12.83
			Solar Water Heater	0.59%	5%	60%	15	14081	L	1%	0.15
			Install Feedwater Economizers	7.69%	5%	2%	15	14081	M	5%	6.21
			Improve Water Treatment	44.94%	5%	1%	15	14081	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	3.78%	5%	1%	2	14081	M	5%	14.28
			Improve Blowdown Practices	8.28%	5%	1%	15	14081	M	5%	16.41
			Add/Restore Boiler Refractory	2.19%	5%	1%	15	14081	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	5.09%	5%	1%	15	14081	M	5%	42.01
			Reduce Steam System Generating Pressure	5.26%	5%	1%	15	14081	M	5%	71.29
			Other Steam System Improvements and Contro	8.87%	5%	3%	15	14081	M	5%	10.46
			Industry Specific Steam System Optimization M	8.87%	5%	4%	15	14081	M	5%	6.25
		Process Heating (G	Improved Sensors and Process Controls	37.52%	70%	8%	8	8935	M	5%	10.84
			Water Heater Cycling	18.76%	50%	5%	10	4468	M	5%	18.32
			Condensing Heat Exchanger	5.78%	5%	8%	10	1376	M	5%	5.92
			Improved Gas Drying and Heating Technologies	28.89%	10%	13%	15	6880	L	1%	2.67
			Burner Upgrades	28.89%	5%	4%	10	6880	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	8.63%	70%	50%	15	2055	L	1%	3.97
			Insulating Blankets	8.63%	80%	1%	10	2055	M	5%	17.50
			Install Automatic Stack Dampers	6.90%	20%	5%	15	1644	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.04)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	Retrofit	Process Heating (G	Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	37.52%	25%	4%	10	8935	M	5%	17.90
			Reduced Temperature Setpoints	37.52%	70%	19%	1	8935	L	1%	22.59
			Timers	37.52%	70%	1%	10	8935	M	5%	18.32
			Waste Heat Recovery	18.76%	80%	26%	15	4468	L	1%	1.79
			Process Heat Recovery	18.76%	80%	25%	15	4468	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	14.45%	50%	30%	10	3440	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.25%	33%	8%	15	5	L	4%	0.47
			HE Boilers (>300kBTU)	0.17%	49%	19%	20	2	O	15%	3.65
			HE Furnaces (>300kBTU)	0.19%	20%	10%	20	3	O	12%	2.39
			HE Unit Heaters	0.31%	10%	34%	15	6	M	13%	11.90
			Infrared Heater	0.31%	5%	12%	15	6	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	47.31%	49%	19%	20	676	O	15%	3.65
Fabricated Metals	NC	HVAC - Heating	HE (ES) Building Design	20.93%	2%	1%	15	18	L	1%	0.32
			HE (ES) Windows and Skylights	10.47%	5%	1%	15	9	L	1%	0.11
			HE HVAC System Design	20.93%	10%	30%	15	18	M	5%	1.90
			HVAC System Commissioning	2.09%	0%	10%	5	2	L	1%	1.32
			Radiant floor heating	2.09%	50%	12%	30	2	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	10.47%	5%	2%	15	922	L	1%	1.27
			Improved Below-Grade Insulation	10.47%	5%	1%	15	922	L	1%	0.32
			Improved Roof/Ceiling Insulation	10.47%	5%	1%	15	922	L	1%	0.32
			Improved Wall Insulation	10.47%	1%	1%	15	922	L	1%	0.16
			Destratification Fans	2.09%	10%	10%	15	369	M	5%	34.56
			Improve Duct Sealing	20.93%	15%	7%	10	1845	M	5%	5.79
			Insulate Pipes/Lines	20.93%	80%	1%	10	1845	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	2.09%	50%	1%	5	184	M	5%	67.94
			Energy Management System	2.09%	10%	10%	10	184	M	5%	1.18
			HVAC System By-pass Timer	2.09%	10%	1%	10	184	L	1%	48.62
			Thermostat Calibration	2.09%	10%	2%	5	184	M	5%	92.00
			Ventilation Controls Installed	6.70%	5%	15%	15	590	M	5%	1.32
			Boiler - Automatic Chemical feed	1.67%	70%	1%	15	148	M	5%	70.58
			Boiler - Flue gas heat recovery	2.09%	70%	2%	15	184	M	5%	12.83
			Boiler - Install Damper Controls	1.67%	70%	5%	15	148	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	1.67%	65%	8%	15	148	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	1.67%	20%	15%	15	148	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	1.67%	40%	25%	15	148	M	5%	6.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Fabricated Metals	Retrofit	HVAC - Heating	Boiler O2 Trim Controls	1.67%	30%	2%	10	148	O	6%	10.10
			Heat Recovery for Space Heating	0.94%	0%	1%	20	1660	M	5%	9.49
			Gas IR Radiant Heating	3.14%	10%	19%	15	277	M	5%	0.49
			Micro Channel Heat Exchangers	7.12%	5%	5%	15	627	M	5%	4.44
			Exhaust Hood Makeup Air	7.95%	15%	5%	15	701	M	5%	1.33
			Solar ventilation pre-heat	0.84%	50%	15%	15	74	L	1%	3.48
			Increase Use of Zoning	20.93%	20%	15%	20	1845	M	5%	0.29
			Boiler Controls / Cx and RCx	2.09%	20%	15%	15	184	M	5%	26.14
			Boiler Tune-Up	2.09%	25%	2%	2	184	M	5%	28.74
			HVAC System Retrocommissioning	2.09%	0%	10%	5	184	L	1%	0.66
			HVAC System Tune-up/Maintenance	2.09%	20%	10%	5	184	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	2.09%	50%	4%	10	184	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	0.00%	70%	1%	10	0	M	5%	78.76
			Boiler - Install Damper Controls	0.00%	20%	5%	15	0	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	0.00%	20%	1%	15	0	M	5%	2.79
			Boiler Tune-Up	0.00%	25%	6%	2	0	M	5%	15.47
			Heat Trap	0.00%	80%	5%	5	0	M	5%	62.51
			Insulate piping, valves, fittings, vessels	0.00%	37%	1%	10	0	M	5%	5.79
			Improved Condensate Recovery	0.00%	50%	2%	10	0	H	8%	3.58
			Steam leak repair	0.00%	50%	1%	2	0	M	5%	63.22
			Steam Trap Maintenance	0.00%	35%	3%	2	0	O	6%	18.59
			Blowdown Heat Recovery	0.00%	70%	1%	15	0	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	0.00%	70%	2%	15	0	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	0.00%	30%	2%	10	0	O	6%	10.10
			Burner Upgrades, Repair and Replacement	0.00%	5%	2%	10	0	M	5%	3.27
			Heat Recovery for Hot Water Use	0.00%	50%	30%	15	0	L	1%	12.83
			Solar Water Heater	0.00%	5%	60%	15	0	L	1%	0.15
			Install Feedwater Economizers	0.00%	5%	2%	15	0	M	5%	6.21
			Improve Water Treatment	0.00%	5%	1%	15	0	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	0.00%	5%	1%	2	0	M	5%	14.28
			Improve Blowdown Practices	0.00%	5%	1%	15	0	M	5%	16.41
			Add/Restore Boiler Refractory	0.00%	5%	1%	15	0	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	0.00%	5%	1%	15	0	M	5%	42.01
			Reduce Steam System Generating Pressure	0.00%	5%	1%	15	0	M	5%	71.29
			Other Steam System Improvements and Contro	0.00%	5%	3%	15	0	M	5%	10.46
		Process Heating (G	Improved Sensors and Process Controls	62.80%	70%	8%	8	5534	M	5%	10.84
			Water Heater Cycling	31.40%	50%	5%	10	2767	M	5%	18.32
			Condensing Heat Exchanger	0.00%	5%	8%	10	0	M	5%	5.92
			Improved Gas Drying and Heating Technologies	0.00%	10%	13%	15	0	L	1%	2.67
			Burner Upgrades	0.00%	5%	4%	10	0	M	5%	23.87

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Fabricated Metals	Retrofit	Process Heating (C	Emissions Control Improvements (RTO, RCO, F	0.00%	70%	50%	15	0	L	1%	3.97
			Insulating Blankets	0.00%	80%	1%	10	0	M	5%	17.50
			Install Automatic Stack Dampers	0.00%	20%	5%	15	0	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.03)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	62.80%	25%	4%	10	5534	M	5%	17.90
			Reduced Temperature Setpoints	62.80%	70%	19%	1	5534	L	1%	22.59
			Timers	62.80%	70%	1%	10	5534	M	5%	18.32
			Waste Heat Recovery	31.40%	80%	26%	15	2767	L	1%	1.79
			Process Heat Recovery	31.40%	80%	25%	15	2767	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	0.00%	50%	30%	10	0	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	2.51%	33%	8%	15	17	L	4%	0.47
			HE Boilers (>300kBTU)	1.67%	49%	19%	20	9	O	15%	3.65
			HE Furnaces (>300kBTU)	1.88%	20%	10%	20	10	O	12%	2.39
			HE Unit Heaters	3.14%	10%	34%	15	21	M	13%	11.90
			Infrared Heater	3.14%	5%	12%	15	21	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	0.00%	49%	19%	20	0	O	15%	3.65
Food	NC	HVAC - Heating	HE (ES) Building Design	6.64%	2%	1%	15	16	L	1%	0.32
			HE (ES) Windows and Skylights	3.32%	5%	1%	15	8	L	1%	0.11
			HE HVAC System Design	6.64%	10%	30%	15	16	M	5%	1.90
			HVAC System Commissioning	0.66%	0%	10%	5	2	L	1%	1.32
			Radiant floor heating	0.66%	50%	12%	30	2	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	3.32%	5%	2%	15	810	L	1%	1.27
			Improved Below-Grade Insulation	3.32%	5%	1%	15	810	L	1%	0.32
			Improved Roof/Ceiling Insulation	3.32%	5%	1%	15	810	L	1%	0.32
			Improved Wall Insulation	3.32%	1%	1%	15	810	L	1%	0.16
			Destratification Fans	0.66%	10%	10%	15	324	M	5%	34.56
			Improve Duct Sealing	6.64%	15%	7%	10	1620	M	5%	5.79
			Insulate Pipes/Lines	6.64%	80%	1%	10	1620	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.66%	50%	1%	5	162	M	5%	67.94
			Energy Management System	0.66%	10%	10%	10	162	M	5%	1.18
			HVAC System By-pass Timer	0.66%	10%	1%	10	162	L	1%	48.62

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food	Retrofit	HVAC - Heating	Thermostat Calibration	0.66%	10%	2%	5	162	M	5%	92.00
			Ventilation Controls Installed	2.12%	5%	15%	15	518	M	5%	1.32
			Boiler - Automatic Chemical feed	0.53%	70%	1%	15	130	M	5%	70.58
			Boiler - Flue gas heat recovery	0.66%	70%	2%	15	162	M	5%	12.83
			Boiler - Install Damper Controls	0.53%	70%	5%	15	130	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.53%	65%	8%	15	130	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.53%	20%	15%	15	130	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.53%	40%	25%	15	130	M	5%	6.85
			Boiler O2 Trim Controls	0.53%	30%	2%	10	130	O	6%	10.10
			Heat Recovery for Space Heating	0.30%	0%	1%	20	1458	M	5%	9.49
			Gas IR Radiant Heating	1.00%	10%	19%	15	243	M	5%	0.49
			Micro Channel Heat Exchangers	2.26%	5%	5%	15	551	M	5%	4.44
			Exhaust Hood Makeup Air	2.52%	15%	5%	15	616	M	5%	1.33
			Solar ventilation pre-heat	0.27%	50%	15%	15	65	L	1%	3.48
			Increase Use of Zoning	6.64%	20%	15%	20	1620	M	5%	0.29
			Boiler Controls / Cx and RCx	0.66%	20%	15%	15	162	M	5%	26.14
			Boiler Tune-Up	0.66%	25%	2%	2	162	M	5%	28.74
			HVAC System Retrocommissioning	0.66%	0%	10%	5	162	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.66%	20%	10%	5	162	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	0.66%	50%	4%	10	162	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	39.54%	70%	1%	10	9648	M	5%	78.76
			Boiler - Install Damper Controls	39.54%	20%	5%	15	9648	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	3.86%	20%	1%	15	12060	M	5%	2.79
			Boiler Tune-Up	49.43%	25%	6%	2	12060	M	5%	15.47
			Heat Trap	9.89%	80%	5%	5	2412	M	5%	62.51
			Insulate piping, valves, fittings, vessels	19.77%	37%	1%	10	12060	M	5%	5.79
			Improved Condensate Recovery	11.96%	50%	2%	10	12060	H	8%	3.58
			Steam leak repair	7.76%	50%	1%	2	12060	M	5%	63.22
			Steam Trap Maintenance	49.43%	35%	3%	2	12060	O	6%	20.62
			Blowdown Heat Recovery	5.93%	70%	1%	15	12060	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	1.68%	70%	2%	15	12060	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	14.83%	30%	2%	10	12060	O	6%	10.10
			Burner Upgrades, Repair and Replacement	4.94%	5%	2%	10	12060	M	5%	3.27

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food	Retrofit	Steam Production	Heat Recovery for Hot Water Use	14.83%	50%	30%	15	3618	M	5%	12.83
			Solar Water Heater	0.49%	5%	60%	15	12060	L	1%	0.15
			Install Feedwater Economizers	6.43%	5%	2%	15	12060	M	5%	6.21
			Improve Water Treatment	37.57%	5%	1%	15	12060	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	3.16%	5%	1%	2	12060	M	5%	14.28
			Improve Blowdown Practices	6.92%	5%	1%	15	12060	M	5%	16.41
			Add/Restore Boiler Refractory	1.83%	5%	1%	15	12060	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	4.25%	5%	1%	15	12060	M	5%	42.01
			Reduce Steam System Generating Pressure	4.40%	5%	1%	15	12060	M	5%	71.29
			Other Steam System Improvements and Contro	7.41%	5%	3%	15	12060	M	5%	9.29
		Process Heating (G	Improved Sensors and Process Controls	36.70%	70%	8%	8	8955	M	5%	10.84
			Water Heater Cycling	18.35%	50%	5%	10	4478	M	5%	18.32
			Condensing Heat Exchanger	6.61%	5%	8%	10	1612	M	5%	5.92
			Improved Gas Drying and Heating Technologies	33.03%	10%	13%	15	8060	L	1%	2.67
			Burner Upgrades	33.03%	5%	4%	10	8060	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	3.67%	70%	50%	15	896	L	1%	3.97
			Insulating Blankets	3.67%	80%	1%	10	896	M	5%	17.50
			Install Automatic Stack Dampers	2.94%	20%	5%	15	716	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.05)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	36.70%	25%	4%	10	8955	M	5%	17.90
			Reduced Temperature Setpoints	36.70%	70%	19%	1	8955	L	1%	22.59
			Timers	36.70%	70%	1%	10	8955	M	5%	18.32
			Waste Heat Recovery	18.35%	80%	26%	15	4478	L	1%	1.79
			Process Heat Recovery	18.35%	80%	25%	15	4478	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	16.52%	50%	30%	10	4030	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.80%	33%	8%	15	15	L	4%	0.47
			HE Boilers (>300kBTU)	0.53%	49%	19%	20	8	O	15%	3.65
			HE Furnaces (>300kBTU)	0.60%	20%	10%	20	9	O	12%	2.39
			HE Unit Heaters	1.00%	10%	34%	15	19	M	13%	11.90
			Infrared Heater	1.00%	5%	12%	15	19	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	39.54%	49%	19%	20	579	O	15%	3.65

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery	NC	HVAC - Heating	HE (ES) Building Design	37.76%	2%	1%	15	20	L	1%	0.32
			HE (ES) Windows and Skylights	18.88%	5%	1%	15	10	L	1%	0.11
			HE HVAC System Design	37.76%	10%	30%	15	20	M	5%	1.90
			HVAC System Commissioning	3.78%	0%	10%	5	2	L	1%	1.32
			Radiant floor heating	3.78%	50%	12%	30	2	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	18.88%	5%	2%	15	990	L	1%	1.27
			Improved Below-Grade Insulation	18.88%	5%	1%	15	990	L	1%	0.32
			Improved Roof/Ceiling Insulation	18.88%	5%	1%	15	990	L	1%	0.32
			Improved Wall Insulation	18.88%	1%	1%	15	990	L	1%	0.16
			Destratification Fans	3.78%	10%	10%	15	396	M	5%	34.56
			Improve Duct Sealing	37.76%	15%	7%	10	1979	M	5%	5.79
			Insulate Pipes/Lines	37.76%	80%	1%	10	1979	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	3.78%	50%	1%	5	198	M	5%	67.94
			Energy Management System	3.78%	10%	10%	10	198	M	5%	1.18
			HVAC System By-pass Timer	3.78%	10%	1%	10	198	L	1%	48.62
			Thermostat Calibration	3.78%	10%	2%	5	198	M	5%	92.00
			Ventilation Controls Installed	12.08%	5%	15%	15	633	M	5%	1.32
			Boiler - Automatic Chemical feed	3.02%	70%	1%	15	158	M	5%	70.58
			Boiler - Flue gas heat recovery	3.78%	70%	2%	15	198	M	5%	12.83
			Boiler - Install Damper Controls	3.02%	70%	5%	15	158	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	3.02%	65%	8%	15	158	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	3.02%	20%	15%	15	158	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	3.02%	40%	25%	15	158	M	5%	6.85
			Boiler O2 Trim Controls	3.02%	30%	2%	10	158	O	6%	10.10
			Heat Recovery for Space Heating	1.70%	0%	1%	20	1781	M	5%	9.49
			Gas IR Radiant Heating	5.66%	10%	19%	15	297	M	5%	0.49
			Micro Channel Heat Exchangers	12.84%	5%	5%	15	673	M	5%	4.44
			Exhaust Hood Makeup Air	14.35%	15%	5%	15	752	M	5%	1.33
			Solar ventilation pre-heat	1.51%	50%	15%	15	79	L	1%	3.48
			Increase Use of Zoning	37.76%	20%	15%	20	1979	M	5%	0.29
			Boiler Controls / Cx and RCx	3.78%	20%	15%	15	198	M	5%	26.14
			Boiler Tune-Up	3.78%	25%	2%	2	198	M	5%	28.74
			HVAC System Retrocommissioning	3.78%	0%	10%	5	198	L	1%	0.66
			HVAC System Tune-up/Maintenance	3.78%	20%	10%	5	198	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	3.78%	50%	4%	10	198	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	14.58%	70%	1%	10	764	M	5%	78.76
			Boiler - Install Damper Controls	14.58%	20%	5%	15	764	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	1.42%	20%	1%	15	956	M	5%	2.79
			Boiler Tune-Up	18.23%	25%	6%	2	956	M	5%	15.47
			Heat Trap	3.65%	80%	5%	5	191	M	5%	62.51

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery	Retrofit	Steam Production	Insulate piping, valves, fittings, vessels	7.29%	37%	1%	10	956	M	5%	5.79
			Improved Condensate Recovery	4.41%	50%	2%	10	956	H	8%	3.58
			Steam leak repair	2.86%	50%	1%	2	956	M	5%	63.22
			Steam Trap Maintenance	18.23%	35%	3%	2	956	O	6%	18.59
			Blowdown Heat Recovery	2.19%	70%	1%	15	956	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	0.62%	70%	2%	15	956	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	5.47%	30%	2%	10	956	O	6%	10.10
			Burner Upgrades, Repair and Replacement	1.82%	5%	2%	10	956	M	5%	3.27
			Heat Recovery for Hot Water Use	5.47%	50%	30%	15	287	L	1%	12.83
			Solar Water Heater	0.18%	5%	60%	15	956	L	1%	0.15
			Install Feedwater Economizers	2.37%	5%	2%	15	956	M	5%	6.21
			Improve Water Treatment	13.85%	5%	1%	15	956	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	1.17%	5%	1%	2	956	M	5%	14.28
			Improve Blowdown Practices	2.55%	5%	1%	15	956	M	5%	16.41
			Add/Restore Boiler Refractory	0.67%	5%	1%	15	956	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	1.57%	5%	1%	15	956	M	5%	42.01
			Reduce Steam System Generating Pressure	1.62%	5%	1%	15	956	M	5%	71.29
			Other Steam System Improvements and Contro	2.73%	5%	3%	15	956	M	5%	10.46
		Process Heating (C	Improved Sensors and Process Controls	37.76%	70%	8%	8	1979	M	5%	10.84
			Water Heater Cycling	18.88%	50%	5%	10	990	M	5%	18.32
			Condensing Heat Exchanger	0.76%	5%	8%	10	40	M	5%	5.92
			Improved Gas Drying and Heating Technologies	3.78%	10%	13%	15	198	L	1%	2.67
			Burner Upgrades	3.78%	5%	4%	10	198	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	3.78%	70%	50%	15	198	L	1%	3.97
			Insulating Blankets	3.78%	80%	1%	10	198	M	5%	17.50
			Install Automatic Stack Dampers	3.02%	20%	5%	15	158	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.03)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	37.76%	25%	4%	10	1979	M	5%	17.90
			Reduced Temperature Setpoints	37.76%	70%	19%	1	1979	L	1%	22.59
			Timers	37.76%	70%	1%	10	1979	M	5%	18.32
			Waste Heat Recovery	18.88%	80%	26%	15	990	L	1%	1.79
			Process Heat Recovery	18.88%	80%	25%	15	990	M	5%	0.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery	Retrofit	Process Heating (G	Repair Leaks, Insulation and Seals (Drying and	1.89%	50%	30%	10	99	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	4.53%	33%	8%	15	18	L	4%	0.47
			HE Boilers (>300kBTU)	3.02%	49%	19%	20	10	O	15%	3.65
			HE Furnaces (>300kBTU)	3.40%	20%	10%	20	11	O	12%	2.39
			HE Unit Heaters	5.66%	10%	34%	15	23	M	13%	11.90
			Infrared Heater	5.66%	5%	12%	15	23	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	14.58%	49%	19%	20	46	O	15%	3.65
Metals Primary	NC	HVAC - Heating	HE (ES) Building Design	6.64%	2%	1%	15	8	L	1%	0.32
			HE (ES) Windows and Skylights	3.32%	5%	1%	15	4	L	1%	0.11
			HE HVAC System Design	6.64%	10%	30%	15	8	M	5%	1.90
			HVAC System Commissioning	0.66%	0%	10%	5	1	L	1%	1.32
			Radiant floor heating	0.66%	50%	12%	30	1	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	3.32%	5%	2%	15	397	L	1%	1.27
			Improved Below-Grade Insulation	3.32%	5%	1%	15	397	L	1%	0.32
			Improved Roof/Ceiling Insulation	3.32%	5%	1%	15	397	L	1%	0.32
			Improved Wall Insulation	3.32%	1%	1%	15	397	L	1%	0.16
			Destratification Fans	0.66%	10%	10%	15	159	M	5%	34.56
			Improve Duct Sealing	6.64%	15%	7%	10	794	M	5%	5.79
			Insulate Pipes/Lines	6.64%	80%	1%	10	794	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.66%	50%	1%	5	79	M	5%	67.94
			Energy Management System	0.66%	10%	10%	10	79	M	5%	1.18
			HVAC System By-pass Timer	0.66%	10%	1%	10	79	L	1%	48.62
			Thermostat Calibration	0.66%	10%	2%	5	79	M	5%	92.00
			Ventilation Controls Installed	2.12%	5%	15%	15	254	M	5%	1.32
			Boiler - Automatic Chemical feed	0.53%	70%	1%	15	64	M	5%	70.58
			Boiler - Flue gas heat recovery	0.66%	70%	2%	15	79	M	5%	12.83
			Boiler - Install Damper Controls	0.53%	70%	5%	15	64	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.53%	65%	8%	15	64	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.53%	20%	15%	15	64	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.53%	40%	25%	15	64	M	5%	6.85
			Boiler O2 Trim Controls	0.53%	30%	2%	10	64	O	6%	10.10
			Heat Recovery for Space Heating	0.30%	0%	1%	20	715	M	5%	9.49
			Gas IR Radiant Heating	1.00%	10%	19%	15	119	M	5%	0.49
			Micro Channel Heat Exchangers	2.26%	5%	5%	15	270	M	5%	4.44
			Exhaust Hood Makeup Air	2.52%	15%	5%	15	302	M	5%	1.33
			Solar ventilation pre-heat	0.27%	50%	15%	15	32	L	1%	3.48
			Increase Use of Zoning	6.64%	20%	15%	20	794	M	5%	0.29
			Boiler Controls / Cx and RCx	0.66%	20%	15%	15	79	M	5%	26.14
			Boiler Tune-Up	0.66%	25%	2%	2	79	M	5%	28.74

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Metals Primary	Retrofit	HVAC - Heating	HVAC System Retrocommissioning	0.66%	0%	10%	5	79	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.66%	20%	10%	5	79	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	0.66%	50%	4%	10	79	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	8.52%	70%	1%	10	1019	M	5%	78.76
			Boiler - Install Damper Controls	8.52%	20%	5%	15	1019	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	0.83%	20%	1%	15	1274	M	5%	2.79
			Boiler Tune-Up	10.66%	25%	6%	2	1274	M	5%	15.47
			Heat Trap	2.13%	80%	5%	5	255	M	5%	62.51
			Insulate piping, valves, fittings, vessels	4.26%	37%	1%	10	1274	M	5%	5.79
			Improved Condensate Recovery	2.58%	50%	2%	10	1274	H	8%	3.58
			Steam leak repair	1.67%	50%	1%	2	1274	M	5%	63.22
			Steam Trap Maintenance	10.66%	35%	3%	2	1274	O	6%	18.59
			Blowdown Heat Recovery	1.28%	70%	1%	15	1274	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	0.36%	70%	2%	15	1274	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	3.20%	30%	2%	10	1274	O	6%	10.10
			Burner Upgrades, Repair and Replacement	1.07%	5%	2%	10	1274	M	5%	3.27
			Heat Recovery for Hot Water Use	3.20%	50%	30%	15	382	L	1%	12.83
			Solar Water Heater	0.11%	5%	60%	15	1274	L	1%	0.15
			Install Feedwater Economizers	1.39%	5%	2%	15	1274	M	5%	6.21
			Improve Water Treatment	8.10%	5%	1%	15	1274	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	0.68%	5%	1%	2	1274	M	5%	14.28
			Improve Blowdown Practices	1.49%	5%	1%	15	1274	M	5%	16.41
			Add/Restore Boiler Refractory	0.39%	5%	1%	15	1274	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	0.92%	5%	1%	15	1274	M	5%	42.01
			Reduce Steam System Generating Pressure	0.95%	5%	1%	15	1274	M	5%	71.29
			Other Steam System Improvements and Contro	1.60%	5%	3%	15	1274	M	5%	10.46
		Process Heating (C	Improved Sensors and Process Controls	79.68%	70%	8%	8	9529	M	5%	10.84
			Water Heater Cycling	39.84%	50%	5%	10	4764	M	5%	18.32
			Condensing Heat Exchanger	5.58%	5%	8%	10	667	M	5%	5.92
			Improved Gas Drying and Heating Technologies	27.89%	10%	13%	15	3335	L	1%	2.67
			Burner Upgrades	27.89%	5%	4%	10	3335	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	7.97%	70%	50%	15	953	L	1%	3.97
			Insulating Blankets	7.97%	80%	1%	10	953	M	5%	17.50
			Install Automatic Stack Dampers	6.37%	20%	5%	15	762	M	5%	21.39
			Metal Casting -Burner Upgrades	39.84%	5%	2%	10	4764	M	5%	12.70
			Electric Preheat	39.84%	10%	10%	8	4764	M	5%	(0.06)
			Electric Melting - Fuel Switch	39.84%	0%	100%	10	4764	M	5%	(0.03)
			Install Stack Melting Furnace	1.99%	0%	50%	20	238	M	5%	11.77
			Metal Casting - Insulating Blankets	39.84%	80%	1%	10	4764	M	5%	17.50
			Insulation - Refractory Fibers	39.84%	30%	5%	15	4764	M	5%	5.23

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Metals Primary	Retrofit	Process Heating (G	Preheat combustion air	39.84%	50%	12%	15	4764	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	19.92%	10%	11%	5	2382	L	1%	6.09
			Recuperator	19.92%	50%	30%	10	2382	L	1%	17.50
			Recuperative Burners Installed	19.92%	50%	5%	10	2382	L	1%	1.57
			Regenerator	7.97%	30%	5%	10	953	L	1%	4.55
			Load Management	79.68%	25%	4%	10	9529	M	5%	17.90
			Reduced Temperature Setpoints	79.68%	70%	19%	1	9529	L	1%	22.59
			Timers	79.68%	70%	1%	10	9529	M	5%	18.32
			Waste Heat Recovery	39.84%	80%	26%	15	4764	L	1%	1.79
			Process Heat Recovery	39.84%	80%	25%	15	4764	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	13.94%	50%	30%	10	1668	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	19.92%	50%	30%	10	2382	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.80%	33%	8%	15	7	L	4%	0.47
			HE Boilers (>300kBTU)	0.53%	49%	19%	20	4	O	15%	3.65
			HE Furnaces (>300kBTU)	0.60%	20%	10%	20	4	O	12%	2.39
			HE Unit Heaters	1.00%	10%	34%	15	9	M	13%	11.90
			Infrared Heater	1.00%	5%	12%	15	9	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	8.52%	49%	19%	20	61	O	15%	3.65
Other	NC	HVAC - Heating	HE (ES) Building Design	7.61%	2%	1%	15	11	L	1%	0.32
			HE (ES) Windows and Skylights	3.80%	5%	1%	15	6	L	1%	0.11
			HE HVAC System Design	7.61%	10%	30%	15	11	M	5%	1.90
			HVAC System Commissioning	0.76%	0%	10%	5	1	L	1%	1.32
			Radiant floor heating	0.76%	50%	12%	30	1	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	3.80%	5%	2%	15	559	L	1%	1.27
			Improved Below-Grade Insulation	3.80%	5%	1%	15	559	L	1%	0.32
			Improved Roof/Ceiling Insulation	3.80%	5%	1%	15	559	L	1%	0.32
			Improved Wall Insulation	3.80%	1%	1%	15	559	L	1%	0.16
			Destratification Fans	0.76%	10%	10%	15	224	M	5%	34.56
			Improve Duct Sealing	7.61%	15%	7%	10	1118	M	5%	5.79
			Insulate Pipes/Lines	7.61%	80%	1%	10	1118	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.76%	50%	1%	5	112	M	5%	67.94
			Energy Management System	0.76%	10%	10%	10	112	M	5%	1.18
			HVAC System By-pass Timer	0.76%	10%	1%	10	112	L	1%	48.62
			Thermostat Calibration	0.76%	10%	2%	5	112	M	5%	92.00
			Ventilation Controls Installed	2.43%	5%	15%	15	358	M	5%	1.32
			Boiler - Automatic Chemical feed	0.61%	70%	1%	15	89	M	5%	70.58
			Boiler - Flue gas heat recovery	0.76%	70%	2%	15	112	M	5%	12.83
			Boiler - Install Damper Controls	0.61%	70%	5%	15	89	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.61%	65%	8%	15	89	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.61%	20%	15%	15	89	M	5%	2.79

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	HVAC - Heating	Boiler - Steam to Hot Water Conversion	0.61%	40%	25%	15	89	M	5%	6.85
			Boiler O2 Trim Controls	0.61%	30%	2%	10	89	O	6%	10.10
			Heat Recovery for Space Heating	0.34%	0%	1%	20	1007	M	5%	9.49
			Gas IR Radiant Heating	1.14%	10%	19%	15	168	M	5%	0.49
			Micro Channel Heat Exchangers	2.59%	5%	5%	15	380	M	5%	4.44
			Exhaust Hood Makeup Air	2.89%	15%	5%	15	425	M	5%	1.33
			Solar ventilation pre-heat	0.30%	50%	15%	15	45	L	1%	3.48
			Increase Use of Zoning	7.61%	20%	15%	20	1118	M	5%	0.29
			Boiler Controls / Cx and RCx	0.76%	20%	15%	15	112	M	5%	26.14
			Boiler Tune-Up	0.76%	25%	2%	2	112	M	5%	28.74
			HVAC System Retrocommissioning	0.76%	0%	10%	5	112	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.76%	20%	10%	5	112	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	0.76%	50%	4%	10	112	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	31.55%	70%	1%	10	4639	M	5%	78.76
			Boiler - Install Damper Controls	31.55%	20%	5%	15	4639	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	3.08%	20%	1%	15	5799	M	5%	2.79
			Boiler Tune-Up	39.43%	25%	6%	2	5799	M	5%	15.47
			Heat Trap	7.89%	80%	5%	5	1160	M	5%	62.51
			Insulate piping, valves, fittings, vessels	15.77%	37%	1%	10	5799	M	5%	5.79
			Improved Condensate Recovery	9.54%	50%	2%	10	5799	H	8%	3.58
			Steam leak repair	6.19%	50%	1%	2	5799	M	5%	63.22
			Steam Trap Maintenance	39.43%	35%	3%	2	5799	O	6%	18.59
			Blowdown Heat Recovery	4.73%	70%	1%	15	5799	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	1.34%	70%	2%	15	5799	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	11.83%	30%	2%	10	5799	O	6%	10.10
			Burner Upgrades, Repair and Replacement	3.94%	5%	2%	10	5799	M	5%	3.27
			Heat Recovery for Hot Water Use	11.83%	50%	30%	15	1740	L	1%	12.83
			Solar Water Heater	0.39%	5%	60%	15	5799	L	1%	0.15
			Install Feedwater Economizers	5.13%	5%	2%	15	5799	M	5%	6.21
			Improve Water Treatment	29.97%	5%	1%	15	5799	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	2.52%	5%	1%	2	5799	M	5%	14.28
			Improve Blowdown Practices	5.52%	5%	1%	15	5799	M	5%	16.41
			Add/Restore Boiler Refractory	1.46%	5%	1%	15	5799	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	3.39%	5%	1%	15	5799	M	5%	42.01
			Reduce Steam System Generating Pressure	3.51%	5%	1%	15	5799	M	5%	71.29
			Other Steam System Improvements and Contro	5.92%	5%	3%	15	5799	M	5%	10.46
			Industry Specific Steam System Optimization M	5.92%	5%	4%	15	5799	L	1%	6.25
		Process Heating (G	Improved Sensors and Process Controls	50.02%	70%	8%	8	7355	M	5%	10.84
			Water Heater Cycling	25.01%	50%	5%	10	3678	M	5%	18.32
			Condensing Heat Exchanger	1.00%	5%	8%	10	147	M	5%	5.92

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	Process Heating (G	Improved Gas Drying and Heating Technologies	5.00%	10%	13%	15	736	L	1%	2.67
			Burner Upgrades	5.00%	5%	4%	10	736	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	5.00%	70%	50%	15	736	L	1%	3.97
			Insulating Blankets	5.00%	80%	1%	10	736	M	5%	17.50
			Install Automatic Stack Dampers	4.00%	20%	5%	15	588	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.03)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	M	5%	4.55
			Load Management	50.02%	25%	4%	10	7355	M	5%	17.90
			Reduced Temperature Setpoints	50.02%	70%	19%	1	7355	L	1%	22.59
			Timers	50.02%	70%	1%	10	7355	M	5%	18.32
			Waste Heat Recovery	25.01%	80%	26%	15	3678	L	1%	1.79
			Process Heat Recovery	25.01%	80%	25%	15	3678	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	2.50%	50%	30%	10	368	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.91%	33%	8%	15	10	L	4%	0.47
			HE Boilers (>300kBTU)	0.61%	49%	19%	20	5	O	15%	3.65
			HE Furnaces (>300kBTU)	0.68%	20%	10%	20	6	O	12%	2.39
			HE Unit Heaters	1.14%	10%	34%	15	13	M	13%	11.90
			Infrared Heater	1.14%	5%	12%	15	13	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	31.55%	49%	19%	20	278	O	15%	3.65
Plastics and Rubber	NC	HVAC - Heating	HE (ES) Building Design	20.00%	2%	1%	15	6	L	1%	0.32
			HE (ES) Windows and Skylights	10.00%	5%	1%	15	3	L	1%	0.11
			HE HVAC System Design	20.00%	10%	30%	15	6	M	5%	1.90
			HVAC System Commissioning	2.00%	0%	10%	5	1	L	1%	1.32
			Radiant floor heating	2.00%	50%	12%	30	1	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	10.00%	5%	2%	15	296	L	1%	1.27
			Improved Below-Grade Insulation	10.00%	5%	1%	15	296	L	1%	0.32
			Improved Roof/Ceiling Insulation	10.00%	5%	1%	15	296	L	1%	0.32
			Improved Wall Insulation	10.00%	1%	1%	15	296	L	1%	0.16
			Destratification Fans	2.00%	10%	10%	15	118	M	5%	34.56
			Improve Duct Sealing	20.00%	15%	7%	10	591	M	5%	5.79
			Insulate Pipes/Lines	20.00%	80%	1%	10	591	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	2.00%	50%	1%	5	59	M	5%	67.94

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Plastics and Rubber	Retrofit	HVAC - Heating	Energy Management System	2.00%	10%	10%	10	59	M	5%	1.18
			HVAC System By-pass Timer	2.00%	10%	1%	10	59	L	1%	48.62
			Thermostat Calibration	2.00%	10%	2%	5	59	M	5%	92.00
			Ventilation Controls Installed	6.40%	5%	15%	15	189	M	5%	1.32
			Boiler - Automatic Chemical feed	1.60%	70%	1%	15	47	M	5%	70.58
			Boiler - Flue gas heat recovery	2.00%	70%	2%	15	59	M	5%	12.83
			Boiler - Install Damper Controls	1.60%	70%	5%	15	47	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	1.60%	65%	8%	15	47	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	1.60%	20%	15%	15	47	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	1.60%	40%	25%	15	47	M	5%	6.85
			Boiler O2 Trim Controls	1.60%	30%	2%	10	47	O	6%	10.10
			Heat Recovery for Space Heating	0.90%	0%	1%	20	532	M	5%	9.49
			Gas IR Radiant Heating	3.00%	10%	19%	15	89	M	5%	0.49
			Micro Channel Heat Exchangers	6.80%	5%	5%	15	201	M	5%	4.44
			Exhaust Hood Makeup Air	7.60%	15%	5%	15	225	M	5%	1.33
			Solar ventilation pre-heat	0.80%	50%	15%	15	24	L	1%	3.48
			Increase Use of Zoning	20.00%	20%	15%	20	591	M	5%	0.29
			Boiler Controls / Cx and RCx	2.00%	20%	15%	15	59	M	5%	26.14
			Boiler Tune-Up	2.00%	25%	2%	2	59	M	5%	28.74
			HVAC System Retrocommissioning	2.00%	0%	10%	5	59	L	1%	0.66
			HVAC System Tune-up/Maintenance	2.00%	20%	10%	5	59	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	2.00%	50%	4%	10	59	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	32.00%	70%	1%	10	946	M	5%	78.76
			Boiler - Install Damper Controls	32.00%	20%	5%	15	946	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	3.12%	20%	1%	15	1183	M	5%	2.79
			Boiler Tune-Up	40.00%	25%	6%	2	1183	M	5%	15.47
			Heat Trap	8.00%	80%	5%	5	237	M	5%	62.51
			Insulate piping, valves, fittings, vessels	16.00%	37%	1%	10	1183	M	5%	5.79
			Improved Condensate Recovery	9.68%	50%	2%	10	1183	H	8%	3.58
			Steam leak repair	6.28%	50%	1%	2	1183	M	5%	63.22
			Steam Trap Maintenance	40.00%	35%	3%	2	1183	O	6%	18.59
			Blowdown Heat Recovery	4.80%	70%	1%	15	1183	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	1.36%	70%	2%	15	1183	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	12.00%	30%	2%	10	1183	O	6%	10.10
			Burner Upgrades, Repair and Replacement	4.00%	5%	2%	10	1183	M	5%	3.27
			Heat Recovery for Hot Water Use	12.00%	50%	30%	15	355	L	1%	12.83
			Solar Water Heater	0.40%	5%	60%	15	1183	L	1%	0.15
			Install Feedwater Economizers	5.20%	5%	2%	15	1183	M	5%	6.21
			Improve Water Treatment	30.40%	5%	1%	15	1183	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	2.56%	5%	1%	2	1183	M	5%	14.28

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Plastics and Rubber	Retrofit	Steam Production	Improve Blowdown Practices	5.60%	5%	1%	15	1183	M	5%	16.41
			Add/Restore Boiler Refractory	1.48%	5%	1%	15	1183	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	3.44%	5%	1%	15	1183	M	5%	42.01
			Reduce Steam System Generating Pressure	3.56%	5%	1%	15	1183	M	5%	71.29
			Other Steam System Improvements and Contro	6.00%	5%	3%	15	1183	M	5%	10.46
		Process Heating (C	Improved Sensors and Process Controls	30.00%	70%	8%	8	887	M	5%	10.84
			Water Heater Cycling	15.00%	50%	5%	10	444	M	5%	18.32
			Condensing Heat Exchanger	1.50%	5%	8%	10	44	M	5%	5.92
			Improved Gas Drying and Heating Technologies	7.50%	10%	13%	15	222	L	1%	2.67
			Burner Upgrades	7.50%	5%	4%	10	222	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	7.50%	70%	50%	15	222	L	1%	3.97
			Insulating Blankets	7.50%	80%	1%	10	222	M	5%	17.50
			Install Automatic Stack Dampers	6.00%	20%	5%	15	177	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.04)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	30.00%	25%	4%	10	887	M	5%	17.90
			Reduced Temperature Setpoints	30.00%	70%	19%	1	887	L	1%	22.59
			Timers	30.00%	70%	1%	10	887	M	5%	18.32
			Waste Heat Recovery	15.00%	80%	26%	15	444	L	1%	1.79
			Process Heat Recovery	15.00%	80%	25%	15	444	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	3.75%	50%	30%	10	111	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	2.40%	33%	8%	15	5	L	4%	0.47
			HE Boilers (>300kBTU)	1.60%	49%	19%	20	3	O	15%	3.65
			HE Furnaces (>300kBTU)	1.80%	20%	10%	20	3	O	12%	2.39
			HE Unit Heaters	3.00%	10%	34%	15	7	M	13%	11.90
			Infrared Heater	3.00%	5%	12%	15	7	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	32.00%	49%	19%	20	57	O	15%	3.65

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Pulp and Paper	NC	HVAC - Heating	HE (ES) Building Design	4.16%	2%	1%	15	13	L	1%	0.32
			HE (ES) Windows and Skylights	2.08%	5%	1%	15	6	L	1%	0.11
			HE HVAC System Design	4.16%	10%	30%	15	13	M	5%	1.90
			HVAC System Commissioning	0.42%	0%	10%	5	1	L	1%	1.32
			Radiant floor heating	0.42%	50%	12%	30	1	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	2.08%	5%	2%	15	638	L	1%	1.27
			Improved Below-Grade Insulation	2.08%	5%	1%	15	638	L	1%	0.32
			Improved Roof/Ceiling Insulation	2.08%	5%	1%	15	638	L	1%	0.32
			Improved Wall Insulation	2.08%	1%	1%	15	638	L	1%	0.16
			Destratification Fans	0.42%	10%	10%	15	255	M	5%	34.56
			Improve Duct Sealing	4.16%	15%	7%	10	1276	M	5%	5.79
			Insulate Pipes/Lines	4.16%	80%	1%	10	1276	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.42%	50%	1%	5	128	M	5%	67.94
			Energy Management System	0.42%	10%	10%	10	128	M	5%	1.18
			HVAC System By-pass Timer	0.42%	10%	1%	10	128	L	1%	48.62
			Thermostat Calibration	0.42%	10%	2%	5	128	M	5%	92.00
			Ventilation Controls Installed	1.33%	5%	15%	15	408	M	5%	1.32
			Boiler - Automatic Chemical feed	0.33%	70%	1%	15	102	M	5%	70.58
			Boiler - Flue gas heat recovery	0.42%	70%	2%	15	128	M	5%	12.83
			Boiler - Install Damper Controls	0.33%	70%	5%	15	102	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.33%	65%	8%	15	102	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.33%	20%	15%	15	102	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.33%	40%	25%	15	102	M	5%	6.85
			Boiler O2 Trim Controls	0.33%	30%	2%	10	102	O	6%	10.10
			Heat Recovery for Space Heating	0.19%	0%	1%	20	1148	M	5%	9.49
			Gas IR Radiant Heating	0.62%	10%	19%	15	191	M	5%	0.49
			Micro Channel Heat Exchangers	1.41%	5%	5%	15	434	M	5%	4.44
			Exhaust Hood Makeup Air	1.58%	15%	5%	15	485	M	5%	1.33
			Solar ventilation pre-heat	0.17%	50%	15%	15	51	L	1%	3.48
			Increase Use of Zoning	4.16%	20%	15%	20	1276	M	5%	0.29
			Boiler Controls / Cx and RCx	0.42%	20%	15%	15	128	M	5%	26.14
			Boiler Tune-Up	0.42%	25%	2%	2	128	M	5%	28.74
			HVAC System Retrocommissioning	0.42%	0%	10%	5	128	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.42%	20%	10%	5	128	M	5%	26.76
			Programmable Thermostat (incl minimum set-p	0.42%	50%	4%	10	128	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	52.17%	70%	1%	10	16007	M	5%	78.76
			Boiler - Install Damper Controls	52.17%	20%	5%	15	16007	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	5.09%	20%	1%	15	20009	M	5%	2.79
			Boiler Tune-Up	65.21%	25%	6%	2	20009	M	5%	15.47
			Heat Trap	13.04%	80%	5%	5	4002	M	5%	62.51

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Pulp and Paper	Retrofit	Steam Production	Insulate piping, valves, fittings, vessels	26.08%	37%	1%	10	20009	M	5%	5.79
			Improved Condensate Recovery	15.78%	50%	2%	10	20009	H	8%	3.58
			Steam leak repair	10.24%	50%	1%	2	20009	M	5%	63.22
			Steam Trap Maintenance	65.21%	35%	3%	2	20009	O	6%	18.59
			Blowdown Heat Recovery	7.82%	70%	1%	15	20009	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	2.22%	70%	2%	15	20009	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	19.56%	30%	2%	10	20009	O	6%	10.10
			Burner Upgrades, Repair and Replacement	6.52%	5%	2%	10	20009	M	5%	3.27
			Heat Recovery for Hot Water Use	19.56%	50%	30%	15	6003	L	1%	12.83
			Solar Water Heater	0.65%	5%	60%	15	20009	L	1%	0.15
			Install Feedwater Economizers	8.48%	5%	2%	15	20009	M	5%	6.21
			Improve Water Treatment	49.56%	5%	1%	15	20009	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	4.17%	5%	1%	2	20009	M	5%	14.28
			Improve Blowdown Practices	9.13%	5%	1%	15	20009	M	5%	16.41
			Add/Restore Boiler Refractory	2.41%	5%	1%	15	20009	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	5.61%	5%	1%	15	20009	M	5%	42.01
			Reduce Steam System Generating Pressure	5.80%	5%	1%	15	20009	M	5%	71.29
			Other Steam System Improvements and Contro	9.78%	5%	3%	15	20009	M	5%	10.46
			Industry Specific Steam System Optimization M	9.78%	5%	7%	15	20009	M	5%	6.25
		Process Heating (C	Improved Sensors and Process Controls	27.57%	70%	8%	8	8460	M	5%	10.84
			Water Heater Cycling	13.79%	50%	5%	10	4230	M	5%	18.32
			Condensing Heat Exchanger	4.03%	5%	8%	10	1235	M	5%	5.92
			Improved Gas Drying and Heating Technologies	20.13%	10%	13%	15	6176	L	1%	2.67
			Burner Upgrades	20.13%	5%	4%	10	6176	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	7.44%	70%	50%	15	2284	L	1%	3.97
			Insulating Blankets	7.44%	80%	1%	10	2284	M	5%	17.50
			Install Automatic Stack Dampers	5.96%	20%	5%	15	1827	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.04)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	27.57%	25%	4%	10	8460	M	5%	17.90
			Reduced Temperature Setpoints	27.57%	70%	19%	1	8460	L	1%	22.59
			Timers	27.57%	70%	1%	10	8460	M	5%	18.32
			Waste Heat Recovery	13.79%	80%	26%	15	4230	L	1%	1.79

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Pulp and Paper	Retrofit	Process Heating (G	Process Heat Recovery	13.79%	80%	25%	15	4230	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	10.06%	50%	30%	10	3088	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.50%	33%	8%	15	12	L	4%	0.47
			HE Boilers (>300kBTU)	0.33%	49%	19%	20	6	O	15%	3.65
			HE Furnaces (>300kBTU)	0.37%	20%	10%	20	7	O	12%	2.39
			HE Unit Heaters	0.62%	10%	34%	15	15	M	13%	11.90
			Infrared Heater	0.62%	5%	12%	15	15	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	52.17%	49%	19%	20	960	O	15%	3.65
Transport Equipment	NC	HVAC - Heating	HE (ES) Building Design	32.15%	2%	1%	15	11	L	1%	0.32
			HE (ES) Windows and Skylights	16.08%	5%	1%	15	6	L	1%	0.11
			HE HVAC System Design	32.15%	10%	30%	15	11	M	5%	1.90
			HVAC System Commissioning	3.22%	0%	10%	5	1	L	1%	1.32
			Radiant floor heating	3.22%	50%	12%	30	1	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	16.08%	5%	2%	15	564	L	1%	1.27
			Improved Below-Grade Insulation	16.08%	5%	1%	15	564	L	1%	0.32
			Improved Roof/Ceiling Insulation	16.08%	5%	1%	15	564	L	1%	0.32
			Improved Wall Insulation	16.08%	1%	1%	15	564	L	1%	0.16
			Destratification Fans	3.22%	10%	10%	15	225	M	5%	34.56
			Improve Duct Sealing	32.15%	15%	7%	10	1127	M	5%	5.79
			Insulate Pipes/Lines	32.15%	80%	1%	10	1127	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	3.22%	50%	1%	5	113	M	5%	67.94
			Energy Management System	3.22%	10%	10%	10	113	M	5%	1.18
			HVAC System By-pass Timer	3.22%	10%	1%	10	113	L	1%	48.62
			Thermostat Calibration	3.22%	10%	2%	5	113	M	5%	92.00
			Ventilation Controls Installed	10.29%	5%	15%	15	361	M	5%	1.32
			Boiler - Automatic Chemical feed	2.57%	70%	1%	15	90	M	5%	70.58
			Boiler - Flue gas heat recovery	3.22%	70%	2%	15	113	M	5%	12.83
			Boiler - Install Damper Controls	2.57%	70%	5%	15	90	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	2.57%	65%	8%	15	90	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	2.57%	20%	15%	15	90	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	2.57%	40%	25%	15	90	M	5%	6.85
			Boiler O2 Trim Controls	2.57%	30%	2%	10	90	O	6%	10.10
			Heat Recovery for Space Heating	1.45%	0%	1%	20	1014	M	5%	9.49
			Gas IR Radiant Heating	4.82%	10%	19%	15	169	M	5%	0.49
			Micro Channel Heat Exchangers	10.93%	5%	5%	15	383	M	5%	4.44
			Exhaust Hood Makeup Air	12.22%	15%	5%	15	428	M	5%	1.33
			Solar ventilation pre-heat	1.29%	50%	15%	15	45	L	1%	3.48
			Increase Use of Zoning	32.15%	20%	15%	20	1127	M	5%	0.29
			Boiler Controls / Cx and RCx	3.22%	20%	15%	15	113	M	5%	26.14

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Transport Equipment	Retrofit	HVAC - Heating	Boiler Tune-Up	3.22%	25%	2%	2	113	M	5%	28.74
			HVAC System Retrocommissioning	3.22%	0%	10%	5	113	L	1%	0.66
			HVAC System Tune-up/Maintenance	3.22%	20%	10%	5	113	M	5%	26.76
			Programmable Thermostat (incl minimum set-po	3.22%	50%	4%	10	113	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	21.08%	70%	1%	10	739	M	5%	78.76
			Boiler - Install Damper Controls	21.08%	20%	5%	15	739	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	2.06%	20%	1%	15	924	M	5%	2.79
			Boiler Tune-Up	26.35%	25%	6%	2	924	M	5%	15.47
			Heat Trap	5.27%	80%	5%	5	185	M	5%	62.51
			Insulate piping, valves, fittings, vessels	10.54%	37%	1%	10	924	M	5%	5.79
			Improved Condensate Recovery	6.38%	50%	2%	10	924	H	8%	3.58
			Steam leak repair	4.14%	50%	1%	2	924	M	5%	63.22
			Steam Trap Maintenance	26.35%	35%	3%	2	924	O	6%	18.59
			Blowdown Heat Recovery	3.16%	70%	1%	15	924	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	0.90%	70%	2%	15	924	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	7.91%	30%	2%	10	924	O	6%	10.10
			Burner Upgrades, Repair and Replacement	2.64%	5%	2%	10	924	M	5%	3.27
			Heat Recovery for Hot Water Use	7.91%	50%	30%	15	277	L	1%	12.83
			Solar Water Heater	0.26%	5%	60%	15	924	L	1%	0.15
			Install Feedwater Economizers	3.43%	5%	2%	15	924	M	5%	6.21
			Improve Water Treatment	20.03%	5%	1%	15	924	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	1.69%	5%	1%	2	924	M	5%	14.28
			Improve Blowdown Practices	3.69%	5%	1%	15	924	M	5%	16.41
			Add/Restore Boiler Refractory	0.98%	5%	1%	15	924	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	2.27%	5%	1%	15	924	M	5%	42.01
			Reduce Steam System Generating Pressure	2.35%	5%	1%	15	924	M	5%	71.29
			Other Steam System Improvements and Contro	3.95%	5%	3%	15	924	M	5%	10.46
		Process Heating (G	Improved Sensors and Process Controls	32.15%	70%	8%	8	1127	M	5%	10.84
			Water Heater Cycling	16.08%	50%	5%	10	564	M	5%	18.32
			Condensing Heat Exchanger	0.00%	5%	8%	10	0	M	5%	5.92
			Improved Gas Drying and Heating Technologies	0.00%	10%	13%	15	0	L	1%	2.67
			Burner Upgrades	0.00%	5%	4%	10	0	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	0.00%	70%	50%	15	0	L	1%	3.97
			Insulating Blankets	0.00%	80%	1%	10	0	M	5%	17.50
			Install Automatic Stack Dampers	0.00%	20%	5%	15	0	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.03)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Transport Equipment	Retrofit	Process Heating (C	Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	32.15%	25%	4%	10	1127	M	5%	17.90
			Reduced Temperature Setpoints	32.15%	70%	19%	1	1127	L	1%	22.59
			Timers	32.15%	70%	1%	10	1127	M	5%	18.32
			Waste Heat Recovery	16.08%	80%	26%	15	564	L	1%	1.79
			Process Heat Recovery	16.08%	80%	25%	15	564	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	0.00%	50%	30%	10	0	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	3.86%	33%	8%	15	10	L	4%	0.47
			HE Boilers (>300kBTU)	2.57%	49%	19%	20	5	O	15%	3.65
			HE Furnaces (>300kBTU)	2.89%	20%	10%	20	6	O	12%	2.39
			HE Unit Heaters	4.82%	10%	34%	15	13	M	13%	11.90
			Infrared Heater	4.82%	5%	12%	15	13	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	21.08%	49%	19%	20	44	O	15%	3.65
Wood Products	NC	HVAC - Heating	HE (ES) Building Design	13.23%	2%	1%	15	3	L	1%	0.32
			HE (ES) Windows and Skylights	6.61%	5%	1%	15	2	L	1%	0.11
			HE HVAC System Design	13.23%	10%	30%	15	3	M	5%	1.90
			HVAC System Commissioning	1.32%	0%	10%	5	0	L	1%	1.32
			Radiant floor heating	1.32%	50%	12%	30	0	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	6.61%	5%	2%	15	166	L	1%	1.27
			Improved Below-Grade Insulation	6.61%	5%	1%	15	166	L	1%	0.32
			Improved Roof/Ceiling Insulation	6.61%	5%	1%	15	166	L	1%	0.32
			Improved Wall Insulation	6.61%	1%	1%	15	166	L	1%	0.16
			Destratification Fans	1.32%	10%	10%	15	67	M	5%	34.56
			Improve Duct Sealing	13.23%	15%	7%	10	333	M	5%	5.79
			Insulate Pipes/Lines	13.23%	80%	1%	10	333	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	1.32%	50%	1%	5	33	M	5%	67.94
			Energy Management System	1.32%	10%	10%	10	33	M	5%	1.18
			HVAC System By-pass Timer	1.32%	10%	1%	10	33	L	1%	48.62
			Thermostat Calibration	1.32%	10%	2%	5	33	M	5%	92.00
			Ventilation Controls Installed	4.23%	5%	15%	15	106	M	5%	1.32
			Boiler - Automatic Chemical feed	1.06%	70%	1%	15	27	M	5%	70.58
			Boiler - Flue gas heat recovery	1.32%	70%	2%	15	33	M	5%	12.83
			Boiler - Install Damper Controls	1.06%	70%	5%	15	27	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	1.06%	65%	8%	15	27	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	1.06%	20%	15%	15	27	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	1.06%	40%	25%	15	27	M	5%	6.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Wood Products	Retrofit	HVAC - Heating	Boiler O2 Trim Controls	1.06%	30%	2%	10	27	O	6%	10.10
			Heat Recovery for Space Heating	0.60%	0%	1%	20	299	M	5%	9.49
			Gas IR Radiant Heating	1.98%	10%	19%	15	50	M	5%	0.49
			Micro Channel Heat Exchangers	4.50%	5%	5%	15	113	M	5%	4.44
			Exhaust Hood Makeup Air	5.03%	15%	5%	15	126	M	5%	1.33
			Solar ventilation pre-heat	0.53%	50%	15%	15	13	L	1%	3.48
			Increase Use of Zoning	13.23%	20%	15%	20	333	M	5%	0.29
			Boiler Controls / Cx and RCx	1.32%	20%	15%	15	33	M	5%	26.14
			Boiler Tune-Up	1.32%	25%	2%	2	33	M	5%	28.74
			HVAC System Retrocommissioning	1.32%	0%	10%	5	33	L	1%	0.66
			HVAC System Tune-up/Maintenance	1.32%	20%	10%	5	33	M	5%	26.76
			Programmable Thermostat (incl minimum set-po	1.32%	50%	4%	10	33	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	22.68%	70%	1%	10	570	M	5%	78.76
			Boiler - Install Damper Controls	22.68%	20%	5%	15	570	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	2.21%	20%	1%	15	713	M	5%	2.79
			Boiler Tune-Up	28.34%	25%	6%	2	713	M	5%	15.47
			Heat Trap	5.67%	80%	5%	5	143	M	5%	62.51
			Insulate piping, valves, fittings, vessels	11.34%	37%	1%	10	713	M	5%	5.79
			Improved Condensate Recovery	6.86%	50%	2%	10	713	H	8%	3.58
			Steam leak repair	4.45%	50%	1%	2	713	M	5%	63.22
			Steam Trap Maintenance	28.34%	35%	3%	2	713	O	6%	18.59
			Blowdown Heat Recovery	3.40%	70%	1%	15	713	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	0.96%	70%	2%	15	713	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	8.50%	30%	2%	10	713	O	6%	10.10
			Burner Upgrades, Repair and Replacement	2.83%	5%	2%	10	713	M	5%	3.27
			Heat Recovery for Hot Water Use	8.50%	50%	30%	15	214	L	1%	12.83
			Solar Water Heater	0.28%	5%	60%	15	713	L	1%	0.15
			Install Feedwater Economizers	3.68%	5%	2%	15	713	M	5%	6.21
			Improve Water Treatment	21.54%	5%	1%	15	713	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	1.81%	5%	1%	2	713	M	5%	14.28
			Improve Blowdown Practices	3.97%	5%	1%	15	713	M	5%	16.41
			Add/Restore Boiler Refractory	1.05%	5%	1%	15	713	L	1%	11.22
			Establish the Correct Vent Rate for Dearator	2.44%	5%	1%	15	713	M	5%	42.01
			Reduce Steam System Generating Pressure	2.52%	5%	1%	15	713	M	5%	71.29
			Other Steam System Improvements and Contro	4.25%	5%	3%	15	713	M	5%	10.46
		Process Heating (G	Improved Sensors and Process Controls	51.02%	70%	8%	8	1283	M	5%	10.84
			Water Heater Cycling	25.51%	50%	5%	10	641	M	5%	18.32
			Condensing Heat Exchanger	2.55%	5%	8%	10	64	M	5%	5.92
			Improved Gas Drying and Heating Technologies	12.76%	10%	13%	15	321	L	1%	2.67
			Burner Upgrades	12.76%	5%	4%	10	321	M	5%	23.87

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Wood Products	Retrofit	Process Heating (G	Emissions Control Improvements (RTO, RCO, F	12.76%	70%	50%	15	321	L	1%	3.97
			Insulating Blankets	12.76%	80%	1%	10	321	M	5%	17.50
			Install Automatic Stack Dampers	10.20%	20%	5%	15	257	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.05)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	51.02%	25%	4%	10	1283	M	5%	17.90
			Reduced Temperature Setpoints	51.02%	70%	19%	1	1283	L	1%	22.59
			Timers	51.02%	70%	1%	10	1283	M	5%	18.32
			Waste Heat Recovery	25.51%	80%	26%	15	641	L	1%	1.79
			Process Heat Recovery	25.51%	80%	25%	15	641	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	6.38%	50%	30%	10	160	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	1.59%	33%	8%	15	3	L	4%	0.47
			HE Boilers (>300kBTU)	1.06%	49%	19%	20	2	O	15%	3.65
			HE Furnaces (>300kBTU)	1.19%	20%	10%	20	2	O	12%	2.39
			HE Unit Heaters	1.98%	10%	34%	15	4	M	13%	11.90
			Infrared Heater	1.98%	5%	12%	15	4	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	22.68%	49%	19%	20	34	O	15%	3.65
WWTF	NC	HVAC - Heating	HE (ES) Building Design	7.61%	2%	1%	15	3	L	1%	0.32
			HE (ES) Windows and Skylights	3.80%	5%	1%	15	2	L	1%	0.11
			HE HVAC System Design	7.61%	10%	30%	15	3	M	5%	1.90
			HVAC System Commissioning	0.76%	0%	10%	5	0	L	1%	1.32
			Radiant floor heating	0.76%	50%	12%	30	0	M	5%	16.24
	Retrofit	HVAC - Heating	Air Sealing	3.80%	5%	2%	15	151	L	1%	1.27
			Improved Below-Grade Insulation	3.80%	5%	1%	15	151	L	1%	0.32
			Improved Roof/Ceiling Insulation	3.80%	5%	1%	15	151	L	1%	0.32
			Improved Wall Insulation	3.80%	1%	1%	15	151	L	1%	0.16
			Destratification Fans	0.76%	10%	10%	15	60	M	5%	34.56
			Improve Duct Sealing	7.61%	15%	7%	10	302	M	5%	5.79
			Insulate Pipes/Lines	7.61%	80%	1%	10	302	M	5%	5.79
			Building Scheduling - Adjust occupied/unoccupi	0.76%	50%	1%	5	30	M	5%	67.94
			Energy Management System	0.76%	10%	10%	10	30	M	5%	1.18
			HVAC System By-pass Timer	0.76%	10%	1%	10	30	L	1%	48.62

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
WWTF	Retrofit	HVAC - Heating	Thermostat Calibration	0.76%	10%	2%	5	30	M	5%	92.00
			Ventilation Controls Installed	2.43%	5%	15%	15	97	M	5%	1.32
			Boiler - Automatic Chemical feed	0.61%	70%	1%	15	24	M	5%	70.58
			Boiler - Flue gas heat recovery	0.76%	70%	2%	15	30	M	5%	12.83
			Boiler - Install Damper Controls	0.61%	70%	5%	15	24	O	6%	5.23
			Boiler - Insulate Boiler Expansion or Condensat	0.61%	65%	8%	15	24	M	5%	5.93
			Boiler - Steam System Isolation (Isolate from ar	0.61%	20%	15%	15	24	M	5%	2.79
			Boiler - Steam to Hot Water Conversion	0.61%	40%	25%	15	24	M	5%	6.85
			Boiler O2 Trim Controls	0.61%	30%	2%	10	24	O	6%	10.10
			Heat Recovery for Space Heating	0.34%	0%	1%	20	272	M	5%	9.49
			Gas IR Radiant Heating	1.14%	10%	19%	15	45	M	5%	0.49
			Micro Channel Heat Exchangers	2.59%	5%	5%	15	103	M	5%	4.44
			Exhaust Hood Makeup Air	2.89%	15%	5%	15	115	M	5%	1.33
			Solar ventilation pre-heat	0.30%	50%	15%	15	12	L	1%	3.48
			Increase Use of Zoning	7.61%	20%	50%	20	302	M	5%	0.95
			Boiler Controls / Cx and RCx	0.76%	20%	15%	15	30	M	5%	26.14
			Boiler Tune-Up	0.76%	25%	2%	2	30	M	5%	28.74
			HVAC System Retrocommissioning	0.76%	0%	10%	5	30	L	1%	0.66
			HVAC System Tune-up/Maintenance	0.76%	20%	10%	5	30	M	5%	26.76
			Programmable Thermostat (incl minimum set-po	0.76%	50%	4%	10	30	M	5%	48.62
		Steam Production	Boiler - Automatic Chemical feed	31.55%	70%	1%	10	1254	M	5%	78.76
			Boiler - Install Damper Controls	31.55%	20%	5%	15	1254	O	6%	5.23
			Boiler - Steam System Isolation (Isolate from ar	3.08%	20%	1%	15	1567	M	5%	2.79
			Boiler Tune-Up	39.43%	25%	6%	2	1567	M	5%	15.47
			Heat Trap	7.89%	80%	5%	5	313	M	5%	62.51
			Insulate piping, valves, fittings, vessels	15.77%	37%	1%	10	1567	M	5%	5.79
			Improved Condensate Recovery	9.54%	50%	2%	10	1567	H	8%	3.58
			Steam leak repair	6.19%	50%	1%	2	1567	M	5%	63.22
			Steam Trap Maintenance	39.43%	35%	3%	2	1567	O	6%	18.59
			Blowdown Heat Recovery	4.73%	70%	1%	15	1567	M	5%	14.12
			Cumbustion Air Preheater (Flue Recovery)	1.34%	70%	2%	15	1567	M	5%	12.83
			Boiler O2 Trim Controls and Optimizing Excess	11.83%	30%	2%	10	1567	O	6%	10.10
			Burner Upgrades, Repair and Replacement	3.94%	5%	2%	10	1567	M	5%	3.27
			Heat Recovery for Hot Water Use	11.83%	50%	30%	15	470	L	1%	12.83
			Solar Water Heater	0.39%	5%	60%	15	1567	L	1%	0.15
			Install Feedwater Economizers	5.13%	5%	2%	15	1567	M	5%	6.21
			Improve Water Treatment	29.97%	5%	1%	15	1567	L	1%	3.48
			Clean Boiler Heat Transfer Surfaces	2.52%	5%	1%	2	1567	M	5%	14.28
			Improve Blowdown Practices	5.52%	5%	1%	15	1567	M	5%	16.41
			Add/Restore Boiler Refractory	1.46%	5%	1%	15	1567	L	1%	11.22

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (BBTU)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
WWTF	Retrofit	Steam Production	Establish the Correct Vent Rate for Dearator	3.39%	5%	1%	15	1567	M	5%	42.01
			Reduce Steam System Generating Pressure	3.51%	5%	1%	15	1567	M	5%	71.29
			Other Steam System Improvements and Contro	5.92%	5%	3%	15	1567	M	5%	10.46
		Process Heating (O	Improved Sensors and Process Controls	50.02%	70%	8%	8	1988	M	5%	10.84
			Water Heater Cycling	25.01%	50%	5%	10	994	M	5%	18.32
			Condensing Heat Exchanger	0.00%	5%	8%	10	0	M	5%	5.92
			Improved Gas Drying and Heating Technologies	0.00%	10%	13%	15	0	L	1%	2.67
			Burner Upgrades	0.00%	5%	4%	10	0	M	5%	23.87
			Emissions Control Improvements (RTO, RCO, F	0.00%	70%	50%	15	0	L	1%	3.97
			Insulating Blankets	0.00%	80%	1%	10	0	M	5%	17.50
			Install Automatic Stack Dampers	0.00%	20%	5%	15	0	M	5%	21.39
			Electric Preheat	0.00%	10%	10%	8	0	M	5%	(0.06)
			Electric Melting - Fuel Switch	0.00%	0%	100%	10	0	M	5%	(0.03)
			Install Stack Melting Furnace	0.00%	0%	50%	20	0	M	5%	11.77
			Insulation - Refractory Fibers	0.00%	30%	5%	15	0	M	5%	5.23
			Preheat combustion air	0.00%	50%	12%	15	0	M	5%	12.83
			Radiant tube inserts installed in exhaust of radia	0.00%	10%	11%	5	0	L	1%	6.09
			Recuperator	0.00%	50%	30%	10	0	L	1%	17.50
			Recuperative Burners Installed	0.00%	50%	5%	10	0	L	1%	1.57
			Regenerator	0.00%	30%	5%	10	0	L	1%	4.55
			Load Management	50.02%	25%	4%	10	1988	M	5%	17.90
			Reduced Temperature Setpoints	50.02%	70%	19%	1	1988	L	1%	22.59
			Timers	50.02%	70%	1%	10	1988	M	5%	18.32
			Waste Heat Recovery	25.01%	80%	26%	15	994	L	1%	1.79
			Process Heat Recovery	25.01%	80%	25%	15	994	M	5%	0.36
			Repair Leaks, Insulation and Seals (Drying and	0.00%	50%	30%	10	0	M	5%	17.50
			Repair Leaks, Insulation and Seals (Metal Casti	0.00%	50%	30%	10	0	M	5%	17.50
	ROB	HVAC - Heating	HE Heat Pumps, including geothermal	0.91%	33%	8%	15	3	L	4%	0.47
			HE Boilers (>300kBTU)	0.61%	49%	19%	20	1	O	15%	3.65
			HE Furnaces (>300kBTU)	0.68%	20%	10%	20	2	O	12%	2.39
			HE Unit Heaters	1.14%	10%	34%	15	3	M	13%	11.90
			Infrared Heater	1.14%	5%	12%	15	3	M	13%	0.49
		Steam Production	HE Boilers (>300kBTU)	31.55%	49%	19%	20	75	O	15%	3.65

Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (GWh)	Delphi Input (O, H, M, L)	Annual Impact of Aggressive Programs in 20120 (%)	Load Reduction Factor (kW/kWh)	TRC Ratio
Retrofit	Dairy/Livestock O	Automatic Belt Tensioning on Ventilation Fans	1.3%	1%	5%	15	26.3	L	1%	0.00011416	0.03
		Free stall or barn lighting retrofit	3.3%	15%	22%	5	100.1	O	5%	0.00011416	1.61
		High efficiency milkhouse compressors (include scroll com	13.1%	40%	20%	15	273.0	O	4%	0.00011416	6.24
		High Volume, Low Speed Ventilation Fans	3.3%	25%	10%	15	65.7	O	8%	0.00011416	1.52
		Increased Maintenance of Shutters on Ventilation Fans	6.7%	20%	10%	15	131.4	L	1%	0.00011416	2.32
		Milkhouse heat recovery tank	9.8%	55%	59%	15	273.0	O	4%	0.00011416	2.82
		Milkhouse or mechanical house lighting retrofit	1.1%	35%	75%	5	33.4	O	5%	0.00011416	9.90
		Milkhouse plate cooler	13.1%	60%	42%	15	273.0	O	4%	0.00011416	1.54
		Milkhouse VFD for manure pumps	1.5%	1%	80%	15	24.3	L	1%	0.00011416	0.98
		Milkhouse water heater conversion to gas	3.2%	2%	41%	10	262.9	L	1%	0.00011416	1.70
		Parlor lighting retrofit	2.6%	35%	43%	6	77.9	O	5%	0.00011416	1.28
		Pole shed or equipment storage facility retrofit	0.4%	10%	75%	5	11.1	O	3%	0.00011416	5.33
		Resize Vacuum Pump	8.9%	30%	10%	15	182.0	M	5%	0.00011416	2.25
		Variable speed milk and vacuum pumps	8.9%	30%	25%	15	182.0	O	9%	0.00011416	2.93
	Irrigation Systems	Irrigation Testing (uniformity testing and periodic well testin	9.0%	5%	3%	3	182.0	L	1%	0.00011416	0.16
		Low Pressure Sprinkler Nozzles	9.0%	0%	18%	20	182.0	L	1%	0.00011416	1.07
		Pump Repair: impeller & bowls	9.0%	40%	1%	10	182.0	L	1%	0.00011416	0.60
		Tape drip irrigation	9.0%	1%	26%	5	182.0	L	1%	0.00011416	0.06
	Produce Storage	Installation of VSDs on Ventilation Fans	4.0%	0%	10%	15	80.9	O	4%	0.00011416	0.35

Market	End Use	Measure	Base Saturation (% of Segment Energy)	EE Saturation (%)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Base Annual Market Size Applicable to Measure (bBTU)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs in 2012 (%)	TRC Ratio
NC	Grain Drying Operations	Concurrent-Flow Dryers (40% improvement over Cross-Flow Dryers)	30%	10%	20%	15	6	L	1%	1.53
		Counter-Flow Dryers (40% improvement over Cross-Flow Dryers)	30%	10%	20%	15	6	L	1%	1.41
		Mixed-Flow Dryers (40% improvement over Cross-Flow Dryers)	30%	10%	20%	15	6	L	1%	1.26
	Greenhouses	Double Poly over Single Poly Exterior Walls (50% heat savings)	10%	50%	53%	4	2	M	5%	15.71
		Poly over Glass Exterior Insulation	10%	90%	15%	15	2	M	5%	2.18
Retrofit	Dairy/Livestock Operation	Milkhouse boiler system replacement	60%	1%	40%	15	1140	L	1%	0.38
	Grain Drying Operations	Heat Recovery on Continuous Flow Dryers (10-15% savings)	30%	25%	20%	15	570	M	5%	0.62
		In-bin cooling over In-dryer cooling and Dryeration	30%	25%	20%	15	570	M	5%	0.77
		In-Bin Natural or Low Heat Drying	30%	30%	20%	15	570	M	5%	1.68
	Greenhouses	Greenhouse boiler power vent	10%	10%	17%	10	190	M	5%	6.80
		Greenhouse boiler system replacement	10%	3%	18%	20	190	M	5%	0.27
		Greenhouse Climate Controls	10%	5%	6%	10	190	M	5%	0.22
		Greenhouse Glazing	10%	15%	19%	15	190	M	5%	0.47
		Greenhouse Heat Curtain	10%	10%	55%	15	190	M	5%	5.63
		Greenhouse Heating System - Radiant (Possibly floor) over Heated Air	10%	3%	58%	25	190	M	5%	2.12
		Greenhouse Infiltration Reduction	10%	5%	9%	15	190	M	5%	0.08
		Greenhouse Perimeter Insulation	10%	33%	6%	15	190	M	5%	0.13

APPENDIX C

BASELINE ENERGY CONSUMPTION: MARKET SEGMENTATION

The following tables contain the baseline energy consumption data used in the energy efficiency potential study, segmented by market and end use. Sector data are based on 2006 energy consumption data published in the 2007 edition of *Wisconsin Energy Statistics*.[1] Propane consumption has been added to the natural gas consumption total for each sector.

Please note that in instances where the Energy Center reports energy efficiency potential as a percentage of total sales (electricity or natural gas), the basis for total sales is estimated future energy consumption, rather than the 2006 sales values presented in Appendix C. The average energy consumption growth rate for Wisconsin was obtained using three years of weather-adjusted data published in *Wisconsin Energy Statistics*, and future sales were projected by using this growth rate to inflate 2007 energy consumption data, as reported in the *2008 Wisconsin Energy Statistics.*[2]

TABLE C-1: RESIDENTIAL MARKET SEGMENTATION – ELECTRICITY USE[3 4 5]

Residential Electricity End Use (GWh)	Mobile Home	Multifamily Rental - 5+ Units	Multifamily Rental - 1-4 Units	Single Family Owner-Occupied
In Unit Lighting	119	237	621	2,601
Domestic Water Heating	185	164	378	1,517
Washer/Dryer	41	98	255	1,069
Air Conditioning	48	195	268	1,042
Range/Oven	23	106	224	939
Electronics	55	149	231	904
Primary Refrigerator	45	135	237	863
Dehumidification	9	5	7	555
Primary Freezer	16	11	36	409
Secondary Refrigerator	7	10	12	311
Ceiling Fans	11	6	13	269
Space Heating	32	165	184	217
Secondary Freezer	1	-	4	56
Other	288	864	981	3,697
Total	**881**	**2,144**	**3,452**	**14,448**

[1] Wisconsin Office of Energy Independence (2007). *2007 Wisconsin Energy Statistics*. Available at: http://power.wisconsin.gov/docview.asp?docid=11632&locid=131.
[2] Wisconsin Office of Energy Independence (2008). *2008 Wisconsin Energy Statistics*. Available at: http://power.wisconsin.gov/section.asp?linkid=1495&locid=131.
[3] Wisconsin Office of Energy Independence (2006). *2006 Wisconsin Energy Statistics*. Available at: http://www.doa.state.wi.us/docs_view2.asp?docid=4398.
[4] Energy Center of Wisconsin (2000). *Energy and Housing in Wisconsin: A Study of Single-Family Owner-Occupied Homes*. Report No. 199-1. Available at: http://www.ecw.org/resource_detail.php?resultid=293.
[5] Energy Center of Wisconsin (2005). *Energy and Rental Housing: A Wisconsin Characterization Study*. Report No. 232-1. Available at: http://www.ecw.org/resource_detail.php?resultid=295.

TABLE C-2: RESIDENTIAL MARKET SEGMENTATION – NATURAL GAS USE[6] [7] [8]

Residential Natural Gas End Use (1,000 therms)	Mobile Home	Multifamily Rental - 5+ Units	Multifamily Rental - 1-4 Units	Single Family Owner-Occupied
Forced Air Heating	55,503	18,799	282,486	849,542
Hydronic Heating	-	62,662	16,617	115,584
Water Heating	7,929	36,476	66,697	227,556
Total	**63,432**	**117,936**	**365,800**	**1,192,682**

[6] Wisconsin Office of Energy Independence (2006). *2006 Wisconsin Energy Statistics*. Available at: http://www.doa.state.wi.us/docs_view2.asp?docid=4398.
[7] Energy Center of Wisconsin (2000). *Energy and Housing in Wisconsin: A Study of Single-Family Owner-Occupied Homes*. Report No. 199-1. Available at: http://www.ecw.org/resource_detail.php?resultid=293.
[8] Energy Center of Wisconsin (2005). *Energy and Rental Housing: A Wisconsin Characterization Study*. Report No. 232-1. Available at: http://www.ecw.org/resource_detail.php?resultid=295.

TABLE C-3: COMMERCIAL MARKET SEGMENTATION – ELECTRICITY USE

Commercial Electricity End Use (GWh)	Education	Food Sales	Food Service	Health Care	Lodging	Mercan-tile	Office	Public Assembly	Public Order & Safety	Religious Worship	Service	Ware-house & Storage	Other (incl. Labs)
Appliance, Data & Office Equipment	82	14	14	182	96	59	1,309	46	46	18	137	50	273
Cooking/ Kitchen Appliances	10	8	36	11	10	30	-	55	5	2	14	10	46
HVAC	543	157	212	401	478	858	1,205	302	91	121	342	313	100
Lighting (Commercial, Industrial & Agricultural Applications)	963	342	355	783	606	1,421	2,200	421	219	187	656	526	128
Refrigeration	41	615	437	55	48	266	52	23	-	9	109	1,453	146
Water Heating	111	123	191	98	115	133	94	61	-	25	61	25	27
Pool	12	-	-	11	13	-	10	7	-	-	-	5	4
Other	287	108	122	281	230	192	367	224	96	94	48	123	188
Total	**2,049**	**1,366**	**1,366**	**1,822**	**1,594**	**2,960**	**5,237**	**1,139**	**455**	**455**	**1,366**	**2,505**	**911**

TABLE C-4: COMMERCIAL MARKET SEGMENTATION – NATURAL GAS USE

Commercial Natural Gas End Use (1,000 therms)	Education	Food Sales	Food Service	Health Care	Lodging	Mercan-tile	Office	Public Assembly	Public Order & Safety	Religious Worship	Service	Ware-house & Storage	Other (incl. Labs)
Cooking/ Kitchen Appliances	17,063	2,975	19,425	11,813	7,438	15,750	-	6,825	1,750	3,938	10,500	1,575	7,000
HVAC	81,375	9,800	18,375	35,438	52,500	66,150	90,650	32,025	4,375	28,000	33,600	39,900	16,800
Water Heating	28,350	3,938	12,758	26,224	24,500	22,050	29,400	12,075	2,363	10,938	18,270	8,400	9,135
Pool	3,150	-	-	2,914	2,625	-	-	1,260	88	438	700	-	350
Other	1,313	787	1,943	2,362	438	1,050	2,450	315	175	438	6,930	2,625	1,715
Total	**131,250**	**17,500**	**52,500**	**78,750**	**87,500**	**105,000**	**122,500**	**52,500**	**8,750**	**43,750**	**70,000**	**52,500**	**35,000**

TABLE C-5: INDUSTRIAL MARKET SEGMENTATION – ELECTRICITY USE

Industrial Electricity End Use (GWh)	Pulp & Paper	Food	Chemicals	Wood Products	Machinery	Fabricated Metals	Metals (primary)	Plastic & Rubber	Trans-port Equip-ment	Beverage & Tobacco	Waste-water Treat-ment	Other
Air Compression	32	32	-	-	56	39	19	31	33	3	244	48
HVAC - Cooling	125	146	96	47	277	145	68	84	124	11	-	181
HVAC - Heating	194	110	60	29	137	72	39	45	63	7	-	99
Lighting	177	208	106	75	308	202	80	103	145	13	20	203
Motors	3,673	1,573	1,417	759	1,091	949	887	684	421	61	196	1,684
Other	164	202	474	84	135	174	873	19	30	8	29	404
Process Cooling	68	785	207	6	74	75	22	105	44	42	-	207
Process Heating	114	95	81	55	166	493	776	196	93	3	-	343
Total	**4,546**	**3,150**	**2,441**	**1,056**	**2,244**	**2,149**	**2,765**	**1,267**	**953**	**147**	**489**	**3,168**

TABLE C-6: INDUSTRIAL MARKET SEGMENTATION – NATURAL GAS USE

Industrial Natural Gas End Use (1,000 therms)	Pulp & Paper	Food	Chemicals	Wood Products	Machinery	Fabricated Metals	Metals (primary)	Plastic & Rubber	Trans-port Equip-ment	Beverage & Tobacco	Waste-water Treat-ment	Other
Steam Production	200,086	120,600	140,811	7,125	9,555	-	12,742	11,827	9,239	5,600	15,673	57,989
Process Heating	84,600	89,550	89,352	12,825	19,793	55,341	95,286	8,870	11,271	1,307	19,879	73,554
HVAC - Heating	12,757	16,200	4,990	3,325	19,793	18,447	7,940	5,914	11,271	747	3,023	11,185
Other	30,214	25,290	19,804	3,287	5,324	15,654	5,274	4,189	4,569	756	3,425	12,672
Total	**327,657**	**251,640**	**254,956**	**26,562**	**54,464**	**89,442**	**121,242**	**30,800**	**36,350**	**8,409**	**42,000**	**155,400**

APPENDIX D

DETAILED RESULTS

In the following tables negative savings values are the result of measure interaction, where an energy efficiency measure associated with primary electricity or natural gas savings produces a corresponding increase in consumption of the other fuel.

Segment	Residential Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achiev. Potential (GWh)	2018 Achiev. Potential (GWh)	Economic Potential (1,000 therms)	2012 Achiev. Potential (1,000 therms)	2018 Achiev. Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Single Family	CFL Bulbs, purchased replac	246.55	61.64	0.00	(5,968)	(1,485)	0	4.569	0.000	$6,520	$17,762
	Wx - Direct Install	1061.93	26.01	60.68	109,371	2,427	5,664	3.563	8.313	$70,807	$76,677
	Whole-house Electricity-Use	464.86	23.48	14.09	(6,060)	(289)	(173)	3.216	1.930	$10,330	$10,658
	ECM Furnace	52.96	15.58	18.69	0	0	0	5.991	7.189	$11,553	$14,967
	Low Flow Showerhead	95.57	5.31	3.19	0	0	0	1.062	0.637	$664	$3,149
	Dryer Fuel Switch	79.83	3.19	4.79	(3,193)	(128)	(192)	0.875	1.312	$671	$1,246
	Second Refrigerator Turn In	310.86	3.11	3.11	(6,529)	(64)	(64)	0.213	0.213	$548	$775
	Exterior Lighting Controls	121.91	3.05	1.52	0	0	0	0.000	0.000	$860	$1,979
	Home Electronics Efficiency U	20.72	3.05	4.39	(497)	(73)	(105)	0.417	0.601	$244	$1,108
	Water Heater Blanket	34.62	2.80	1.67	0	0	0	0.560	0.335	$1,340	$1,803
	Shower Controls (Shower Sta	45.53	2.80	1.68	0	0	0	0.560	0.336	$1,239	$1,802
	Pipe Wrap	35.47	2.64	1.58	0	0	0	0.528	0.316	$1,136	$1,702
	Heat Pump Water Heater	42.06	2.31	6.94	0	0	0	0.463	1.387	$1,257	$2,406
	Range/Oven Fuel Switch	57.60	2.30	3.46	(1,728)	(69)	(104)	0.631	0.947	$634	$1,297
	Second Freezer Turn In	55.91	2.10	0.56	(1,140)	(41)	(11)	0.144	0.038	$453	$533
	Energy Star Clothes Washer (	16.25	1.96	3.92	0	0	0	0.392	0.783	$749	$1,617
	Efficient Electric Water Heate	5.68	1.59	2.31	0	0	0	0.319	0.462	$573	$1,249
	Energy Star Dehumidifer	10.18	0.45	0.68	0	0	0	0.226	0.339	$141	$368
	New Construction, Improved F	0.00	0.38	0.54	0	0	0	0.075	0.108	$415	$571
	Energy Star Compliant Persoı	5.22	0.28	0.42	(120)	(6)	(10)	0.038	0.057	$42	$92
	Setback Thermostats	3.84	0.11	0.06	10,314	246	123	0.375	0.188	$1,429	$2,011
	Energy Star Dishwasher (Elec	1.87	0.10	0.14	0	0	0	0.019	0.029	$18	$71
	Room A/C Turn In	6.11	0.08	0.04	0	0	0	0.255	0.127	$12	$98
	Energy Star Clothes Washer (	0.32	0.04	0.08	39	1	2	0.008	0.017	$26	$44
	New Construction	0.00	0.00	0.01	0	9	15	0.013	0.020	$127	$180
	Low Flow Showerhead (w/ Ga	0.00	0.00	0.00	8,400	857	514	0.000	0.000	$1,370	$6,214
	High Efficiency Boiler w/ indire	0.00	0.00	0.00	1,140	137	197	0.000	0.000	$1,519	$1,737
	Energy Star Clothes Washer (	0.00	0.00	0.00	677	91	181	0.000	0.000	$739	$768
	High Efficiency Furnace - Nat	0.00	0.00	0.00	1,505	61	61	0.000	0.000	$353	$779
	Improved Plumbing Layout - C	0.00	0.00	0.00	0	85	124	0.000	0.000	$1,435	$1,589
	Energy Star Dishwasher (w/G	0.00	0.00	0.00	523	34	51	0.000	0.000	$87	$286
	LED Bulbs, purchased replac	144.61	0.00	29.21	(3,500)	0	(704)	0.000	2.165	$0	$0
Single Family Total		2920.47	164.35	163.75	103,235	1,794	5,569	24.510	27.850	$117,291	$155,541

Segment	Residential Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achiev. Potential (GWh)	2018 Achiev. Potential (GWh)	Economic Potential (1,000 therms)	2012 Achiev. Potential (1,000 therms)	2018 Achiev. Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Rental 1-4	CFL Bulbs, purchased replac	41.73	9.82	0.00	(921)	(237)	0	0.728	0.000	$1,039	$2,829
	Wx - Direct Install	247.40	6.06	14.14	32,883	730	1,704	0.830	1.937	$19,003	$20,746
	ECM Furnace	20.12	2.65	3.18	0	0	0	1.018	1.222	$1,963	$2,543
	Low Flow Showerhead	24.47	0.68	0.41	0	0	0	0.136	0.082	$75	$403
	Dryer Fuel Switch	19.07	0.38	0.57	(763)	(15)	(23)	0.105	0.157	$99	$149
	Second Refrigerator Turn In	11.52	0.12	0.12	(220)	(2)	(2)	0.008	0.008	$23	$29
	Exterior Lighting Controls	46.95	0.35	0.17	0	0	0	0.000	0.000	$55	$224
	Home Electronics Efficiency U	4.95	0.36	0.52	(106)	(8)	(11)	0.050	0.072	$34	$139
	Water Heater Blanket	9.45	0.36	0.22	0	0	0	0.072	0.043	$125	$233
	Shower Controls (Shower Sta	11.88	0.36	0.22	0	0	0	0.072	0.043	$166	$232
	Pipe Wrap	7.80	0.34	0.20	0	0	0	0.068	0.041	$152	$218
	Heat Pump Water Heater	11.52	0.30	0.89	0	0	0	0.059	0.178	$122	$309
	Range/Oven Fuel Switch	13.76	0.28	0.41	(551)	(11)	(17)	0.075	0.113	$94	$126
	Second Freezer Turn In	3.51	0.13	0.04	(66)	(3)	(1)	0.009	0.002	$29	$33
	Energy Star Clothes Washer (	3.20	0.41	0.82	0	0	0	0.083	0.165	$158	$341
	Efficient Electric Water Heate	1.43	0.20	0.29	0	0	0	0.040	0.058	$54	$156
	Energy Star Dehumidifer	0.08	0.00	0.00	0	0	0	0.001	0.001	$1	$1
	New Construction, Improved F	0.00	0.04	0.06	0	0	0	0.009	0.013	$54	$67
	Energy Star Compliant Perso	1.66	0.04	0.07	(35)	(1)	(2)	0.006	0.009	$7	$15
	Setback Thermostats	1.65	0.02	0.01	5,251	57	29	0.073	0.037	$260	$464
	Energy Star Dishwasher (Elec	1.08	0.03	0.04	0	0	0	0.006	0.008	$5	$21
	Room A/C Turn In	23.59	0.15	0.07	0	0	0	0.492	0.246	$28	$188
	Energy Star Clothes Washer (	0.14	0.02	0.04	41	0	1	0.004	0.008	$13	$21
	New Construction	0.00	0.00	0.00	0	0	0	0.000	0.000	$0	$0
	Low Flow Showerhead (w/ Ga	0.00	0.00	0.00	3,097	124	75	0.000	0.000	$182	$902
	High Efficiency Boiler w/ indire	0.00	0.00	0.00	123	9	13	0.000	0.000	$85	$119
	Energy Star Clothes Washer (	0.00	0.00	0.00	34	6	11	0.000	0.000	$47	$48
	High Efficiency Furnace - Nat	0.00	0.00	0.00	1,734	20	20	0.000	0.000	$93	$259
	Energy Star Dishwasher (w/G	0.00	0.00	0.00	171	4	6	0.000	0.000	$11	$35
	LED Bulbs, purchased replac	21.26	0.00	4.30	(471)	0	(103)	0.000	0.318	$0	$0
	Drainwater heat recovery	0.00	0.00	0.00	9,476	379	220	0.000	0.000	$5,489	$6,629
	Boiler Controls-Gas	0.00	0.00	0.00	1,352	46	27	0.000	0.000	$151	$360
	Efficient Steam Boiler (MF) - g	0.00	0.00	0.00	34	2	3	0.000	0.000	$18	$34
	Common Area Lighting Impro	60.76	7.59	3.80	(148)	(20)	(10)	0.520	0.260	$1,986	$3,180
Rental 1-4 Total		588.99	30.69	30.59	50,916	1,082	1,942	4.462	5.020	$31,620	$41,054

Segment	Residential Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achiev. Potential (GWh)	2018 Achiev. Potential (GWh)	Economic Potential (1,000 therms)	2012 Achiev. Potential (1,000 therms)	2018 Achiev. Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Rental 5+	CFL Bulbs, purchased replac	22.42	5.28	0.00	(523)	(127)	0	0.391	0.000	$558	$1,520
	Wx - Direct Install	27.70	2.77	6.46	1,270	113	263	0.379	0.885	$5,435	$5,612
	ECM Furnace	2.70	0.36	0.43	0	0	0	0.137	0.164	$264	$342
	Low Flow Showerhead	17.43	0.49	0.29	0	0	0	0.098	0.059	$67	$290
	Second Refrigerator Turn In	9.67	0.10	0.10	(203)	(2)	(2)	0.007	0.007	$17	$24
	Exterior Lighting Controls	6.18	0.08	0.04	0	0	0	0.000	0.000	$28	$50
	Home Electronics Efficiency U	3.07	0.23	0.33	(73)	(6)	(8)	0.031	0.045	$23	$81
	Water Heater Blanket	9.79	0.26	0.16	0	0	0	0.053	0.032	$26	$169
	Heat Pump Water Heater	7.93	0.22	0.65	0	0	0	0.043	0.129	$110	$224
	Range/Oven Fuel Switch	1.62	0.03	0.05	(40)	(1)	(1)	0.009	0.013	$19	$20
	Second Freezer Turn In	0.00	0.00	0.00	0	0	0	0.000	0.000	$0	$0
	Energy Star Clothes Washer (	1.48	0.16	0.32	0	0	0	0.032	0.063	$36	$130
	Efficient Electric Water Heate	0.59	0.09	0.13	0	0	0	0.017	0.025	$29	$68
	Energy Star Dehumidifer	0.06	0.00	0.00	0	0	0	0.001	0.001	$1	$1
	New Construction, Improved F	0.00	0.04	0.05	0	0	0	0.007	0.010	$17	$55
	Energy Star Compliant Perso	1.19	0.03	0.05	(27)	(1)	(1)	0.004	0.007	$5	$11
	Energy Star Dishwasher (Elec	0.27	0.01	0.01	0	0	0	0.002	0.003	$4	$7
	Room A/C Turn In	3.96	0.02	0.01	0	0	0	0.082	0.041	$3	$32
	Energy Star Clothes Washer (	0.06	0.01	0.02	2	0	0	0.002	0.003	$3	$9
	New Construction	0.00	0.00	0.00	0	0	0	0.000	0.000	$0	$0
	Low Flow Showerhead (w/ Ga	0.00	0.00	0.00	1,702	68	41	0.000	0.000	$123	$496
	Energy Star Clothes Washer (	0.00	0.00	0.00	20	3	6	0.000	0.000	$13	$26
	High Efficiency Furnace - Nat	0.00	0.00	0.00	80	1	1	0.000	0.000	$11	$17
	Energy Star Dishwasher (w/G	0.00	0.00	0.00	122	3	4	0.000	0.000	$8	$25
	LED Bulbs, purchased replac	12.70	0.00	2.56	(305)	0	(62)	0.000	0.190	$0	$0
	Drainwater heat recovery	0.00	0.00	0.00	3,298	152	89	0.000	0.000	$2,186	$2,668
	Boiler Controls-Gas	0.00	0.00	0.00	4,136	172	103	0.000	0.000	$188	$1,357
	Indirect-fired domestic water I	0.00	0.00	0.00	426	27	39	0.000	0.000	$124	$348
	Mainline Air vent (MF) - gas	0.00	0.00	0.00	727	25	15	0.000	0.000	$87	$392
	Energy Star Clothes Washer (	1.53	0.16	0.32	88	11	21	0.044	0.088	$73	$193
	Water heater tank wrap - Gas	0.00	0.00	0.00	32	1	1	0.000	0.000	$6	$7
	Common Area Lighting Impro	15.67	6.27	3.13	(66)	(27)	(13)	0.429	0.215	$1,781	$2,562
Rental 5+ Total		146.04	16.59	15.10	10,666	415	497	1.768	1.980	$11,243	$16,737

Segment	Residential Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achiev. Potential (GWh)	2018 Achiev. Potential (GWh)	Economic Potential (1,000 therms)	2012 Achiev. Potential (1,000 therms)	2018 Achiev. Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Mobile Home	CFL Bulbs, purchased replac	11.98	2.82	0.00	(255)	(68)	0	0.209	0.000	$298	$812
	Wx - Direct Install	43.61	1.19	2.78	5,299	133	311	0.163	0.380	$3,681	$3,900
	ECM Furnace	4.05	1.01	1.22	0	0	0	0.390	0.468	$751	$974
	Low Flow Showerhead	11.86	0.66	0.40	0	0	0	0.132	0.079	$82	$391
	Dryer Fuel Switch	3.06	0.12	0.18	(122)	(5)	(7)	0.034	0.050	$32	$48
	Second Refrigerator Turn In	7.46	0.07	0.07	(125)	(1)	(1)	0.005	0.005	$15	$19
	Exterior Lighting Controls	6.61	0.17	0.08	0	0	0	0.000	0.000	$51	$107
	Home Electronics Efficiency U	1.26	0.19	0.27	(30)	(4)	(6)	0.025	0.037	$15	$68
	Heat Pump Water Heater	5.32	0.29	0.86	0	0	0	0.058	0.173	$156	$299
	Range/Oven Fuel Switch	1.42	0.06	0.09	(57)	(2)	(3)	0.016	0.023	$19	$26
	Second Freezer Turn In	0.68	0.03	0.01	(11)	(0)	(0)	0.002	0.000	$6	$6
	Energy Star Clothes Washer (	1.07	0.13	0.26	0	0	0	0.026	0.051	$49	$106
	Efficient Electric Water Heate	0.68	0.19	0.28	0	0	0	0.039	0.056	$70	$152
	Energy Star Dehumidifer	0.10	0.00	0.01	0	0	0	0.002	0.003	$3	$4
	Energy Star Compliant Persor	0.32	0.02	0.03	(7)	(0)	(1)	0.002	0.003	$3	$6
	Setback Thermostats	0.37	0.01	0.01	956	21	10	0.039	0.020	$99	$172
	Energy Star Dishwasher (Elec	0.22	0.01	0.02	0	0	0	0.002	0.003	$2	$9
	Room A/C Turn In	5.22	0.07	0.03	0	0	0	0.217	0.109	$11	$83
	Energy Star Clothes Washer (	0.01	0.00	0.01	2	0	0	0.001	0.001	$2	$3
	Low Flow Showerhead (w/ Ga	0.00	0.00	0.00	293	30	18	0.000	0.000	$48	$217
	Energy Star Clothes Washer (	0.00	0.00	0.00	53	7	14	0.000	0.000	$56	$58
	High Efficiency Furnace - Nat	0.00	0.00	0.00	331	4	4	0.000	0.000	$27	$51
	Energy Star Dishwasher (w/G	0.00	0.00	0.00	9	1	1	0.000	0.000	$2	$5
	LED Bulbs, purchased replac	6.78	0.00	1.37	(147)	0	(33)	0.000	0.102	$0	$0
	Duct Sealing (Outside Condit	3.68	0.06	0.03	7,533	104	52	0.196	0.098	$320	$1,154
	Indirect-fired domestic water I	0.00	0.00	0.00	96	12	17	0.000	0.000	$66	$152
Mobile Home Total		115.77	7.09	7.98	13,817	230	375	1.556	1.663	$5,865	$8,820
Grand Total		**3771.27**	**218.71**	**217.42**	**178,634**	**3,521**	**8,383**	**32.296**	**36.513**	**$166,019**	**$222,152**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Education	Lighting controls / design	206.38	20.76	12.03	(3,577)	(323)	(179)	2.250	1.304	$ 1,516	$ 11,178
	HVAC RCx / Controls	105.26	5.94	4.34	13,736	831	599	7.215	5.273	$ 5,382	$ 12,158
	DHW System improvements	41.98	1.49	0.87	8,530	487	499	0.157	0.092	$ 934	$ 4,944
	Lighting equipment	16.23	3.28	1.19	(248)	(29)	(13)	0.356	0.129	$ 388	$ 1,405
	Refrig - RCx / controls	3.22	0.55	0.34	-	-	-	0.025	0.015	$ 93	$ 268
	Refrig - Cooler/Freezer equip	5.52	0.24	0.26	-	-	-	0.011	0.012	$ 56	$ 174
	Cooling Equipment	19.98	2.51	2.02	-	-	-	3.033	2.426	$ 1,090	$ 3,160
	Elec heating	15.37	1.54	0.92	(353)	(60)	(36)	0.000	0.000	$ 473	$ 646
	Shell improvement	0.00	0.50	0.80	-	54	86	0.598	0.967	$ 988	$ 2,675
	Refrig - Displays	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Clotheswashing	1.12	0.02	0.03	1,088	24	26	0.002	0.003	$ 87	$ 254
	Faucets / Nozzles	3.52	0.32	0.19	947	127	70	0.034	0.020	$ 39	$ 697
	Process equip	2.37	0.09	0.07	(14)	(0)	(1)	0.009	0.008	$ 16	$ 37
	Process equip: cooking	0.97	0.01	0.01	-	-	-	0.001	0.001	$ 2	$ 4
	Pool	0.00	0.00	0.00	1,386	33	38	0.000	0.000	$ 24	$ 253
	Dishwashing	0.40	0.00	0.00	1,827	38	54	0.000	0.000	$ 32	$ 302
	Cooking	0.00	0.00	0.00	1,945	90	65	0.000	0.000	$ 174	$ 710
	Gas Heating Equip	0.00	0.00	0.00	3,964	144	176	0.000	0.000	$ 441	$ 1,494
	Heat Recovery	0.00	0.01	0.01	-	14	19	0.008	0.011	$ 30	$ 145
	Data / computing / office equip	7.63	0.81	0.67	(64)	(10)	(9)	0.088	0.072	$ 249	$ 455
Education Total		**429.95**	**38.07**	**23.76**	**29,168**	**1,419**	**1,393**	**13.788**	**10.333**	**$ 12,013**	**$ 40,958**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Food Sales	Lighting controls / design	26.18	1.55	1.16	(401)	(20)	(13)	0.223	0.167	$ 183	$ 880
	HVAC RCx / Controls	23.77	0.90	0.63	9,889	418	296	0.947	0.664	$ 584	$ 1,129
	DHW System improvements	74.23	3.44	3.36	902	40	43	0.507	0.495	$ 2,808	$ 88,214
	Lighting equipment	38.30	3.25	1.39	(471)	(45)	(18)	0.469	0.200	$ 1,006	$ 1,726
	Refrig - RCx / controls	63.38	15.50	8.96	-	-	-	2.282	1.319	$ 1,208	$ 6,746
	Refrig - Cooler/Freezer equip	89.21	6.50	5.44	-	-	-	0.957	0.800	$ 864	$ 5,124
	Cooling Equipment	7.85	0.97	0.83	-	-	-	1.014	0.864	$ 407	$ 1,213
	Elec heating	10.25	1.02	0.61	(278)	(40)	(24)	0.000	0.000	$ 315	$ 430
	Shell improvement	9.13	0.20	0.21	4,914	127	131	0.201	0.207	$ 440	$ 1,132
	Refrig - Displays	11.82	5.70	2.87	-	-	-	0.839	0.422	$ 656	$ 3,656
	Clotheswashing	0.26	0.01	0.01	164	4	4	0.001	0.001	$ 8	$ 41
	Faucets / Nozzles	0.48	0.04	0.03	103	17	10	0.006	0.004	$ 5	$ 97
	Process equip	0.05	0.00	0.00	-	-	-	0.001	0.000	$ 1	$ 3
	Process equip: cooking	1.01	0.04	0.03	-	-	-	0.006	0.004	$ 22	$ 27
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.27	0.00	0.00	126	2	2	0.000	0.001	$ 1	$ 14
	Cooking	0.00	0.00	0.00	349	16	11	0.000	0.000	$ 16	$ 124
	Gas Heating Equip	0.00	0.00	0.00	525	18	22	0.000	0.000	$ 31	$ 186
	Heat Recovery	0.00	0.00	0.00	38	6	5	0.002	0.003	$ 19	$ 61
	Data / computing / office equip	0.54	0.03	0.03	(6)	(0)	(0)	0.005	0.004	$ 7	$ 20
Food Sales Total		**356.72**	**39.17**	**25.55**	**15,853**	**543**	**468**	**7.460**	**5.155**	**$ 8,582**	**$ 110,822**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Food Service	Lighting controls / design	21.88	1.29	0.99	(360)	(17)	(11)	0.179	0.138	$ 98	$ 735
	HVAC RCx / Controls	56.78	3.10	2.25	3,967	238	172	2.654	1.922	$ 2,671	$ 7,440
	DHW System improvements	84.52	4.25	3.85	2,450	168	175	0.442	0.397	$ 2,532	$ 66,981
	Lighting equipment	50.53	7.00	2.22	(673)	(74)	(32)	0.973	0.309	$ 1,012	$ 3,100
	Refrig - RCx / controls	45.67	8.52	5.18	-	-	-	0.389	0.237	$ 720	$ 3,625
	Refrig - Cooler/Freezer equip	61.48	2.75	2.82	-	-	-	0.126	0.129	$ 407	$ 1,966
	Cooling Equipment	12.69	1.77	1.47	-	-	-	1.507	1.248	$ 546	$ 2,136
	Elec heating	10.25	1.02	0.61	(223)	(40)	(24)	0.000	0.000	$ 187	$ 430
	Shell improvement	9.53	0.44	0.56	612	33	39	0.365	0.467	$ 822	$ 2,372
	Refrig - Displays	8.40	4.14	2.06	-	-	-	0.189	0.094	$ 511	$ 2,557
	Clotheswashing	11.56	0.28	0.39	926	27	34	0.030	0.041	$ 90	$ 412
	Faucets / Nozzles	5.96	0.54	0.33	329	56	31	0.057	0.034	$ 24	$ 451
	Process equip	0.30	0.02	0.01	(1)	(0)	(0)	0.003	0.002	$ 5	$ 12
	Process equip: cooking	5.72	0.18	0.13	-	-	-	0.026	0.018	$ 108	$ 123
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	1.18	0.01	0.02	675	17	24	0.001	0.002	$ 11	$ 142
	Cooking	0.00	0.00	0.00	2,365	103	74	0.000	0.000	$ 114	$ 808
	Gas Heating Equip	0.00	0.00	0.00	809	33	40	0.000	0.000	$ 61	$ 338
	Heat Recovery	0.00	0.00	0.00	45	7	4	0.000	0.000	$ 19	$ 78
	Data / computing / office equip	0.54	0.03	0.03	(5)	(0)	(0)	0.005	0.004	$ 7	$ 20
Food Service Total		**387.01**	**35.35**	**22.92**	**10,917**	**551**	**526**	**6.945**	**5.043**	**$ 9,947**	**$ 93,725**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Health Care	Lighting controls / design	126.02	11.68	6.93	(1,744)	(182)	(101)	1.657	0.982	$ 850	$ 6,405
	HVAC RCx / Controls	98.51	5.76	4.22	6,564	510	367	2.915	2.133	$ 3,322	$ 14,041
	DHW System improvements	55.47	2.11	1.79	10,672	529	539	0.295	0.250	$ 730	$ 5,604
	Lighting equipment	61.65	11.17	4.72	(797)	(171)	(70)	1.583	0.670	$ 2,898	$ 5,817
	Refrig - RCx / controls	6.04	1.13	0.69	-	-	-	0.113	0.069	$ 77	$ 502
	Refrig - Cooler/Freezer equip	9.14	0.47	0.43	-	-	-	0.047	0.043	$ 69	$ 361
	Cooling Equipment	36.43	3.62	3.21	-	-	-	1.828	1.619	$ 771	$ 3,964
	Elec heating	13.66	1.37	0.82	(334)	(53)	(32)	0.000	0.000	$ 185	$ 574
	Shell improvement	16.55	0.84	1.07	1,230	65	79	0.409	0.523	$ 953	$ 3,770
	Refrig - Displays	1.16	0.59	0.30	-	-	-	0.059	0.030	$ 54	$ 352
	Clotheswashing	3.30	0.14	0.20	2,083	56	71	0.020	0.028	$ 81	$ 574
	Faucets / Nozzles	3.16	0.29	0.18	896	119	66	0.041	0.025	$ 27	$ 653
	Process equip	1.36	0.03	0.04	(18)	(0)	(1)	0.004	0.005	$ 4	$ 16
	Process equip: cooking	1.72	0.06	0.04	-	-	-	0.008	0.006	$ 21	$ 38
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.40	0.00	0.00	1,647	35	50	0.000	0.001	$ 16	$ 279
	Cooking	0.00	0.00	0.00	1,300	62	45	0.000	0.000	$ 50	$ 492
	Gas Heating Equip	0.00	0.00	0.00	1,416	45	58	0.000	0.000	$ 102	$ 460
	Heat Recovery	0.00	0.00	0.01	73	21	17	0.002	0.003	$ 49	$ 224
	Data / computing / office equip	23.61	2.09	1.82	(228)	(28)	(26)	0.297	0.258	$ 255	$ 1,187
Health Care Total		**458.19**	**41.36**	**26.46**	**22,759**	**1,007**	**1,062**	**9.279**	**6.645**	**$ 10,513**	**$ 45,312**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Lodging	Lighting controls / design	28.78	4.30	2.68	(408)	(62)	(34)	0.455	0.283	$ 303	$ 2,351
	HVAC RCx / Controls	52.42	3.13	2.14	11,103	797	571	1.828	1.250	$ 2,422	$ 8,980
	DHW System improvements	43.84	3.88	2.16	8,360	481	492	0.450	0.250	$ 1,571	$ 6,388
	Lighting equipment	100.99	21.38	5.38	(1,480)	(190)	(80)	2.260	0.569	$ 1,766	$ 8,474
	Refrig - RCx / controls	5.33	0.99	0.61	-	-	-	0.049	0.030	$ 68	$ 431
	Refrig - Cooler/Freezer equip	7.95	0.41	0.37	-	-	-	0.021	0.019	$ 61	$ 310
	Cooling Equipment	27.05	3.18	2.67	-	-	-	1.851	1.551	$ 763	$ 3,433
	Elec heating	11.96	1.19	0.72	(274)	(46)	(28)	0.000	0.000	$ 162	$ 502
	Shell improvement	5.84	0.30	0.38	1,561	103	126	0.169	0.216	$ 898	$ 3,336
	Refrig - Displays	0.94	0.45	0.23	-	-	-	0.022	0.011	$ 39	$ 280
	Clotheswashing	7.81	0.17	0.24	2,344	67	82	0.020	0.028	$ 109	$ 709
	Faucets / Nozzles	4.26	0.38	0.23	1,074	135	74	0.044	0.026	$ 49	$ 821
	Process equip	2.59	0.10	0.08	(17)	(0)	(1)	0.011	0.009	$ 11	$ 42
	Process equip: cooking	1.52	0.05	0.04	-	-	-	0.005	0.004	$ 18	$ 33
	Pool	5.92	0.38	0.23	1,679	31	35	0.044	0.027	$ 130	$ 373
	Dishwashing	0.44	0.00	0.00	1,695	36	51	0.000	0.000	$ 17	$ 285
	Cooking	0.00	0.00	0.00	875	42	30	0.000	0.000	$ 33	$ 328
	Gas Heating Equip	0.00	0.00	0.00	2,085	67	86	0.000	0.000	$ 164	$ 682
	Heat Recovery	0.00	0.00	0.00	160	32	27	0.001	0.001	$ 75	$ 347
	Data / computing / office equip	6.90	0.39	0.33	(62)	(4)	(4)	0.041	0.035	$ 49	$ 225
Lodging Total		**314.54**	**40.71**	**18.49**	**28,695**	**1,488**	**1,428**	**7.272**	**4.310**	**$ 8,710**	**$ 38,328**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Mercantile	Lighting controls / design	93.39	6.18	4.67	(1,532)	(79)	(53)	1.100	0.831	$ 544	$ 3,729
	HVAC RCx / Controls	182.00	9.51	6.93	12,529	696	505	6.824	4.975	$ 5,391	$ 17,942
	DHW System improvements	76.59	3.18	3.05	6,183	329	335	0.578	0.554	$ 924	$ 4,683
	Lighting equipment	97.17	24.30	6.38	(1,738)	(211)	(89)	4.321	1.134	$ 2,022	$ 9,939
	Refrig - RCx / controls	28.16	5.19	3.15	-	-	-	0.415	0.252	$ 522	$ 2,238
	Refrig - Cooler/Freezer equip	36.63	1.56	1.65	-	-	-	0.125	0.132	$ 254	$ 1,141
	Cooling Equipment	62.82	7.01	5.91	-	-	-	5.016	4.224	$ 2,504	$ 8,046
	Elec heating	22.20	2.22	1.33	(481)	(86)	(52)	0.000	0.000	$ 478	$ 933
	Shell improvement	37.28	1.79	2.28	2,171	119	144	1.240	1.586	$ 4,083	$ 9,453
	Refrig - Displays	5.22	2.52	1.25	-	-	-	0.202	0.100	$ 369	$ 1,578
	Clotheswashing	0.00	0.00	0.00	1,768	44	56	0.000	0.000	$ 71	$ 383
	Faucets / Nozzles	4.20	0.39	0.23	694	93	51	0.070	0.042	$ 29	$ 566
	Process equip	0.19	0.01	0.01	-	-	-	0.002	0.001	$ 4	$ 9
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.00	0.00	0.00	1,295	28	39	0.000	0.000	$ 17	$ 220
	Cooking	0.00	0.00	0.00	1,847	83	60	0.000	0.000	$ 110	$ 655
	Gas Heating Equip	0.00	0.00	0.00	3,258	119	145	0.000	0.000	$ 247	$ 1,234
	Heat Recovery	0.00	0.00	0.00	165	27	16	0.000	0.000	$ 85	$ 284
	Data / computing / office equip	4.29	0.24	0.20	(41)	(3)	(2)	0.042	0.035	$ 54	$ 142
Mercantile Total		**650.12**	**64.11**	**37.06**	**26,118**	**1,159**	**1,155**	**19.935**	**13.869**	**$ 17,709**	**$ 63,175**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Office	Lighting controls / design	379.98	32.74	19.76	(6,520)	(501)	(285)	6.201	3.743	$ 3,430	$ 18,709
	HVAC RCx / Controls	245.02	15.68	11.39	16,970	1,192	855	7.687	5.581	$ 15,617	$ 33,017
	DHW System improvements	99.04	3.30	3.56	8,727	492	501	0.593	0.641	$ 1,842	$ 6,114
	Lighting equipment	33.70	7.18	2.38	(555)	(65)	(30)	1.360	0.451	$ 890	$ 3,138
	Refrig - RCx / controls	5.12	0.97	0.58	-	-	-	0.064	0.039	$ 134	$ 417
	Refrig - Cooler/Freezer equip	7.20	0.31	0.33	-	-	-	0.020	0.022	$ 70	$ 223
	Cooling Equipment	54.47	7.25	6.05	-	-	-	3.536	2.942	$ 3,145	$ 7,669
	Elec heating	39.28	3.93	2.35	(909)	(153)	(92)	0.000	0.000	$ 1,150	$ 1,650
	Shell improvement	0.00	1.10	1.78	-	56	90	0.536	0.866	$ 2,023	$ 5,671
	Refrig - Displays	1.03	0.50	0.25	-	-	-	0.033	0.016	$ 102	$ 309
	Clotheswashing	0.00	0.00	0.00	2,377	61	77	0.000	0.000	$ 133	$ 528
	Faucets / Nozzles	2.95	0.27	0.16	944	126	69	0.048	0.029	$ 35	$ 678
	Process equip	17.86	1.26	0.75	-	-	-	0.238	0.143	$ 366	$ 840
	Pool	4.86	0.31	0.19	-	-	-	0.056	0.034	$ 97	$ 114
	Dishwashing	0.00	0.00	0.00	1,295	39	54	0.000	0.000	$ 30	$ 304
	Cooking	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Gas Heating Equip	0.00	0.00	0.00	4,586	162	197	0.000	0.000	$ 457	$ 1,676
	Heat Recovery	0.00	0.00	0.00	239	52	43	0.001	0.002	$ 243	$ 552
	Data / computing / office equip	157.37	16.06	12.10	(1,051)	(151)	(136)	3.042	2.292	$ 4,763	$ 9,752
Office Total		**1047.89**	**90.85**	**61.64**	**26,102**	**1,310**	**1,345**	**23.417**	**16.800**	**$ 34,528**	**$ 91,360**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Other (incl. Labs)	Lighting controls / design	24.22	2.05	1.24	(398)	(31)	(18)	0.368	0.223	$ 207	$ 1,190
	HVAC RCx / Controls	19.81	1.02	0.74	3,230	179	130	0.868	0.632	$ 600	$ 2,055
	DHW System improvements	17.22	0.66	0.62	2,228	162	167	0.108	0.101	$ 571	$ 8,913
	Lighting equipment	4.21	0.88	0.27	(71)	(8)	(4)	0.158	0.049	$ 76	$ 377
	Refrig - RCx / controls	29.16	3.86	2.39	-	-	-	0.374	0.231	$ 537	$ 2,080
	Refrig - Cooler/Freezer equip	18.34	0.85	0.90	-	-	-	0.082	0.087	$ 138	$ 625
	Cooling Equipment	4.76	0.69	0.56	-	-	-	0.580	0.468	$ 279	$ 837
	Elec heating	6.83	0.68	0.41	(145)	(26)	(16)	0.000	0.000	$ 147	$ 287
	Shell improvement	4.13	0.19	0.24	764	40	47	0.157	0.201	$ 473	$ 1,130
	Refrig - Displays	1.80	0.78	0.40	-	-	-	0.076	0.039	$ 102	$ 435
	Clotheswashing	1.97	0.04	0.06	590	19	25	0.007	0.009	$ 39	$ 194
	Faucets / Nozzles	0.86	0.08	0.05	299	41	22	0.013	0.008	$ 10	$ 216
	Process equip	1.01	0.05	0.04	(5)	(0)	(0)	0.008	0.006	$ 9	$ 26
	Process equip: cooking	4.30	0.03	0.04	-	-	-	0.005	0.008	$ 6	$ 19
	Pool	1.69	0.11	0.07	-	-	-	0.018	0.011	$ 23	$ 40
	Dishwashing	1.81	0.01	0.02	454	12	17	0.002	0.004	$ 10	$ 105
	Cooking	0.00	0.00	0.00	362	4	6	0.000	0.000	$ 3	$ 35
	Gas Heating Equip	0.00	0.00	0.00	772	31	37	0.000	0.000	$ 64	$ 318
	Heat Recovery	0.00	0.00	0.00	40	7	4	0.000	0.000	$ 22	$ 73
	Data / computing / office equip	85.89	8.50	4.66	(11)	(0)	(0)	1.526	0.836	$ 2,009	$ 5,767
Other (incl. Labs) Total		**228.02**	**20.47**	**12.70**	**8,110**	**429**	**417**	**4.350**	**2.913**	**$ 5,324**	**$ 24,723**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Public Assembly	Lighting controls / design	68.54	6.02	3.64	(1,169)	(92)	(52)	1.080	0.653	$ 636	$ 3,438
	HVAC RCx / Controls	58.59	3.30	2.41	5,479	332	239	2.820	2.060	$ 2,955	$ 6,403
	DHW System improvements	14.90	0.68	0.41	3,489	184	188	0.113	0.067	$ 320	$ 1,957
	Lighting equipment	10.95	2.34	0.67	(195)	(20)	(9)	0.419	0.121	$ 217	$ 967
	Refrig - RCx / controls	2.39	0.42	0.25	-	-	-	0.041	0.025	$ 61	$ 183
	Refrig - Cooler/Freezer equip	3.69	0.12	0.13	-	-	-	0.011	0.012	$ 26	$ 88
	Cooling Equipment	11.02	1.39	1.12	-	-	-	1.185	0.948	$ 605	$ 1,591
	Elec heating	8.54	0.85	0.51	(195)	(33)	(20)	0.000	0.000	$ 263	$ 359
	Shell improvement	0.00	0.28	0.44	-	20	32	0.234	0.378	$ 538	$ 1,420
	Refrig - Displays	0.45	0.22	0.11	-	-	-	0.021	0.010	$ 46	$ 136
	Clotheswashing	0.00	0.00	0.00	888	24	30	0.000	0.000	$ 57	$ 208
	Faucets / Nozzles	1.92	0.18	0.11	374	50	27	0.029	0.017	$ 17	$ 293
	Process equip	0.82	0.04	0.03	(7)	(0)	(0)	0.007	0.006	$ 10	$ 24
	Process equip: cooking	5.37	0.04	0.05	-	-	-	0.007	0.010	$ 11	$ 25
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	2.04	0.02	0.02	656	12	17	0.003	0.004	$ 15	$ 106
	Cooking	0.00	0.00	0.00	528	32	20	0.000	0.000	$ 67	$ 253
	Gas Heating Equip	0.00	0.00	0.00	1,566	58	70	0.000	0.000	$ 176	$ 597
	Heat Recovery	0.00	0.00	0.00	-	5	7	0.003	0.004	$ 12	$ 58
	Data / computing / office equip	2.48	0.17	0.13	(25)	(2)	(2)	0.030	0.023	$ 51	$ 100
Public Assembly Total		**191.70**	**16.05**	**10.04**	**11,389**	**571**	**549**	**6.002**	**4.339**	**$ 6,083**	**$ 18,206**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Public Order and Safety	Lighting controls / design	5.95	0.56	0.33	(97)	(9)	(5)	0.101	0.060	$ 59	$ 316
	HVAC RCx / Controls	18.02	0.83	0.61	700	34	25	0.707	0.519	$ 397	$ 1,138
	DHW System improvements	-1.41	-0.07	-0.10	795	42	43	-0.011	-0.017	$ 44	$ 304
	Lighting equipment	1.30	0.37	0.10	(20)	(3)	(1)	0.066	0.017	$ 41	$ 157
	Refrig - RCx / controls	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Refrig - Cooler/Freezer equip	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Cooling Equipment	3.12	0.55	0.40	-	-	-	0.462	0.336	$ 275	$ 693
	Elec heating	3.42	0.34	0.20	(69)	(13)	(8)	0.000	0.000	$ 105	$ 143
	Shell improvement	5.25	0.64	0.47	227	28	20	0.513	0.386	$ 2,890	$ 9,186
	Refrig - Displays	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Clotheswashing	0.00	0.00	0.00	182	5	6	0.000	0.000	$ 11	$ 42
	Faucets / Nozzles	0.00	0.00	0.00	75	10	6	0.000	0.000	$ 2	$ 46
	Process equip	0.63	0.02	0.02	(9)	(0)	(0)	0.003	0.004	$ 3	$ 9
	Process equip: cooking	0.43	0.00	0.00	-	-	-	0.001	0.001	$ 1	$ 2
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.21	0.00	0.00	105	2	3	0.000	0.000	$ 2	$ 20
	Cooking	0.00	0.00	0.00	135	8	5	0.000	0.000	$ 17	$ 65
	Gas Heating Equip	0.00	0.00	0.00	192	8	9	0.000	0.000	$ 24	$ 79
	Heat Recovery	0.00	0.00	0.00	-	1	1	0.001	0.001	$ 2	$ 8
	Data / computing / office equip	2.36	0.32	0.21	(25)	(4)	(3)	0.058	0.038	$ 52	$ 187
Public Order and Safety Total		**39.26**	**3.56**	**2.25**	**2,191**	**109**	**101**	**1.900**	**1.344**	**$ 3,925**	**$ 12,394**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Religious Worship	Lighting controls / design	31.81	2.69	1.63	(531)	(41)	(23)	0.483	0.292	$ 285	$ 1,546
	HVAC RCx / Controls	23.52	1.01	0.75	4,385	209	151	0.863	0.636	$ 528	$ 1,598
	DHW System improvements	4.52	0.18	-0.03	3,133	164	167	0.029	-0.004	$ 234	$ 1,454
	Lighting equipment	5.54	1.16	0.36	(92)	(11)	(5)	0.207	0.064	$ 136	$ 493
	Refrig - RCx / controls	0.84	0.17	0.10	-	-	-	0.016	0.010	$ 25	$ 73
	Refrig - Cooler/Freezer equip	1.68	0.07	0.06	-	-	-	0.007	0.006	$ 13	$ 54
	Cooling Equipment	4.41	0.56	0.45	-	-	-	0.474	0.379	$ 212	$ 636
	Elec heating	3.42	0.34	0.20	(73)	(13)	(8)	0.000	0.000	$ 105	$ 143
	Shell improvement	6.96	0.25	0.32	1,407	50	60	0.209	0.267	$ 929	$ 2,876
	Refrig - Displays	0.17	0.09	0.04	-	-	-	0.008	0.004	$ 18	$ 54
	Clotheswashing	1.43	0.04	0.05	772	20	25	0.006	0.008	$ 54	$ 197
	Faucets / Nozzles	0.77	0.07	0.04	311	42	23	0.012	0.007	$ 11	$ 217
	Process equip	0.25	0.01	0.01	(3)	(0)	(0)	0.001	0.002	$ 1	$ 4
	Process equip: cooking	0.20	0.00	0.00	-	-	-	0.000	0.000	$ 0	$ 1
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.07	0.00	0.00	434	10	14	0.000	0.000	$ 9	$ 80
	Cooking	0.00	0.00	0.00	28	0	0	0.000	0.000	$ 0	$ 2
	Gas Heating Equip	0.00	0.00	0.00	1,141	48	58	0.000	0.000	$ 152	$ 496
	Heat Recovery	0.00	0.00	0.00	-	5	6	0.001	0.002	$ 10	$ 48
	Data / computing / office equip	0.94	0.06	0.05	(10)	(1)	(1)	0.012	0.009	$ 12	$ 39
Religious Worship Total		**86.53**	**6.69**	**4.05**	**10,901**	**481**	**469**	**2.329**	**1.682**	**$ 2,735**	**$ 10,010**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Service (light mfg)	Lighting controls / design	92.13	7.89	4.76	(1,471)	(117)	(66)	1.416	0.854	$ 808	$ 4,575
	HVAC RCx / Controls	72.22	3.68	2.70	6,521	360	261	3.139	2.301	$ 2,131	$ 7,250
	DHW System improvements	31.43	1.21	1.03	5,760	312	317	0.201	0.170	$ 552	$ 3,310
	Lighting equipment	22.29	4.48	1.63	(368)	(55)	(23)	0.805	0.293	$ 522	$ 2,165
	Refrig - RCx / controls	11.33	2.13	1.29	-	-	-	0.206	0.125	$ 214	$ 924
	Refrig - Cooler/Freezer equip	15.25	0.64	0.68	-	-	-	0.062	0.066	$ 104	$ 471
	Cooling Equipment	9.58	0.96	0.63	-	-	-	0.813	0.527	$ 283	$ 1,062
	Elec heating	10.25	1.02	0.61	(224)	(40)	(24)	0.000	0.000	$ 221	$ 430
	Shell improvement	14.83	0.71	0.91	1,128	63	77	0.587	0.752	$ 1,634	$ 3,818
	Refrig - Displays	1.83	0.92	0.45	-	-	-	0.089	0.044	$ 141	$ 610
	Clotheswashing	4.25	0.09	0.13	1,506	39	49	0.015	0.021	$ 80	$ 395
	Faucets / Nozzles	1.92	0.18	0.11	602	80	44	0.029	0.017	$ 20	$ 433
	Process equip	0.09	0.01	0.00	-	-	-	0.001	0.001	$ 2	$ 4
	Pool	0.00	0.00	0.00	-	-	-	0.000	0.000	$ -	$ -
	Dishwashing	0.00	0.00	0.00	1,057	20	27	0.000	0.000	$ 13	$ 154
	Cooking	0.00	0.00	0.00	76	1	1	0.000	0.000	$ 1	$ 4
	Gas Heating Equip	0.00	0.00	0.00	1,641	61	75	0.000	0.000	$ 128	$ 637
	Heat Recovery	0.00	0.00	0.00	85	14	8	0.000	0.000	$ 44	$ 147
	Data / computing / office equip	9.90	0.55	0.46	(95)	(6)	(6)	0.099	0.083	$ 125	$ 327
Service (light mfg) Total		**297.29**	**24.47**	**15.38**	**16,216**	**732**	**740**	**7.462**	**5.253**	**$ 7,022**	**$ 26,715**

Segment	Commercial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Warehouse and Storage	Lighting controls / design	74.12	7.91	4.61	(1,225)	(120)	(66)	2.260	1.318	$ 806	$ 5,359
	HVAC RCx / Controls	67.32	3.41	2.49	7,052	421	304	8.642	6.325	$ 2,745	$ 7,622
	DHW System improvements	4.93	0.23	0.05	1,741	149	153	0.066	0.015	$ 447	$ 5,873
	Lighting equipment	43.53	6.95	2.78	(630)	(100)	(41)	1.987	0.793	$ 1,778	$ 3,753
	Refrig - RCx / controls	239.23	17.85	12.69	-	-	-	6.668	4.739	$ 3,041	$ 9,685
	Refrig - Cooler/Freezer equip	176.30	7.53	8.03	-	-	-	2.811	2.998	$ 1,602	$ 6,214
	Cooling Equipment	7.47	1.13	0.77	-	-	-	2.826	1.904	$ 575	$ 1,896
	Elec heating	18.79	1.88	1.13	(404)	(73)	(44)	0.000	0.000	$ 550	$ 789
	Shell improvement	0.00	0.29	0.46	-	26	41	0.721	1.166	$ 524	$ 1,686
	Refrig - Displays	1.23	0.58	0.29	-	-	-	0.215	0.107	$ 117	$ 399
	Clotheswashing	1.45	0.04	0.05	581	18	23	0.010	0.014	$ 46	$ 180
	Faucets / Nozzles	0.76	0.07	0.04	268	36	20	0.020	0.012	$ 9	$ 191
	Process equip	0.54	0.03	0.02	-	-	-	0.008	0.005	$ 4	$ 13
	Pool	2.33	0.15	0.09	-	-	-	0.042	0.026	$ 45	$ 57
	Dishwashing	1.21	0.03	0.04	435	11	16	0.007	0.010	$ 21	$ 107
	Cooking	0.00	0.00	0.00	75	1	1	0.000	0.000	$ 1	$ 8
	Gas Heating Equip	0.00	0.00	0.00	1,598	73	89	0.000	0.000	$ 206	$ 755
	Heat Recovery	0.00	0.00	0.00	101	23	19	0.007	0.010	$ 109	$ 250
	Data / computing / office equip	2.75	0.18	0.14	(24)	(2)	(2)	0.052	0.041	$ 51	$ 115
Warehouse and Storage Total		**641.96**	**48.24**	**33.67**	**9,567**	**464**	**513**	**26.345**	**19.483**	**$ 12,678**	**$ 44,950**
Grand Total		**5129.18**	**469.11**	**293.97**	**217,986**	**10,263**	**10,167**	**136.483**	**97.168**	**$ 139,767**	**$ 620,678**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Pulp and Paper	Motors - VSD, Motor Optimization and Efficient Motors	244.39	38.52	16.55	4.946	2.125	$8,106	$33,065
	Motors - System Component Improvement and Replacement	224.61	17.13	10.28	2.199	1.320	$1,716	$8,265
	Lighting - Efficient System Design and Controls	20.47	6.02	3.85	0.772	0.495	$2,207	$5,776
	Motors - Improved Controls and Sensors	21.59	5.30	3.19	0.681	0.409	$1,287	$3,385
	HVAC - Efficient System Design and Controls	114.54	3.11	2.30	0.399	0.296	$201	$1,285
	Motors - Improved Operations and Maintenance	35.56	2.94	1.76	0.377	0.226	$242	$1,216
	HVAC - Improved Operations and Maintenance	16.80	2.37	1.42	0.304	0.183	$62	$363
	Motors - Process Management and Continuous Improvement	159.40	2.20	2.20	0.283	0.283	$77	$788
	HVAC - Insulation and Sealing of System Components	20.73	1.59	0.95	0.204	0.123	$149	$879
	Process Cooling - VSD, Motor Optimization and Efficient Motors	10.63	1.05	0.63	0.134	0.081	$265	$898
	Lighting - Equipment Upgrades and Replacement	3.80	0.69	0.43	0.088	0.056	$109	$615
	Process Heating (E) - Process Controls	3.65	0.65	0.39	0.083	0.050	$201	$413
	Process Cooling - Improved Operations and Maintenance	5.76	0.53	0.31	0.068	0.040	$14	$116
	HVAC - Cooling - Efficient System Design and Controls	4.49	0.45	0.27	0.058	0.035	$33	$384
	HVAC - Cooling - Equipment Upgrades and Replacement	13.78	0.36	0.34	0.046	0.043	$56	$230
	Air Compression - Improved Operations and Maintenance	2.79	0.29	0.16	0.037	0.021	$19	$108
	Process Heating (E) - Process and Waste Heat Recovery	1.48	0.28	0.17	0.036	0.022	$124	$181
	Air Compression - Efficient System Design and Controls	2.46	0.24	0.17	0.030	0.022	$25	$153
	Process Cooling - Efficient System Design and Controls	1.93	0.22	0.13	0.028	0.017	$36	$115
	Other - System Component Improvement and Replacement	3.83	0.21	0.13	0.027	0.016	$14	$75
	Air Compression - Equipment Upgrades and Replacement	6.31	0.19	0.19	0.024	0.024	$11	$129
	Process Cooling - Equipment Upgrades and Replacement	3.63	0.17	0.12	0.021	0.015	$18	$79
	Air Compression - Variable Speed Drives and Motor Upgrades	0.42	0.12	0.07	0.015	0.009	$30	$102
	Process Heating (E) - Process Management and Continuous Improvement	1.54	0.11	0.07	0.015	0.009	$15	$72
	Process Heating (E) - Heat Containment Improvements	0.39	0.07	0.04	0.009	0.005	$4	$45
	Process Heating (E) - Heat Transfer Improvements	0.38	0.07	0.04	0.009	0.005	$31	$45
	Other - Improved Operations and Maintenance	0.56	0.03	0.02	0.004	0.002	$0	$1
	Process Heating (E) - Equipment Upgrades and Replacement	0.10	0.01	0.01	0.001	0.001	$1	$2
	Other - VSD, Motor Optimization and Efficient Motors	0.79	0.00	0.00	0.000	0.000	$0	$1
Pulp and Paper Total		**926.82**	**84.89**	**46.21**	**10.899**	**5.933**	**$15,053**	**$58,786**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Food	Motors - VSD, Motor Optimization and Efficient Motors	58.02	7.73	3.33	1.115	0.480	$1,631	$6,678
	Motors - System Component Improvement and Replacement	54.79	5.04	3.02	0.726	0.436	$436	$2,083
	Lighting - Efficient System Design and Controls	23.50	7.06	4.52	1.018	0.652	$2,591	$6,817
	Motors - Improved Controls and Sensors	9.25	2.28	1.37	0.328	0.197	$553	$1,461
	HVAC - Efficient System Design and Controls	91.92	2.50	1.85	0.360	0.267	$161	$1,037
	Motors - Improved Operations and Maintenance	15.55	1.30	0.78	0.187	0.112	$109	$549
	HVAC - Improved Operations and Maintenance	13.49	1.90	1.14	0.274	0.165	$49	$293
	Motors - Process Management and Continuous Improvement	68.28	0.94	0.94	0.136	0.136	$33	$340
	HVAC - Insulation and Sealing of System Components	16.64	1.28	0.77	0.184	0.110	$119	$709
	Process Cooling - VSD, Motor Optimization and Efficient Motors	122.33	12.05	7.27	1.738	1.048	$3,045	$10,397
	Lighting - Equipment Upgrades and Replacement	4.60	0.83	0.52	0.119	0.076	$131	$746
	Process Heating (E) - Process Controls	4.19	0.65	0.39	0.094	0.057	$172	$419
	Process Cooling - Improved Operations and Maintenance	66.37	6.06	3.62	0.874	0.522	$165	$1,338
	HVAC - Cooling - Efficient System Design and Controls	5.24	0.52	0.31	0.076	0.045	$39	$451
	HVAC - Cooling - Equipment Upgrades and Replacement	16.09	0.42	0.39	0.060	0.057	$65	$269
	Air Compression - Improved Operations and Maintenance	2.76	0.28	0.16	0.041	0.024	$19	$108
	Process Heating (E) - Process and Waste Heat Recovery	1.23	0.24	0.14	0.034	0.020	$103	$151
	Air Compression - Efficient System Design and Controls	2.43	0.23	0.17	0.034	0.024	$25	$153
	Process Cooling - Efficient System Design and Controls	22.30	2.48	1.50	0.358	0.216	$419	$1,329
	Other - System Component Improvement and Replacement	4.72	0.26	0.16	0.038	0.023	$17	$93
	Air Compression - Equipment Upgrades and Replacement	6.25	0.19	0.19	0.027	0.027	$11	$129
	Process Cooling - Equipment Upgrades and Replacement	57.99	5.35	3.43	0.771	0.494	$1,449	$4,483
	Air Compression - Variable Speed Drives and Motor Upgrades	0.41	0.12	0.07	0.017	0.010	$30	$101
	Process Heating (E) - Process Management and Continuous Improvement	1.28	0.09	0.06	0.014	0.008	$12	$60
	Process Heating (E) - Heat Containment Improvements	0.33	0.06	0.04	0.009	0.005	$4	$38
	Process Heating (E) - Heat Transfer Improvements	0.31	0.06	0.04	0.008	0.005	$26	$38
	Other - Improved Operations and Maintenance	0.69	0.04	0.02	0.005	0.003	$0	$1
	Process Heating (E) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0.000	0.000	$0	$0
	Other - VSD, Motor Optimization and Efficient Motors	0.97	0.00	0.00	0.000	0.000	$1	$1
Food Total		**671.94**	**59.95**	**36.20**	**8.644**	**5.219**	**$11,415**	**$40,273**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Metals Primary	Motors - VSD, Motor Optimization and Efficient Motors	33.32	4.47	1.92	0.599	0.258	$942	$3,845
	Motors - System Component Improvement and Replacement	54.21	4.13	2.48	0.554	0.332	$414	$1,999
	Lighting - Efficient System Design and Controls	9.56	2.72	1.74	0.364	0.233	$997	$2,614
	Motors - Improved Controls and Sensors	5.21	1.28	0.77	0.172	0.103	$312	$820
	HVAC - Efficient System Design and Controls	38.77	1.05	0.78	0.141	0.104	$68	$436
	Motors - Improved Operations and Maintenance	8.58	0.71	0.43	0.095	0.057	$58	$294
	HVAC - Improved Operations and Maintenance	5.69	0.80	0.48	0.107	0.065	$21	$123
	Motors - Process Management and Continuous Improvement	38.47	0.53	0.53	0.071	0.071	$19	$191
	HVAC - Insulation and Sealing of System Components	7.02	0.54	0.32	0.072	0.043	$50	$298
	Process Cooling - VSD, Motor Optimization and Efficient Motors	3.44	0.34	0.20	0.045	0.027	$86	$292
	Lighting - Equipment Upgrades and Replacement	1.82	0.33	0.21	0.044	0.028	$52	$294
	Process Heating (E) - Process Controls	22.74	4.20	2.52	0.563	0.338	$1,360	$2,686
	Process Cooling - Improved Operations and Maintenance	1.87	0.17	0.10	0.023	0.014	$5	$38
	HVAC - Cooling - Efficient System Design and Controls	2.46	0.25	0.15	0.033	0.020	$18	$211
	HVAC - Cooling - Equipment Upgrades and Replacement	7.56	0.19	0.19	0.026	0.025	$30	$126
	Air Compression - Improved Operations and Maintenance	1.69	0.17	0.10	0.023	0.013	$12	$66
	Process Heating (E) - Process and Waste Heat Recovery	10.25	1.93	1.16	0.259	0.156	$851	$1,237
	Air Compression - Efficient System Design and Controls	1.49	0.14	0.10	0.019	0.014	$15	$93
	Process Cooling - Efficient System Design and Controls	0.63	0.07	0.04	0.009	0.006	$12	$37
	Other - System Component Improvement and Replacement	20.42	1.13	0.68	0.152	0.091	$74	$400
	Air Compression - Equipment Upgrades and Replacement	3.84	0.12	0.12	0.015	0.016	$7	$79
	Process Cooling - Equipment Upgrades and Replacement	1.18	0.05	0.04	0.007	0.005	$6	$26
	Air Compression - Variable Speed Drives and Motor Upgrades	0.25	0.07	0.04	0.010	0.006	$18	$62
	Process Heating (E) - Process Management and Continuous Improvement	10.51	0.77	0.47	0.104	0.062	$101	$495
	Process Heating (E) - Heat Containment Improvements	2.69	0.48	0.29	0.065	0.039	$30	$310
	Process Heating (E) - Heat Transfer Improvements	2.52	0.48	0.29	0.065	0.039	$212	$308
	Other - Improved Operations and Maintenance	2.98	0.16	0.10	0.021	0.013	$1	$6
	Process Heating (E) - Equipment Upgrades and Replacement	0.69	0.04	0.06	0.006	0.008	$4	$15
	Other - VSD, Motor Optimization and Efficient Motors	4.20	0.00	0.00	0.001	0.001	$3	$5
Metals Primary Total		**304.07**	**27.36**	**16.32**	**3.666**	**2.186**	**$5,776**	**$17,407**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Fabricated Metals	Motors - VSD, Motor Optimization and Efficient Motors	40.93	5.77	2.48	0.874	0.376	$1,217	$4,999
	Motors - System Component Improvement and Replacement	58.00	4.42	2.65	0.670	0.402	$443	$2,152
	Lighting - Efficient System Design and Controls	22.05	6.86	4.39	1.039	0.665	$2,517	$6,639
	Motors - Improved Controls and Sensors	5.58	1.37	0.82	0.208	0.125	$333	$883
	HVAC - Efficient System Design and Controls	78.19	2.12	1.57	0.321	0.238	$137	$884
	Motors - Improved Operations and Maintenance	9.18	0.76	0.45	0.115	0.069	$63	$317
	HVAC - Improved Operations and Maintenance	11.47	1.62	0.97	0.245	0.147	$42	$250
	Motors - Process Management and Continuous Improvement	41.16	0.57	0.57	0.086	0.086	$20	$205
	HVAC - Insulation and Sealing of System Components	14.15	1.09	0.65	0.164	0.099	$101	$605
	Process Cooling - VSD, Motor Optimization and Efficient Motors	11.73	1.16	0.70	0.175	0.106	$292	$1,000
	Lighting - Equipment Upgrades and Replacement	4.60	0.83	0.52	0.125	0.079	$131	$747
	Process Heating (E) - Process Controls	14.11	2.62	1.58	0.397	0.238	$862	$1,687
	Process Cooling - Improved Operations and Maintenance	6.36	0.58	0.35	0.088	0.053	$16	$129
	HVAC - Cooling - Efficient System Design and Controls	5.23	0.52	0.31	0.079	0.048	$39	$452
	HVAC - Cooling - Equipment Upgrades and Replacement	16.06	0.41	0.39	0.063	0.060	$65	$270
	Air Compression - Improved Operations and Maintenance	3.39	0.35	0.20	0.053	0.030	$23	$133
	Process Heating (E) - Process and Waste Heat Recovery	6.51	1.23	0.74	0.186	0.112	$540	$790
	Air Compression - Efficient System Design and Controls	2.99	0.29	0.21	0.044	0.031	$30	$188
	Process Cooling - Efficient System Design and Controls	2.14	0.24	0.14	0.036	0.022	$40	$128
	Other - System Component Improvement and Replacement	4.08	0.23	0.14	0.034	0.021	$15	$80
	Air Compression - Equipment Upgrades and Replacement	7.68	0.23	0.23	0.035	0.035	$13	$158
	Process Cooling - Equipment Upgrades and Replacement	4.00	0.18	0.13	0.028	0.019	$20	$88
	Air Compression - Variable Speed Drives and Motor Upgrades	0.51	0.14	0.09	0.022	0.013	$37	$125
	Process Heating (E) - Process Management and Continuous Improvement	6.67	0.49	0.30	0.074	0.045	$64	$316
	Process Heating (E) - Heat Containment Improvements	1.71	0.31	0.18	0.047	0.028	$19	$198
	Process Heating (E) - Heat Transfer Improvements	1.57	0.30	0.18	0.046	0.028	$134	$196
	Other - Improved Operations and Maintenance	0.59	0.03	0.02	0.005	0.003	$0	$1
	Process Heating (E) - Equipment Upgrades and Replacement	0.22	0.01	0.02	0.002	0.003	$1	$5
	Other - VSD, Motor Optimization and Efficient Motors	0.84	0.00	0.00	0.000	0.000	$1	$1
Fabricated Metals Total		**381.71**	**34.74**	**21.00**	**5.259**	**3.179**	**$7,214**	**$23,626**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Chemicals	Motors - VSD, Motor Optimization and Efficient Motors	75.35	11.30	4.86	1.395	0.600	$2,379	$9,681
	Motors - System Component Improvement and Replacement	86.64	6.61	3.96	0.816	0.490	$662	$3,182
	Lighting - Efficient System Design and Controls	11.99	3.60	2.31	0.445	0.285	$1,321	$3,452
	Motors - Improved Controls and Sensors	8.33	2.05	1.23	0.253	0.152	$497	$1,304
	HVAC - Efficient System Design and Controls	55.98	1.52	1.13	0.188	0.139	$98	$627
	Motors - Improved Operations and Maintenance	13.72	1.13	0.68	0.140	0.084	$93	$468
	HVAC - Improved Operations and Maintenance	8.21	1.16	0.70	0.143	0.086	$30	$177
	Motors - Process Management and Continuous Improvement	61.49	0.85	0.85	0.105	0.105	$30	$304
	HVAC - Insulation and Sealing of System Components	10.13	0.78	0.47	0.096	0.058	$73	$429
	Process Cooling - VSD, Motor Optimization and Efficient Motors	32.31	3.18	1.92	0.393	0.237	$804	$2,726
	Lighting - Equipment Upgrades and Replacement	2.27	0.41	0.26	0.051	0.032	$65	$367
	Process Heating (E) - Process Controls	2.64	0.46	0.28	0.057	0.034	$144	$296
	Process Cooling - Improved Operations and Maintenance	17.53	1.60	0.96	0.198	0.118	$44	$351
	HVAC - Cooling - Efficient System Design and Controls	3.45	0.34	0.21	0.043	0.026	$25	$295
	HVAC - Cooling - Equipment Upgrades and Replacement	10.59	0.27	0.26	0.034	0.032	$43	$176
	Air Compression - Improved Operations and Maintenance	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Process and Waste Heat Recovery	1.08	0.20	0.12	0.025	0.015	$89	$129
	Air Compression - Efficient System Design and Controls	-	-	-	0.000	0.000	$0	$0
	Process Cooling - Efficient System Design and Controls	5.88	0.66	0.40	0.081	0.049	$111	$348
	Other - System Component Improvement and Replacement	11.09	0.62	0.37	0.076	0.046	$40	$216
	Air Compression - Equipment Upgrades and Replacement	-	-	-	0.000	0.000	$0	$0
	Process Cooling - Equipment Upgrades and Replacement	11.03	0.50	0.35	0.062	0.044	$55	$240
	Air Compression - Variable Speed Drives and Motor Upgrades	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Process Management and Continuous Improvement	1.10	0.08	0.05	0.010	0.006	$11	$52
	Process Heating (E) - Heat Containment Improvements	0.28	0.05	0.03	0.006	0.004	$3	$32
	Process Heating (E) - Heat Transfer Improvements	0.26	0.05	0.03	0.006	0.004	$22	$32
	Other - Improved Operations and Maintenance	1.62	0.09	0.05	0.011	0.006	$1	$3
	Process Heating (E) - Equipment Upgrades and Replacement	0.07	0.00	0.01	0.001	0.001	$0	$2
	Other - VSD, Motor Optimization and Efficient Motors	2.28	0.00	0.00	0.000	0.000	$1	$3
Chemicals Total		**435.32**	**37.52**	**21.47**	**4.634**	**2.651**	**$6,643**	**$24,893**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Machinery	Motors - VSD, Motor Optimization and Efficient Motors	47.06	6.64	2.85	1.089	0.468	$1,399	$5,774
	Motors - System Component Improvement and Replacement	68.89	5.22	3.16	0.857	0.518	$552	$2,536
	Lighting - Efficient System Design and Controls	33.73	10.45	6.69	1.714	1.098	$3,835	$10,160
	Motors - Improved Controls and Sensors	6.41	1.58	0.95	0.259	0.155	$383	$1,019
	HVAC - Efficient System Design and Controls	148.92	4.04	3.00	0.663	0.491	$261	$1,692
	Motors - Improved Operations and Maintenance	10.56	0.87	0.52	0.143	0.086	$72	$366
	HVAC - Improved Operations and Maintenance	21.85	3.08	1.85	0.505	0.304	$80	$479
	Motors - Process Management and Continuous Improvement	47.33	0.65	0.65	0.107	0.107	$23	$237
	HVAC - Insulation and Sealing of System Components	26.95	2.07	1.24	0.339	0.203	$193	$1,158
	Process Cooling - VSD, Motor Optimization and Efficient Motors	11.56	1.14	0.69	0.187	0.113	$288	$990
	Lighting - Equipment Upgrades and Replacement	5.77	1.05	0.66	0.173	0.109	$170	$956
	Process Heating (E) - Process Controls	4.72	0.89	0.53	0.145	0.087	$291	$572
	Process Cooling - Improved Operations and Maintenance	6.27	0.57	0.34	0.094	0.056	$16	$127
	HVAC - Cooling - Efficient System Design and Controls	9.96	1.00	0.60	0.163	0.098	$74	$864
	HVAC - Cooling - Equipment Upgrades and Replacement	30.60	0.79	0.75	0.129	0.123	$123	$516
	Air Compression - Improved Operations and Maintenance	4.92	0.50	0.29	0.083	0.048	$34	$194
	Process Heating (E) - Process and Waste Heat Recovery	2.20	0.41	0.25	0.068	0.041	$182	$268
	Air Compression - Efficient System Design and Controls	4.34	0.42	0.30	0.069	0.049	$44	$275
	Process Cooling - Efficient System Design and Controls	2.11	0.23	0.14	0.038	0.023	$40	$126
	Other - System Component Improvement and Replacement	3.16	0.18	0.11	0.029	0.017	$11	$63
	Air Compression - Equipment Upgrades and Replacement	11.15	0.34	0.34	0.055	0.055	$19	$231
	Process Cooling - Equipment Upgrades and Replacement	3.95	0.18	0.13	0.029	0.021	$20	$87
	Air Compression - Variable Speed Drives and Motor Upgrades	0.74	0.21	0.13	0.034	0.021	$53	$182
	Process Heating (E) - Process Management and Continuous Improvement	2.25	0.17	0.10	0.027	0.016	$22	$107
	Process Heating (E) - Heat Containment Improvements	0.58	0.10	0.06	0.017	0.010	$6	$67
	Process Heating (E) - Heat Transfer Improvements	0.54	0.10	0.06	0.017	0.010	$45	$67
	Other - Improved Operations and Maintenance	0.46	0.02	0.01	0.004	0.002	$0	$1
	Process Heating (E) - Equipment Upgrades and Replacement	0.07	0.00	0.01	0.001	0.001	$0	$2
	Other - VSD, Motor Optimization and Efficient Motors	0.65	0.00	0.00	0.000	0.000	$0	$1
Machinery Total		**517.71**	**42.92**	**26.41**	**7.039**	**4.331**	**$8,238**	**$29,116**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Plastics and Rubber	Motors - VSD, Motor Optimization and Efficient Motors	29.51	4.16	1.79	0.573	0.246	$877	$3,586
	Motors - System Component Improvement and Replacement	41.81	3.19	1.91	0.439	0.263	$319	$1,544
	Lighting - Efficient System Design and Controls	12.24	3.49	2.24	0.481	0.308	$1,282	$3,365
	Motors - Improved Controls and Sensors	4.02	0.99	0.59	0.136	0.082	$240	$633
	HVAC - Efficient System Design and Controls	46.66	1.27	0.94	0.174	0.129	$82	$525
	Motors - Improved Operations and Maintenance	6.62	0.55	0.33	0.075	0.045	$45	$227
	HVAC - Improved Operations and Maintenance	6.85	0.97	0.58	0.133	0.080	$25	$149
	Motors - Process Management and Continuous Improvement	29.67	0.41	0.41	0.056	0.056	$14	$147
	HVAC - Insulation and Sealing of System Components	8.45	0.65	0.39	0.089	0.054	$61	$359
	Process Cooling - VSD, Motor Optimization and Efficient Motors	16.44	1.62	0.98	0.223	0.134	$409	$1,394
	Lighting - Equipment Upgrades and Replacement	2.34	0.42	0.27	0.058	0.037	$66	$378
	Process Heating (E) - Process Controls	5.85	1.06	0.64	0.146	0.088	$344	$680
	Process Cooling - Improved Operations and Maintenance	8.92	0.81	0.49	0.112	0.067	$22	$179
	HVAC - Cooling - Efficient System Design and Controls	3.03	0.30	0.18	0.042	0.025	$22	$260
	HVAC - Cooling - Equipment Upgrades and Replacement	9.30	0.24	0.23	0.033	0.031	$38	$155
	Air Compression - Improved Operations and Maintenance	2.67	0.27	0.16	0.038	0.022	$18	$104
	Process Heating (E) - Process and Waste Heat Recovery	2.53	0.49	0.29	0.067	0.040	$214	$311
	Air Compression - Efficient System Design and Controls	2.35	0.23	0.16	0.031	0.022	$24	$148
	Process Cooling - Efficient System Design and Controls	3.00	0.33	0.20	0.046	0.028	$56	$178
	Other - System Component Improvement and Replacement	0.45	0.02	0.01	0.003	0.002	$2	$9
	Air Compression - Equipment Upgrades and Replacement	6.05	0.18	0.18	0.025	0.025	$10	$124
	Process Cooling - Equipment Upgrades and Replacement	5.61	0.26	0.18	0.035	0.025	$28	$123
	Air Compression - Variable Speed Drives and Motor Upgrades	0.40	0.11	0.07	0.016	0.009	$29	$98
	Process Heating (E) - Process Management and Continuous Improvement	2.65	0.20	0.12	0.027	0.016	$25	$125
	Process Heating (E) - Heat Containment Improvements	0.68	0.12	0.07	0.017	0.010	$8	$78
	Process Heating (E) - Heat Transfer Improvements	0.62	0.12	0.07	0.017	0.010	$53	$78
	Other - Improved Operations and Maintenance	0.07	0.00	0.00	0.000	0.000	$0	$0
	Process Heating (E) - Equipment Upgrades and Replacement	0.17	0.01	0.01	0.001	0.002	$1	$4
	Other - VSD, Motor Optimization and Efficient Motors	0.09	0.00	0.00	0.000	0.000	$0	$0
Plastics and Rubber Total		**259.05**	**22.48**	**13.50**	**3.095**	**1.858**	**$4,316**	**$14,962**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Transport Equipment	Motors - VSD, Motor Optimization and Efficient Motors	18.18	2.56	1.10	0.385	0.166	$540	$2,219
	Motors - System Component Improvement and Replacement	25.76	1.96	1.18	0.295	0.177	$197	$955
	Lighting - Efficient System Design and Controls	16.30	4.92	3.15	0.738	0.473	$1,804	$4,756
	Motors - Improved Controls and Sensors	2.48	0.61	0.37	0.091	0.055	$148	$392
	HVAC - Efficient System Design and Controls	67.25	1.83	1.35	0.274	0.203	$118	$760
	Motors - Improved Operations and Maintenance	4.08	0.34	0.20	0.051	0.030	$28	$141
	HVAC - Improved Operations and Maintenance	9.87	1.39	0.84	0.209	0.126	$36	$215
	Motors - Process Management and Continuous Improvement	18.28	0.25	0.25	0.038	0.038	$9	$91
	HVAC - Insulation and Sealing of System Components	12.17	0.93	0.56	0.140	0.084	$87	$520
	Process Cooling - VSD, Motor Optimization and Efficient Motors	6.83	0.67	0.41	0.101	0.061	$170	$582
	Lighting - Equipment Upgrades and Replacement	3.68	0.66	0.42	0.099	0.063	$103	$594
	Process Heating (E) - Process Controls	2.70	0.50	0.30	0.075	0.045	$164	$320
	Process Cooling - Improved Operations and Maintenance	3.71	0.34	0.20	0.051	0.030	$9	$75
	HVAC - Cooling - Efficient System Design and Controls	4.45	0.45	0.27	0.067	0.040	$33	$384
	HVAC - Cooling - Equipment Upgrades and Replacement	13.68	0.35	0.33	0.053	0.050	$55	$230
	Air Compression - Improved Operations and Maintenance	2.92	0.30	0.17	0.045	0.026	$20	$114
	Process Heating (E) - Process and Waste Heat Recovery	1.19	0.23	0.14	0.035	0.021	$102	$149
	Air Compression - Efficient System Design and Controls	2.58	0.25	0.18	0.037	0.027	$26	$162
	Process Cooling - Efficient System Design and Controls	1.24	0.14	0.08	0.021	0.013	$23	$74
	Other - System Component Improvement and Replacement	0.69	0.04	0.02	0.006	0.003	$2	$14
	Air Compression - Equipment Upgrades and Replacement	6.62	0.20	0.20	0.030	0.030	$11	$136
	Process Cooling - Equipment Upgrades and Replacement	2.33	0.11	0.07	0.016	0.011	$12	$51
	Air Compression - Variable Speed Drives and Motor Upgrades	0.44	0.12	0.07	0.019	0.011	$32	$108
	Process Heating (E) - Process Management and Continuous Improvement	1.27	0.09	0.06	0.014	0.008	$12	$60
	Process Heating (E) - Heat Containment Improvements	0.32	0.06	0.04	0.009	0.005	$4	$38
	Process Heating (E) - Heat Transfer Improvements	0.30	0.06	0.03	0.009	0.005	$26	$37
	Other - Improved Operations and Maintenance	0.10	0.01	0.00	0.001	0.000	$0	$0
	Process Heating (E) - Equipment Upgrades and Replacement	0.04	0.00	0.00	0.000	0.001	$0	$1
	Other - VSD, Motor Optimization and Efficient Motors	0.14	0.00	0.00	0.000	0.000	$0	$0
Transport Equipment Total		**229.61**	**19.36**	**12.01**	**2.906**	**1.802**	**$3,771**	**$13,180**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Wood Products	Motors - VSD, Motor Optimization and Efficient Motors	32.76	4.62	1.99	0.713	0.306	$974	$4,006
	Motors - System Component Improvement and Replacement	46.43	3.54	2.12	0.546	0.328	$355	$1,724
	Lighting - Efficient System Design and Controls	8.95	2.55	1.64	0.394	0.252	$937	$2,474
	Motors - Improved Controls and Sensors	4.46	1.10	0.66	0.169	0.102	$267	$707
	HVAC - Efficient System Design and Controls	27.48	0.75	0.55	0.115	0.085	$48	$311
	Motors - Improved Operations and Maintenance	7.35	0.61	0.36	0.094	0.056	$50	$254
	HVAC - Improved Operations and Maintenance	4.03	0.57	0.34	0.088	0.053	$15	$88
	Motors - Process Management and Continuous Improvement	32.95	0.46	0.46	0.070	0.070	$16	$164
	HVAC - Insulation and Sealing of System Components	4.97	0.38	0.23	0.059	0.035	$36	$213
	Process Cooling - VSD, Motor Optimization and Efficient Motors	1.01	0.10	0.06	0.015	0.009	$25	$86
	Lighting - Equipment Upgrades and Replacement	1.61	0.29	0.18	0.045	0.028	$46	$263
	Process Heating (E) - Process Controls	1.79	0.31	0.19	0.048	0.029	$97	$202
	Process Cooling - Improved Operations and Maintenance	0.55	0.05	0.03	0.008	0.005	$1	$11
	HVAC - Cooling - Efficient System Design and Controls	1.71	0.17	0.10	0.026	0.016	$13	$148
	HVAC - Cooling - Equipment Upgrades and Replacement	5.25	0.14	0.13	0.021	0.020	$21	$88
	Air Compression - Improved Operations and Maintenance	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Process and Waste Heat Recovery	0.71	0.14	0.08	0.021	0.013	$60	$88
	Air Compression - Efficient System Design and Controls	-	-	-	0.000	0.000	$0	$0
	Process Cooling - Efficient System Design and Controls	0.18	0.02	0.01	0.003	0.002	$3	$11
	Other - System Component Improvement and Replacement	1.96	0.11	0.07	0.017	0.010	$7	$39
	Air Compression - Equipment Upgrades and Replacement	-	-	-	0.000	0.000	$0	$0
	Process Cooling - Equipment Upgrades and Replacement	0.34	0.02	0.01	0.002	0.002	$2	$8
	Air Compression - Variable Speed Drives and Motor Upgrades	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Process Management and Continuous Improvement	0.74	0.05	0.03	0.008	0.005	$7	$35
	Process Heating (E) - Heat Containment Improvements	0.19	0.03	0.02	0.005	0.003	$2	$22
	Process Heating (E) - Heat Transfer Improvements	0.17	0.03	0.02	0.005	0.003	$15	$22
	Other - Improved Operations and Maintenance	0.29	0.02	0.01	0.002	0.001	$0	$1
	Process Heating (E) - Equipment Upgrades and Replacement	0.05	0.00	0.00	0.000	0.001	$0	$1
	Other - VSD, Motor Optimization and Efficient Motors	0.40	0.00	0.00	0.000	0.000	$0	$0
Wood Products Total		**186.35**	**16.05**	**9.30**	**2.476**	**1.434**	**$2,998**	**$10,966**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Beverage and Tobacco	Motors - VSD, Motor Optimization and Efficient Motors	2.23	0.30	0.13	0.043	0.018	$63	$257
	Motors - System Component Improvement and Replacement	2.11	0.12	0.08	0.017	0.012	$14	$69
	Lighting - Efficient System Design and Controls	1.50	0.43	0.27	0.062	0.040	$157	$413
	Motors - Improved Controls and Sensors	0.36	0.09	0.05	0.013	0.008	$21	$56
	HVAC - Efficient System Design and Controls	6.60	0.18	0.13	0.026	0.019	$12	$74
	Motors - Improved Operations and Maintenance	0.60	0.05	0.03	0.007	0.004	$4	$21
	HVAC - Improved Operations and Maintenance	0.97	0.14	0.08	0.020	0.012	$4	$21
	Motors - Process Management and Continuous Improvement	2.63	0.04	0.04	0.005	0.005	$1	$13
	HVAC - Insulation and Sealing of System Components	1.19	0.09	0.05	0.013	0.008	$9	$51
	Process Cooling - VSD, Motor Optimization and Efficient Motors	6.54	0.64	0.39	0.093	0.056	$163	$555
	Lighting - Equipment Upgrades and Replacement	0.28	0.07	0.03	0.010	0.005	$10	$60
	Process Heating (E) - Process Controls	0.13	0.02	0.01	0.003	0.002	$5	$13
	Process Cooling - Improved Operations and Maintenance	3.55	0.32	0.19	0.047	0.028	$9	$71
	HVAC - Cooling - Efficient System Design and Controls	0.41	0.04	0.02	0.006	0.004	$3	$36
	HVAC - Cooling - Equipment Upgrades and Replacement	1.27	0.03	0.03	0.005	0.004	$5	$21
	Air Compression - Improved Operations and Maintenance	0.23	0.02	0.01	0.003	0.002	$2	$9
	Process Heating (E) - Process and Waste Heat Recovery	0.04	0.01	0.00	0.001	0.001	$3	$5
	Air Compression - Efficient System Design and Controls	0.20	0.02	0.01	0.003	0.002	$2	$13
	Process Cooling - Efficient System Design and Controls	1.19	0.13	0.08	0.019	0.012	$22	$71
	Other - System Component Improvement and Replacement	0.18	0.01	0.01	0.001	0.001	$1	$4
	Air Compression - Equipment Upgrades and Replacement	0.52	0.02	0.02	0.002	0.002	$1	$11
	Process Cooling - Equipment Upgrades and Replacement	3.10	0.29	0.18	0.041	0.026	$77	$240
	Air Compression - Variable Speed Drives and Motor Upgrades	0.03	0.01	0.01	0.001	0.001	$3	$8
	Process Heating (E) - Process Management and Continuous Improvement	0.04	0.00	0.00	0.000	0.000	$0	$2
	Process Heating (E) - Heat Containment Improvements	0.01	0.00	0.00	0.000	0.000	$0	$1
	Process Heating (E) - Heat Transfer Improvements	0.01	0.00	0.00	0.000	0.000	$1	$1
	Other - Improved Operations and Maintenance	0.03	0.00	0.00	0.000	0.000	$0	$0
	Process Heating (E) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0.000	0.000	$0	$0
	Other - VSD, Motor Optimization and Efficient Motors	0.04	0.00	0.00	0.000	0.000	$0	$0
Beverage and Tobacco Total		**35.98**	**3.07**	**1.88**	**0.443**	**0.271**	**$592**	**$2,097**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
WWTF	Motors - VSD, Motor Optimization and Efficient Motors	8.44	1.19	0.51	0.187	0.080	$251	$1,033
	Motors - System Component Improvement and Replacement	20.25	1.37	0.82	0.215	0.129	$151	$742
	Lighting - Efficient System Design and Controls	2.26	0.66	0.42	0.104	0.067	$243	$643
	Motors - Improved Controls and Sensors	1.15	0.28	0.17	0.044	0.027	$69	$182
	HVAC - Efficient System Design and Controls	-	-	-	0.000	0.000	$0	$0
	Motors - Improved Operations and Maintenance	1.89	0.16	0.09	0.025	0.015	$13	$65
	HVAC - Improved Operations and Maintenance	-	-	-	0.000	0.000	$0	$0
	Motors - Process Management and Continuous Improvement	8.49	0.12	0.12	0.018	0.018	$4	$42
	HVAC - Insulation and Sealing of System Components	-	-	-	0.000	0.000	$0	$0
	Process Cooling - VSD, Motor Optimization and Efficient Motors	-	-	-	0.000	0.000	$0	$0
	Lighting - Equipment Upgrades and Replacement	0.43	0.08	0.05	0.012	0.008	$12	$70
	Process Heating (E) - Process Controls	-	-	-	0.000	0.000	$0	$0
	Process Cooling - Improved Operations and Maintenance	-	-	-	0.000	0.000	$0	$0
	HVAC - Cooling - Efficient System Design and Controls	-	-	-	0.000	0.000	$0	$0
	HVAC - Cooling - Equipment Upgrades and Replacement	-	-	-	0.000	0.000	$0	$0
	Air Compression - Improved Operations and Maintenance	21.38	2.19	1.27	0.344	0.199	$146	$841
	Process Heating (E) - Process and Waste Heat Recovery	-	-	-	0.000	0.000	$0	$0
	Air Compression - Efficient System Design and Controls	18.89	1.82	1.30	0.286	0.204	$192	$1,191
	Process Cooling - Efficient System Design and Controls	-	-	-	0.000	0.000	$0	$0
	Other - System Component Improvement and Replacement	0.69	0.04	0.02	0.006	0.004	$2	$14
	Air Compression - Equipment Upgrades and Replacement	48.49	1.46	1.46	0.229	0.230	$82	$1,002
	Process Cooling - Equipment Upgrades and Replacement	-	-	-	0.000	0.000	$0	$0
	Air Compression - Variable Speed Drives and Motor Upgrades	3.21	0.91	0.55	0.143	0.086	$232	$790
	Process Heating (E) - Process Management and Continuous Improvement	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Heat Containment Improvements	-	-	-	0.000	0.000	$0	$0
	Process Heating (E) - Heat Transfer Improvements	-	-	-	0.000	0.000	$0	$0
	Other - Improved Operations and Maintenance	0.10	0.01	0.00	0.001	0.001	$0	$0
	Process Heating (E) - Equipment Upgrades and Replacement	-	-	-	0.000	0.000	$0	$0
	Other - VSD, Motor Optimization and Efficient Motors	0.14	0.00	0.00	0.000	0.000	$0	$0
WWTF Total		**135.80**	**10.29**	**6.79**	**1.614**	**1.066**	**$1,399**	**$6,615**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Other	Motors - VSD, Motor Optimization and Efficient Motors	72.67	10.25	4.41	1.608	0.692	$2,160	$8,893
	Motors - System Component Improvement and Replacement	122.86	8.96	5.37	1.405	0.843	$930	$4,541
	Lighting - Efficient System Design and Controls	24.26	6.90	4.42	1.083	0.693	$2,532	$6,691
	Motors - Improved Controls and Sensors	9.90	2.43	1.46	0.382	0.230	$592	$1,570
	HVAC - Efficient System Design and Controls	100.64	2.73	2.02	0.429	0.318	$177	$1,141
	Motors - Improved Operations and Maintenance	16.30	1.35	0.81	0.211	0.127	$111	$563
	HVAC - Improved Operations and Maintenance	14.76	2.08	1.25	0.327	0.196	$54	$323
	Motors - Process Management and Continuous Improvement	73.08	1.01	1.01	0.158	0.158	$35	$365
	HVAC - Insulation and Sealing of System Components	18.22	1.40	0.84	0.219	0.132	$131	$780
	Process Cooling - VSD, Motor Optimization and Efficient Motors	32.18	3.17	1.91	0.497	0.300	$801	$2,748
	Lighting - Equipment Upgrades and Replacement	4.49	0.81	0.51	0.127	0.080	$128	$732
	Process Heating (E) - Process Controls	9.93	1.83	1.10	0.287	0.172	$602	$1,180
	Process Cooling - Improved Operations and Maintenance	17.46	1.59	0.95	0.250	0.149	$44	$353
	HVAC - Cooling - Efficient System Design and Controls	6.50	0.65	0.39	0.102	0.061	$48	$563
	HVAC - Cooling - Equipment Upgrades and Replacement	19.97	0.52	0.49	0.081	0.077	$81	$336
	Air Compression - Improved Operations and Maintenance	4.18	0.43	0.25	0.067	0.039	$29	$164
	Process Heating (E) - Process and Waste Heat Recovery	4.43	0.85	0.51	0.134	0.080	$375	$549
	Air Compression - Efficient System Design and Controls	3.68	0.35	0.25	0.056	0.040	$37	$232
	Process Cooling - Efficient System Design and Controls	5.87	0.65	0.39	0.102	0.062	$110	$351
	Other - System Component Improvement and Replacement	9.44	0.52	0.31	0.082	0.049	$34	$187
	Air Compression - Equipment Upgrades and Replacement	9.45	0.28	0.29	0.045	0.045	$16	$195
	Process Cooling - Equipment Upgrades and Replacement	10.99	0.50	0.35	0.079	0.055	$55	$242
	Air Compression - Variable Speed Drives and Motor Upgrades	0.63	0.18	0.11	0.028	0.017	$45	$154
	Process Heating (E) - Process Management and Continuous Improvement	4.65	0.34	0.21	0.054	0.032	$45	$221
	Process Heating (E) - Heat Containment Improvements	1.19	0.21	0.13	0.034	0.020	$13	$138
	Process Heating (E) - Heat Transfer Improvements	1.09	0.21	0.13	0.033	0.020	$93	$137
	Other - Improved Operations and Maintenance	1.38	0.07	0.04	0.012	0.007	$1	$3
	Process Heating (E) - Equipment Upgrades and Replacement	0.15	0.01	0.01	0.001	0.002	$1	$3
	Other - VSD, Motor Optimization and Efficient Motors	1.94	0.00	0.00	0.000	0.000	$1	$2
Other Total		**602.30**	**50.31**	**29.94**	**7.893**	**4.697**	**$9,280**	**$33,357**
Grand Total		**4,686.68**	**408.93**	**241.00**	**58.569**	**34.628**	**$76,695**	**$275,278**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Pulp and Paper	Steam Production - Improved Operations and Maintenance	16,624	2,406	1,422	$1,808	$15,954
	Steam Production - Improved System Design and Controls	6,929	1,555	833	$2,382	$14,064
	Process Heating (G) - Improved Operations and Maintenance	8,702	706	489	$303	$4,021
	Process Heating (G) - Insulation and Sealing of System Components	3,833	471	283	$212	$3,709
	Steam Production - Equipment Upgrades and Replacement	11,542	415	323	$1,286	$4,562
	Steam Production - Waste and/or Process Heat Recovery	8,660	375	298	$483	$3,973
	Process Heating (G) - Equipment Upgrades and Replacement	9,859	316	267	$655	$3,005
	Steam Production - Insulation and Sealing of System Components	643	248	149	$151	$1,117
	Process Heating (G) - Waste and/or Process Heat Recovery	2,311	214	172	$685	$1,975
	Process Heating (G) - Improved System Design and Controls	1,301	94	57	$87	$865
	HVAC - Heating - Insulation and Sealing of System Components	413	51	31	$69	$401
	HVAC - Heating - Waste and/or Process Heat Recovery	179	30	18	$54	$335
	HVAC - Heating - Improved System Design and Controls	227	23	14	$21	$226
	HVAC - Heating - Equipment Upgrades and Replacement	633	22	19	$20	$237
	HVAC - Heating - Improved Operations and Maintenance	116	8	5	$1	$33
Pulp and Paper Total		**71,973**	**6,934**	**4,379**	**$8,217**	**$54,476**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Food	Steam Production - Improved Operations and Maintenance	9,054	1,015	595	$373	$5,008
	Steam Production - Improved System Design and Controls	4,212	937	502	$1,435	$8,471
	Process Heating (G) - Improved Operations and Maintenance	9,132	746	517	$320	$4,250
	Steam Production - Waste and/or Process Heat Recovery	5,222	657	396	$646	$6,951
	Process Heating (G) - Insulation and Sealing of System Components	4,968	604	363	$272	$4,759
	Process Heating (G) - Equipment Upgrades and Replacement	10,152	308	245	$579	$2,827
	Steam Production - Equipment Upgrades and Replacement	7,030	250	195	$775	$2,750
	Process Heating (G) - Waste and/or Process Heat Recovery	2,392	226	182	$723	$2,087
	Steam Production - Insulation and Sealing of System Components	390	149	90	$91	$673
	Process Heating (G) - Improved System Design and Controls	1,093	81	49	$93	$688
	HVAC - Heating - Insulation and Sealing of System Components	524	65	39	$88	$509
	HVAC - Heating - Waste and/or Process Heat Recovery	228	39	23	$69	$425
	HVAC - Heating - Improved System Design and Controls	288	29	18	$27	$287
	HVAC - Heating - Equipment Upgrades and Replacement	804	28	24	$26	$301
	HVAC - Heating - Improved Operations and Maintenance	147	11	6	$1	$42
Food Total		**55,637**	**5,144**	**3,243**	**$5,517**	**$40,028**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Metals Primary	Process Heating (G) - Improved Operations and Maintenance	9,747	795	550	$341	$4,530
	Process Heating (G) - Insulation and Sealing of System Components	5,279	749	450	$521	$6,214
	Process Heating (G) - Improved System Design and Controls	3,822	412	259	$360	$4,261
	Process Heating (G) - Equipment Upgrades and Replacement	5,504	204	159	$347	$1,848
	Process Heating (G) - Waste and/or Process Heat Recovery	4,358	195	147	$91	$1,532
	Steam Production - Improved Operations and Maintenance	957	107	63	$37	$530
	Steam Production - Improved System Design and Controls	445	99	53	$152	$898
	HVAC - Heating - Insulation and Sealing of System Components	257	32	19	$43	$249
	Steam Production - Equipment Upgrades and Replacement	743	26	21	$82	$292
	Steam Production - Waste and/or Process Heat Recovery	552	24	19	$31	$253
	HVAC - Heating - Waste and/or Process Heat Recovery	112	19	11	$34	$208
	Steam Production - Insulation and Sealing of System Components	41	16	10	$10	$71
	HVAC - Heating - Improved System Design and Controls	141	14	9	$13	$141
	HVAC - Heating - Equipment Upgrades and Replacement	394	14	12	$13	$148
	HVAC - Heating - Improved Operations and Maintenance	72	5	3	$1	$21
Metals Primary Total		**32,424**	**2,711**	**1,785**	**$2,075**	**$21,197**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Fabricated Metals	Process Heating (G) - Improved Operations and Maintenance	6,014	463	320	$199	$2,639
	Process Heating (G) - Waste and/or Process Heat Recovery	1,899	140	113	$451	$1,298
	HVAC - Heating - Insulation and Sealing of System Components	597	74	44	$100	$579
	HVAC - Heating - Waste and/or Process Heat Recovery	259	44	26	$78	$484
	HVAC - Heating - Improved System Design and Controls	328	33	20	$30	$327
	HVAC - Heating - Equipment Upgrades and Replacement	916	32	28	$29	$343
	HVAC - Heating - Improved Operations and Maintenance	167	12	7	$2	$48
	Process Heating (G) - Equipment Upgrades and Replacement	0	0	0	$0	$0
	Steam Production - Insulation and Sealing of System Components	0	0	0	$0	$0
	Steam Production - Improved System Design and Controls	0	0	0	$0	$0
	Process Heating (G) - Improved System Design and Controls	0	0	0	$0	$0
	Steam Production - Improved Operations and Maintenance	0	0	0	$0	$0
	Process Heating (G) - Insulation and Sealing of System Components	0	0	0	$0	$0
	Steam Production - Equipment Upgrades and Replacement	0	0	0	$0	$0
	Steam Production - Waste and/or Process Heat Recovery	0	0	0	$0	$0
Fabricated Metals Total		**10,181**	**798**	**559**	**$889**	**$5,718**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Chemicals	Steam Production - Improved Operations and Maintenance	11,206	1,471	866	$895	$8,874
	Steam Production - Improved System Design and Controls	4,894	1,095	586	$1,679	$9,907
	Process Heating (G) - Improved Operations and Maintenance	9,172	745	516	$320	$4,246
	Process Heating (G) - Insulation and Sealing of System Components	4,263	522	314	$235	$4,113
	Process Heating (G) - Equipment Upgrades and Replacement	10,346	327	273	$665	$3,091
	Steam Production - Equipment Upgrades and Replacement	8,160	292	228	$906	$3,215
	Steam Production - Waste and/or Process Heat Recovery	6,096	264	210	$340	$2,798
	Process Heating (G) - Waste and/or Process Heat Recovery	2,428	225	182	$723	$2,086
	Steam Production - Insulation and Sealing of System Components	454	175	105	$107	$787
	Process Heating (G) - Improved System Design and Controls	1,308	95	57	$92	$860
	HVAC - Heating - Insulation and Sealing of System Components	161	20	12	$27	$157
	HVAC - Heating - Waste and/or Process Heat Recovery	70	12	7	$21	$131
	HVAC - Heating - Improved System Design and Controls	89	9	5	$8	$88
	HVAC - Heating - Equipment Upgrades and Replacement	248	9	8	$8	$93
	HVAC - Heating - Improved Operations and Maintenance	45	3	2	$0	$13
Chemicals Total		**58,939**	**5,265**	**3,371**	**$6,026**	**$40,458**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Machinery	Process Heating (G) - Improved Operations and Maintenance	2,131	166	115	$71	$944
	Steam Production - Improved Operations and Maintenance	717	81	47	$28	$398
	HVAC - Heating - Insulation and Sealing of System Components	640	79	47	$107	$621
	Steam Production - Improved System Design and Controls	334	74	40	$114	$673
	Process Heating (G) - Waste and/or Process Heat Recovery	653	50	40	$161	$464
	HVAC - Heating - Waste and/or Process Heat Recovery	278	47	28	$84	$520
	HVAC - Heating - Improved System Design and Controls	352	36	21	$33	$350
	HVAC - Heating - Equipment Upgrades and Replacement	983	34	30	$31	$368
	Steam Production - Equipment Upgrades and Replacement	557	20	15	$62	$219
	Steam Production - Waste and/or Process Heat Recovery	414	18	14	$23	$190
	Process Heating (G) - Equipment Upgrades and Replacement	478	16	15	$38	$162
	Process Heating (G) - Insulation and Sealing of System Components	125	16	9	$7	$124
	HVAC - Heating - Improved Operations and Maintenance	180	13	8	$2	$52
	Steam Production - Insulation and Sealing of System Components	31	12	7	$7	$53
	Process Heating (G) - Improved System Design and Controls	78	6	3	$4	$54
Machinery Total		**7,951**	**667**	**441**	**$772**	**$5,192**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Plastics and Rubber	Steam Production - Improved Operations and Maintenance	888	100	58	$35	$492
	Steam Production - Improved System Design and Controls	413	92	49	$141	$833
	Process Heating (G) - Improved Operations and Maintenance	943	74	51	$32	$423
	Steam Production - Equipment Upgrades and Replacement	689	25	19	$76	$271
	HVAC - Heating - Insulation and Sealing of System Components	191	24	14	$32	$186
	Process Heating (G) - Waste and/or Process Heat Recovery	276	22	18	$72	$208
	Steam Production - Waste and/or Process Heat Recovery	512	22	18	$29	$235
	Process Heating (G) - Equipment Upgrades and Replacement	536	18	17	$42	$181
	Process Heating (G) - Insulation and Sealing of System Components	140	18	11	$8	$139
	Steam Production - Insulation and Sealing of System Components	38	15	9	$9	$66
	HVAC - Heating - Waste and/or Process Heat Recovery	83	14	8	$25	$155
	HVAC - Heating - Improved System Design and Controls	105	11	6	$10	$105
	HVAC - Heating - Equipment Upgrades and Replacement	294	10	9	$9	$110
	Process Heating (G) - Improved System Design and Controls	87	6	4	$5	$61
	HVAC - Heating - Improved Operations and Maintenance	54	4	2	$1	$15
Plastics and Rubber Total		**5,249**	**454**	**294**	**$525**	**$3,480**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Transport Equipment	Process Heating (G) - Improved Operations and Maintenance	1,224	94	65	$40	$537
	Steam Production - Improved Operations and Maintenance	694	78	46	$27	$384
	Steam Production - Improved System Design and Controls	323	72	39	$110	$651
	HVAC - Heating - Insulation and Sealing of System Components	365	45	27	$61	$354
	Process Heating (G) - Waste and/or Process Heat Recovery	387	29	23	$92	$264
	HVAC - Heating - Waste and/or Process Heat Recovery	158	27	16	$48	$296
	HVAC - Heating - Improved System Design and Controls	201	20	12	$19	$200
	HVAC - Heating - Equipment Upgrades and Replacement	560	19	17	$18	$210
	Steam Production - Equipment Upgrades and Replacement	539	19	15	$60	$211
	Steam Production - Waste and/or Process Heat Recovery	400	17	14	$22	$184
	Steam Production - Insulation and Sealing of System Components	30	11	7	$7	$52
	HVAC - Heating - Improved Operations and Maintenance	102	7	4	$1	$29
	Process Heating (G) - Improved System Design and Controls	0	0	0	$0	$0
	Process Heating (G) - Equipment Upgrades and Replacement	0	0	0	$0	$0
	Process Heating (G) - Insulation and Sealing of System Components	0	0	0	$0	$0
Transport Equipment Total		**4,981**	**440**	**285**	**$505**	**$3,372**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Wood Products	Process Heating (G) - Improved Operations and Maintenance	1,363	107	74	$46	$611
	Steam Production - Improved Operations and Maintenance	535	60	35	$21	$296
	Steam Production - Improved System Design and Controls	249	55	30	$85	$502
	Process Heating (G) - Waste and/or Process Heat Recovery	398	32	26	$104	$301
	Process Heating (G) - Equipment Upgrades and Replacement	775	26	24	$61	$262
	Process Heating (G) - Insulation and Sealing of System Components	202	25	15	$11	$201
	Steam Production - Equipment Upgrades and Replacement	415	15	12	$46	$163
	Steam Production - Waste and/or Process Heat Recovery	309	13	11	$17	$142
	HVAC - Heating - Insulation and Sealing of System Components	108	13	8	$18	$104
	Process Heating (G) - Improved System Design and Controls	126	9	5	$7	$88
	Steam Production - Insulation and Sealing of System Components	23	9	5	$5	$40
	HVAC - Heating - Waste and/or Process Heat Recovery	47	8	5	$14	$87
	HVAC - Heating - Improved System Design and Controls	59	6	4	$5	$59
	HVAC - Heating - Equipment Upgrades and Replacement	165	6	5	$5	$62
	HVAC - Heating - Improved Operations and Maintenance	30	2	1	$0	$9
Wood Products Total		**4,804**	**388**	**260**	**$447**	**$2,926**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Beverage and Tobacco	Steam Production - Improved Operations and Maintenance	420	47	28	$16	$233
	Steam Production - Improved System Design and Controls	195	43	23	$67	$393
	Steam Production - Waste and/or Process Heat Recovery	242	30	18	$30	$323
	Steam Production - Equipment Upgrades and Replacement	326	12	9	$36	$128
	Process Heating (G) - Improved Operations and Maintenance	142	11	8	$5	$62
	Steam Production - Insulation and Sealing of System Components	18	7	4	$4	$31
	Process Heating (G) - Waste and/or Process Heat Recovery	45	3	3	$11	$31
	HVAC - Heating - Insulation and Sealing of System Components	24	3	2	$4	$23
	HVAC - Heating - Waste and/or Process Heat Recovery	10	2	1	$3	$20
	HVAC - Heating - Improved System Design and Controls	13	1	1	$1	$13
	HVAC - Heating - Equipment Upgrades and Replacement	37	1	1	$1	$14
	HVAC - Heating - Improved Operations and Maintenance	7	0	0	$0	$2
	Process Heating (G) - Equipment Upgrades and Replacement	0	0	0	$0	$0
	Process Heating (G) - Improved System Design and Controls	0	0	0	$0	$0
	Process Heating (G) - Insulation and Sealing of System Components	0	0	0	$0	$0
Beverage and Tobacco Total		**1,482**	**162**	**98**	**$178**	**$1,273**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
WWTF	Process Heating (G) - Improved Operations and Maintenance	2,159	166	115	$71	$948
	Steam Production - Improved Operations and Maintenance	1,177	132	77	$46	$652
	Steam Production - Improved System Design and Controls	547	122	65	$187	$1,104
	Process Heating (G) - Waste and/or Process Heat Recovery	683	50	41	$162	$466
	Steam Production - Equipment Upgrades and Replacement	914	33	25	$101	$359
	Steam Production - Waste and/or Process Heat Recovery	679	29	23	$38	$312
	Steam Production - Insulation and Sealing of System Components	51	19	12	$12	$88
	HVAC - Heating - Insulation and Sealing of System Components	98	12	7	$16	$95
	HVAC - Heating - Waste and/or Process Heat Recovery	42	7	4	$13	$79
	HVAC - Heating - Improved System Design and Controls	54	5	3	$5	$54
	HVAC - Heating - Equipment Upgrades and Replacement	150	5	5	$5	$56
	HVAC - Heating - Improved Operations and Maintenance	27	2	1	$0	$8
	Process Heating (G) - Insulation and Sealing of System Components	0	0	0	$0	$0
	Process Heating (G) - Improved System Design and Controls	0	0	0	$0	$0
	Process Heating (G) - Equipment Upgrades and Replacement	0	0	0	$0	$0
WWTF Total		**6,580**	**584**	**379**	**$657**	**$4,220**

Segment	Industrial Sector - Energy Efficiency Savings Category	Economic Potential (1,000 therms)	2012 Achievable Potential (1,000 therms)	2018 Achievable Potential (1,000 therms)	2012 Cost of Deployed Measures ($1,000)	2018 PV of Deployed Measures ($1,000)
Other	Process Heating (G) - Improved Operations and Maintenance	7,919	616	426	$264	$3,507
	Steam Production - Improved Operations and Maintenance	4,583	509	307	$205	$2,631
	Steam Production - Improved System Design and Controls	2,016	452	242	$692	$4,084
	Process Heating (G) - Waste and/or Process Heat Recovery	2,427	186	150	$599	$1,725
	Steam Production - Equipment Upgrades and Replacement	3,363	121	94	$374	$1,326
	Steam Production - Waste and/or Process Heat Recovery	2,510	109	86	$140	$1,153
	Steam Production - Insulation and Sealing of System Components	187	72	43	$44	$324
	Process Heating (G) - Equipment Upgrades and Replacement	1,778	61	55	$140	$602
	Process Heating (G) - Insulation and Sealing of System Components	464	58	35	$26	$461
	HVAC - Heating - Insulation and Sealing of System Components	362	45	27	$61	$351
	HVAC - Heating - Waste and/or Process Heat Recovery	157	27	16	$47	$294
	Process Heating (G) - Improved System Design and Controls	290	21	12	$15	$201
	HVAC - Heating - Improved System Design and Controls	199	20	12	$18	$198
	HVAC - Heating - Equipment Upgrades and Replacement	555	19	17	$18	$208
	HVAC - Heating - Improved Operations and Maintenance	102	7	4	$1	$29
Other Total		**26,912**	**2,322**	**1,526**	**$2,644**	**$17,095**
Grand Total		**287,112**	**25,869**	**16,620**	**$28,452**	**$199,434**

Agricultural Sector - Energy Efficiency Savings Category	Economic Potential (GWh)	2012 Achievable Potential (GWh)	2018 Achievable Potential (GWh)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Economic Potential (1000 therms)	2012 Achievable Potential (1000 therms)	2018 Achievable Potential (1000 therms)	2012 Cost of Deployed Measures ($1,000)	2012 PV of Deployed Measures ($1,000)
Dairy/Livestock Operation - Milking Parlor	211.04	19.23	12.71	2.20	1.45	-901	(37)	(37)	$6,351	$15,470
Dairy/Livestock Operation - Lighting	41.79	4.25	2.65	0.48	0.30	0	0	0	$821	$1,571
Dairy/Livestock Operation - Ventilation	15.25	0.66	0.39	0.07	0.04	0	0	0	$333	$546
Irrigation Systems - General	32.76	0.33	0.33	0.04	0.04	0	0	0	$306	$327
Grain Drying Operations - Process Improvements				-	-	2,158	169	102	$180	$748
Greenhouses - Shell Improvements				-	-	46	6	4	$7	$27
Greenhouses - Space Heating				-	-	1,518	121	73	$91	$534
Grand Total	**300.84**	**24.47**	**16.09**	**2.79**	**1.84**	**2,822**	**260**	**142**	**$8,090**	**$19,222**

APPENDIX E

SCENARIO ANALYSIS RESULTS

This Appendix presents the results of a number of scenarios that we ran using varying input assumptions. Please note that energy efficiency potential results reported in the body of the report have been scaled up to estimated 2012 baseline energy usage levels, based on historical energy consumption growth rates as reported in the *2008 Wisconsin Energy Statistics*. However, the results reported in this appendix represent output from the energy efficiency potential model, and thus have not been scaled up to estimated 2012 usage levels.

TABLE E-1: BASE SCENARIO

Sector	GWh	MW	Therms	Electric Efficiency Cost	Electric Efficiency Benefits (PV)	Natural Gas Efficiency Cost	Natural Gas Efficiency Benefits (PV)		Total Costs	Total Benefits (PV)	Net Benefits (PV)
Residential	218.71	32.3	3,520,614	$50,261,099	$85,464,146	$118,331,369	$136,688,034		$168,592,467	$222,152,180	$36,042,316
Commercial	469.07	136.48	10,263,172	$129,548,355	$558,329,684	$10,220,043	$61,156,846		$139,768,398	$619,486,531	$479,718,133
Industrial	409.25	58.62	25,869,000	$75,553,032	$275,556,751	$26,107,132	$185,392,198		$101,660,164	$460,948,949	$359,288,785
Agricultural	24.14	2.76	126,000	$7,595,501	$20,902,272	$278,338	$1,310,383		7,873,839	22,212,655	$14,338,816
Total	**1,121.17**	**230.16**	**39,778,786**	**$262,957,987**	**$940,252,853**	**$154,936,882**	**$384,547,461**		**$417,894,868**	**$1,324,800,315**	**$889,388,050**

TABLE E-2: SCENARIO 1 – LOWER DISCOUNT RATE: 2 PERCENT

Sector	GWh	MW	Therms	Electric Efficiency Cost	Electric Efficiency Benefits (PV)	Natural Gas Efficiency Cost	Natural Gas Efficiency Benefits (PV)		Total Costs	Total Benefits (PV)	Net Benefits (PV)
Residential	229.78	32.14	8,173,568	$72,473,553	$127,088,019	$196,068,276	$308,086,904		$268,541,829	$435,174,923	$166,633,094
Commercial	514.81	150.81	11,486,929	$160,136,488	$728,456,070	$18,630,129	$89,461,726		$178,766,617	$817,917,796	$639,151,179
Industrial	415.02	59.45	25,869,191	$80,367,554	$339,301,672	$28,453,686	$239,449,494		$108,821,240	$578,751,165	$469,929,926
Agricultural	24.66	2.82	305,203	$7,975,677	$22,147,001	$493,911	$1,644,190		$8,469,588	$23,791,191	$15,321,603
Total	**1,184.27**	**245.22**	**45,834,890**	**$320,953,272**	**$1,216,992,762**	**$243,646,002**	**$638,642,314**		**$564,599,274**	**$1,855,635,075**	**$1,291,035,802**

TABLE E-3: SCENARIO 2 – RELAXED TRC SCREEN: 0.75 OR GREATER

Sector	GWh	MW	Therms	Electric Efficiency Cost	Electric Efficiency Benefits (PV)	Natural Gas Efficiency Cost	Natural Gas Efficiency Benefits (PV)	Total Costs	Total Benefits (PV)	Net Benefits (PV)
Residential	237.51	33.09	7,654,746	$65,303,286	$98,267,857	$191,484,018	$201,622,024	$256,787,304	$299,889,880	$43,102,576
Commercial	521.78	153.35	11,728,824	$164,000,487	$609,651,521	$19,346,876	$76,096,678	$183,347,363	$685,748,198	$502,400,835
Industrial	417.74	59.84	26,076,635	$81,184,678	$279,958,270	$29,528,296	$201,633,715	$110,712,974	$481,591,984	$370,879,010
Agricultural	24.66	2.82	305,203	$7,975,677	$18,074,430	$493,911	$1,510,246	$8,469,588	$19,584,675	$11,115,088
Total	**1,201.69**	**249.10**	**45,765,408**	**$318,464,128**	**$1,005,952,078**	**$240,853,101**	**$480,862,663**	**$559,317,229**	**$1,486,814,737**	**$927,497,509**

TABLE E-4: SCENARIO 3 – INCREASED AVOIDED COSTS: $0.02/KWH & $0.25/THERM

Sector	GWh	MW	Therms	Electric Efficiency Cost	Electric Efficiency Benefits (PV)	Natural Gas Efficiency Cost	Natural Gas Efficiency Benefits (PV)	Total Costs	Total Benefits (PV)	Net Benefits (PV)
Residential	237.36	33.07	7,332,129	$65,009,881	$129,514,273	$187,326,524	$250,695,214	$252,336,405	$380,209,487	$127,873,082
Commercial	520.91	152.36	11,679,595	$162,078,017	$768,550,365	$19,289,485	$94,330,671	$181,367,502	$862,881,036	$681,513,534
Industrial	417.71	59.84	25,868,901	$81,166,430	$363,425,219	$28,451,853	$248,315,236	$109,618,283	$611,740,455	$502,122,172
Agricultural	24.14	2.76	259,603	$7,505,336	$14,664,414	$278,109	$1,207,063	$7,783,444	$15,871,477	$8,088,033
Total	**1,200.12**	**248.03**	**45,140,228**	**$315,759,664**	**$1,276,154,271**	**$235,345,971**	**$594,548,184**	**$551,105,634**	**$1,870,702,455**	**$1,319,596,821**

TABLE E-5: SCENARIO 4 – ENVIRONMENTAL SCENARIO (COMBINATION OF SCENARIOS 1-4)

Sector	GWh	MW	Therms	Electric Efficiency		Natural Gas Efficiency			Total Cost	Total Benefits (PV)	Net Benefits (PV)
				Cost	Benefits (PV)	Cost	Benefits (PV)				
Residential	254.43	36.44	10,075,158	$87,720,274	$188,190,494	$243,156,794	$463,032,580		$330,877,067	$651,223,074	$320,346,007
Commercial	565.72	172.70	13,844,157	$244,088,889	$1,059,957,203	$25,474,729	$128,401,296		$269,563,618	$1,188,358,499	$918,794,881
Industrial	479.22	68.74	26,076,924	$144,000,088	$528,361,246	$29,530,129	$301,528,156		$173,530,217	$829,889,402	$656,359,186
Agricultural	24.14	2.76	269,603	$7,505,336	$14,664,414	$278,109	$1,207,063		$7,783,444	$15,871,477	$8,088,033
Total	**1,323.51**	**280.64**	**50,265,843**	**$483,314,587**	**$1,791,173,357**	**$298,439,761**	**$894,169,095**		**$781,754,346**	**$2,685,342,452**	**$1,903,588,107**

TABLE E-6: SCENARIO 5 – OMISSION OF CARBON COST ADDER

Sector	GWh	MW	Therms	Electric Efficiency		Natural Gas Efficiency			Total Cost	Total Benefits (PV)	Net Benefits (PV)
				Cost	Benefits (PV)	Cost	Benefits (PV)				
Residential	156.34	19.01	2,405,815	$19,178,148	$31,342,711	$73,408,420	$85,643,085		$92,586,567	$116,985,796	$24,399,229
Commercial	405.73	119.96	9,794,441	$91,586,624	$378,183,374	$8,846,023	$48,327,748		$100,432,646	$426,511,122	$326,078,476
Industrial	359.82	51.45	25,504,495	$56,571,231	$168,318,074	$26,360,164	$161,032,808		$82,931,396	$329,350,882	$246,419,486
Agricultural	16.87	1.93	296,389	$4,309,741	$8,772,492	$278,109	$1,077,896		$4,587,849	$9,850,388	$5,262,538
Total	**938.76**	**192.35**	**38,001,140**	**$171,645,744**	**$586,616,651**	**$108,892,716**	**$296,081,537**		**$280,538,458**	**$882,698,188**	**$602,159,729**

Table E-7 presents the measures responsible for the majority of the increase in costs and savings between the Base Scenario and Environmental Scenario, by sector. The table presents the increase (Δ) in costs and savings under the Environmental Scenario as compared with the Base Scenario.

TABLE E-7: MEASURES RESPONSIBLE FOR MAJORITY OF INCREASED SAVINGS AND COSTS UNDER THE ENVIRONMENTAL SCENARIO (COMPARED WITH BASE SCENARIO)

Sector	Measure Category	Increase in 2012 Elec. Potential (GWh)	Increase in 2012 Gas Potential (1,000 therms)	Increase in 2012 Demand Reduction Potential (MW)	Increase in Total Resource Cost of Deployed Measures ($1,000)	Increase in Present Value of Benefits of Deployed Measures ($1,000)
Residential	Heating system fuel switch - electric to gas	32	(1,201)	0	$26,726	$44,056
Residential	Hot water demand recirculation	5	0	1	$13,982	$6,595
Residential	ENERGY STAR refrigerator/freezer	3	(60)	0	$2,363	$3,632
Residential	ENERGY STAR clothes washer (gas water heat & elec. dryer)	2	137	1	$1,864	$3,912
Residential	Shell upgrades during remodeling	1	1,438	2	$29,331	$51,680
Residential	Condensing water heater - natural gas (EF=0.80)	(0.310)	725	(0.040)	$8,818	$11,440
Residential	Shower controls	0	450	0	$3,751	$5,133
Residential	High efficiency water heater - natural gas (EF=0.67)	(0.350)	410	(0.050)	$5,059	$5,515
Commercial	Lighting equipment	46	(691)	8	$20,875	$59,250
Commercial	HVAC RCx / controls	14	1,637	13	$52,593	$147,299
Commercial	Refrig - cooler/freezer equip	10	0	2	$5,168	$22,712
Commercial	DHW system improvements	6	177	1	$3,580	$115,872
Commercial	Shell improvement	6	749	6	$26,981	$76,694
Commercial	Heat recovery	2	1,390	2	$10,083	$24,392
Commercial	Gas heating equip	0	308	0	$1,580	$9,810
Industrial	Lighting - equipment, controls and efficient layout/design	32	0	4	$31,765	$82,639
Industrial	Motors - system component improvement and replacement	28	0	5	$30,728	$54,672
Industrial	HVAC - variable speed drives and motor upgrades	5	0	1	$3,173	$4,400
Industrial	Process cooling - equipment upgrades and replacement	3	0	0	$893	$5,537
Industrial	Air compression - efficient system design and controls	1	0	0	$415	$2,127
Industrial	Process geating (gas) - waste and/or process heat recovery	0	122,286	0	$704	$7,390
Industrial	HVAC - heating - insulation and sealing of system components	0	68,661	0	$351	$3,275

Sector	Measure Category	Increase in 2012 Elec. Potential (GWh)	Increase in 2012 Gas Potential (1,000 therms)	Increase in 2012 Demand Reduction Potential (MW)	Increase in Total Resource Cost of Deployed Measures ($1,000)	Increase in Present Value of Benefits of Deployed Measures ($1,000)
Industrial	HVAC - heating - improved system design and controls	0	17,252	0	$101	$1,500
Agriculture	Dairy/livestock operation - manure management	0.19	0	0.02	$164	$262
Agriculture	Irrigation systems - trim pump impeller	0.02	0	0	$19	$253
Agriculture	Grain drying operations - process improvements	0	56.43	0	$323	$427
Agriculture	Greenhouses - space heating	0	53.14	0	$111	$425

APPENDIX F

ACEEE REPORT ON BEHAVIOR-BASED PROGRAM POTENTIAL IN WISCONSIN

Wisconsin Behavior Energy Response Continuum:
Extending Program Capacity to Deliver Energy Efficiency Benefits

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The American Council for an Energy-Efficient Economy (ACEEE) is a nonprofit research organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection. For more information, see http://www.aceee.org. ACEEE fulfills its mission by:

- Conducting in-depth technical and policy assessments
- Advising businesses, policymakers, and program managers
- Working collaboratively with businesses, public interest groups, and other organizations
- Organizing technical conferences and workshops
- Publishing books, conference proceedings, and reports
- Educating consumers and businesses

Projects are carried out by staff and selected energy efficiency experts from universities, national laboratories, and the private sector. Collaboration is the key to ACEEE's on-going success. We collaborate on projects and initiatives with dozens of organizations including international, federal, and state agencies as well as businesses, utilities, research institutions, and public interest groups.

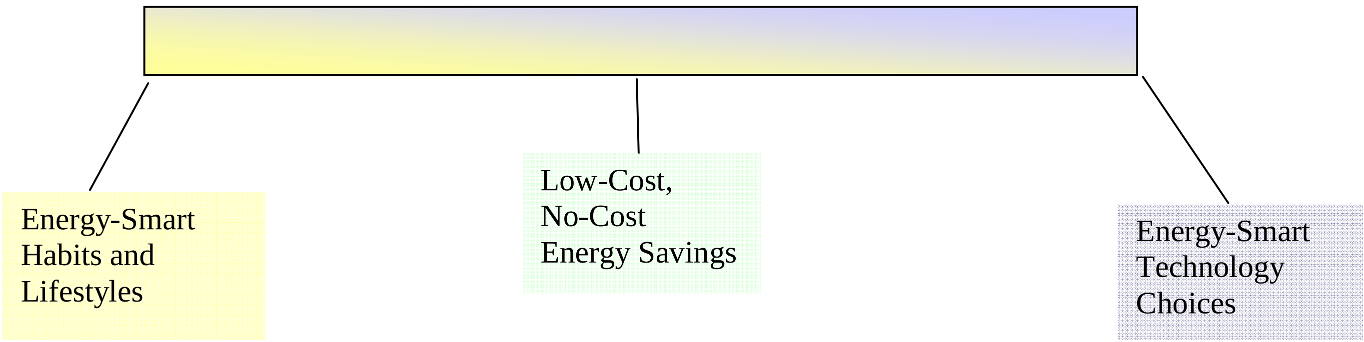
Support for our work comes from a broad range of foundations, governmental organizations, research institutes, utilities, and corporations.

Summary of findings

Behavior-oriented programs are a necessary complement to technology and/or incentive based programs in order to maximize both the potential and actual level of energy savings in Wisconsin.[9] By addressing individual habits, lifestyles, and technology choices, we estimate that Wisconsin's energy policies and programs could more than double projected residential sector energy savings opportunities. More specifically, estimates based on Wisconsin energy data indicate that behavior-oriented programs can reduce residential energy consumption in Wisconsin by as much as 18 percent or 38 trillion Btus by 2012. As such, a more comprehensive behavior program could result in savings that are more than twice as large as those associated with standard, technology-oriented approaches by generating a broader range of energy-smart behaviors, by eliciting a greater level of responsiveness among "traditional program" participants, and by driving a greater level of spillover among non-participants throughout Wisconsin.

More generally, our assessment highlights the potential expansion of energy savings in the residential sector through targeted efforts to address behavior change. This approach explores the level of potential savings along what we call a Behavior Energy Response Continuum. The Behavior Continuum ranges from habits and lifestyles on one end, to technology choices on the other. The middle of the Continuum includes a variety of infrequent, low-cost and no-cost behaviors that can reduce energy consumption including weather-stripping and caulking and insulating ducts or ensuring adequate space between the refrigerator and the wall. See Figure 1.

Figure 1 Behavior Energy Response Continuum



The use of the behavior continuum allows for the identification of different types of behavior-related energy savings and a more comprehensive estimate of behavior-related energy savings opportunities that properly recognizes the variety and scale of a wide range of savings opportunities. Importantly, the Behavior Continuum and the results from the associated analysis challenge traditional approaches to energy efficiency programs that tend to marginalize behavior-oriented programs by characterizing them as boutique or niche strategies that can only round out a technology-based deployment of more energy-productive investments. The application of the Behavior Continuum suggests the contrary; that behavior-

[9] Laitner, John "Skip"; Ehrhardt-Martinez, Karen; and Vanessa McKinney. 2009. " " Proceedings of the European Council for an Energy Efficient Economy Summer Study. Stockholm, Sweden: ECEEE.
Ehrhardt-Martinez, Karen. 2008. Behavior, Energy, and Climate Change: Policy Directions, Program Innovations, and Research Paths. (E087). Washington, DC: ACEEE.

related programs offer potential energy savings on a surprisingly large scale – one that rivals a pure technology based perspective in terms of expected efficiency gains.

The Wisconsin assessment 1) characterizes the elements included in the Behavior Continuum, 2) estimates the potential behavior-related energy savings for Wisconsin, and 3) compares the Behavior Continuum estimates to those provided via a more standard energy-efficiency potential study. It is important to note that due to our methods, our estimates of behavior-related energy savings are not strictly additive to the "traditional" energy-efficiency potential estimates. Because the Behavior Continuum includes technology choices, there is a measurable degree of overlap between the two types of estimates: those provided through the use of the Behavior Continuum and those provided through more traditional assessments. As such, the presentation of our findings also includes a comparison and discussion of the two different estimates of potential residential sector energy savings. We also include a write up of our methodology to provide additional clarification.

Behavior Continuum Measures

The Behavior Energy Response Continuum provides an expanded range of potential energy savings by assessing a broader spectrum of potential energy saving behaviors when compared to more standard approaches. The specific list of behavior-oriented items included in the Behavior Continuum for this study is provided in Table 1 (see attached). In all, 61 cost-effective measures were used to generate continuum-based residential energy savings estimates. This compares to the 55 measures that were considered as part of the standard approach (of which 24 were deemed to be cost-effective).

Approximately two-thirds of the 61 continuum-based measures are comprised of behavioral measures that tend toward the habits end of the continuum. We refer to these items as 'Energy-Smart Behaviors.' The remaining one-third of the continuum items are comprised of measures that tend toward the technology-choice end of the continuum. We refer to these items as 'Energy-Smart Technology Choices/ Investments'.[10] It is also important to keep in mind that the actual estimates of residential energy savings calculated for Wisconsin are, in large part, determined by the items included in the continuum. Finally, it is also important to note that these estimates represent a preliminary effort to further refine the Behavior Energy Response Continuum methodology. The ongoing development of the continuum will include the development of a more comprehensive list of potential energy-saving behaviors as well as other adjustments.

Continuum-based savings were estimated for seven different energy end uses, including: lighting, washers and dryers, refrigerators and freezers, space heating, water heating, air conditioning, and electronics. Table 2 provides information on the energy savings estimates associated with each end uses and summary information as to the relative mix of habit-related and technology-choice behaviors.

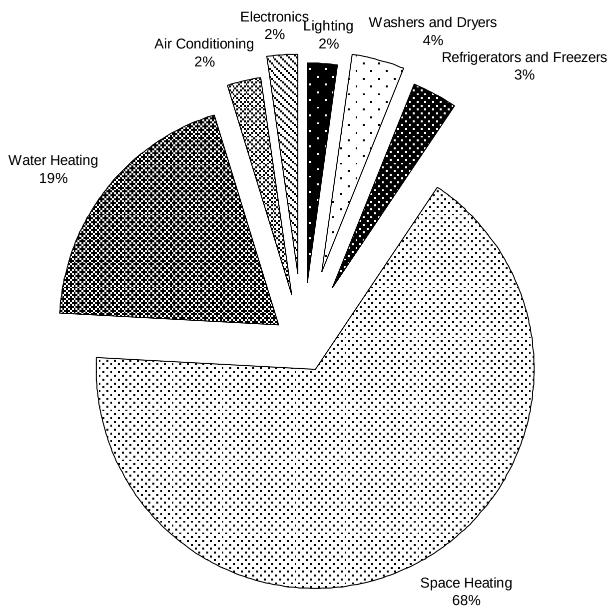
[10] We include technology choices and investment decisions in the behavior continuum because these reflect the human dimensions of technology-related energy savings. People must actively decide to invest in new energy-efficient technologies and actively adopt (purchase and properly install) these new technologies in order to achieve the potential savings that they offer. By recognizing the behavioral component of technology-related savings, we also recognize the many ways that these choices and behaviors can be influenced and that they are not simply a function of economic measures including product price and the availability of economic incentives such as rebates.

Table 2
Potential Residential Energy Savings by End Use

Energy End Use	Residential Energy Consumption (TBtu)	Potential Estimated Savings (TBtu)	% Energy-Smart Behavior	% Energy-Smart Technology Choices/ Investments
Lighting	4.99	0.24	100%	0%
Washers and Dryers	7.83	1.05	72%	28%
Refrigerators and Freezers	7.34	1.73	48%	52%
Space Heating	142.16	27.98	68%	32%
Water Heating	41.52	5.24	71%	29%
Air Conditioning	5.30	1.15	48%	52%
Electronics	4.57	1.11	35%	65%
TOTAL	**213.71**	**38.50**	**64%**	**36%**
Other	28.29			
TOTAL	242.00			

Wisconsin-Specific Behavior-Related Energy Savings Potential
The Continuum-based estimates suggest that by targeting a wider range of energy-smart behaviors, residential energy consumption could be reduced by as much as 18 percent or 38 trillion Btus by 2012. Figure 2 illustrates the proportion of potential behavior-related energy savings associated with each of the seven energy end use categories.

Figure 2: Potential Behavior-Related, Residential Sector Energy Savings by End Use



Comparison with Standard Assessment

The Continuum-based estimates suggest potential energy savings that are more than double those provided by the more traditional energy savings potential estimates. This higher level of savings is attributable, in general, to an expansion of the range of behavior-related items for consideration and, more specifically, to the inclusion of a wider range of low-cost or no-cost behavioral measures.

Behavior Continuum Methodology

The Continuum-based methodology uses 61 different measures of potential behavior-based or behavior-enabled energy savings that range from consumer choices to invest in and install new, energy-efficient equipment/technologies on the one hand, to everyday use decisions and habits such as switching off lights, washing in cold water, or turning down the thermostat on the other.

We begin by grouping the measures by energy end use such that each lighting-related measure is estimated separately and then all lighting-related estimates are summed. Once potential energy savings have been estimated for each of the seven end uses, end use estimates are summed to arrive at an estimate of total potential residential sector energy savings.

In order to generate potential savings estimates for each of the behavior-related measures, we begin with an estimated range of eligibility, an estimated range of the probability of adoption, and range of associated energy savings. The ranges are integrated into a Monte Carlo model that estimates the potential energy savings associated with each measure by developing random configurations of savings based on the specified ranges. The value for any particular measure is limited by the pre-specified range of eligibility (assigned by us as a function of DOE and EIA data on the topic), the probably participation (assigned by us as informed by the literature), and the pre-specified range of possible savings (assigned by us as a function of our research on the topic). Once these ranges have been specified and the end use energy consumption data are added, the model calculates numerous possible configurations using probability distribution functions as model inputs and arrives at an estimate of likely savings along with measures of upper and lower outcomes. Our estimates are based on average results from more than one thousand iterations.

We applied this method to the seven different energy end-use categories identified above: lighting, washers and dryers, refrigerators and freezers, space heating, water heating, air conditioning, and electronics.

Conclusions

Our estimates indicate that an end-use savings of 38 Trillion Btus could be achieved in the residential sector through the application of programs that are more specifically geared toward enabling better technology choices and smart-energy use habits, behaviors and lifestyles. Of the total potential savings, we estimate that roughly 36% are associated with enabling better technology choices, while 64 percent are potentially associated with low-cost and no-cost behaviors. (the upper and lower range was estimated at 47.6 and 32.8 trillion Btus, respectively).

Table 1:Comparison of Energy Saving Measures

	Behavior Continuum Measures	B/T	Standard Technology Choice Measures	Cost Effective?
Lighting	**1** Turning off lights when leaving a room (leaving a 60 W lightbulb on overnight	B	**1** CFL Bulbs, purchased replacement (2012)	Yes
	2 Replacing 85% of all incandescent light bulbs with equal CFL	B	**2** High Efficiency Lighting Fixtures	Yes
	3 Use a 15W CFL instead	B	**3** LED Bulbs, purchased replacement (2012)	Yes
			4 Common Area Lighting Improvements in Multifamily	No
			5 Exit Lighting Improvements in Multifamily	No
			6 Exterior Lighting Controls	Yes
			7 LED Exterior Lighting	No
			8 LED Holiday Lighting	No
Washers & Dryers	**1** Air-dry clothes during the warmest six month	B	**1** Dryer Fuel Switch	Yes*
	2 Replace a 2001 or older non-Energy Star dryer with a new Energy Star Unit	T	**2** Dryer With Moisture Sensor	Yes**
	3 Wash only Full loads in dishwashers and washing machines	B	**3** Heat Pump Clothes Dryer	No
	4 Use energy saving features on dishwashers, dryers, fridges and freezers	B	**4** Energy Star Clothes Washer (w/ Elec. WH & Elec. Dryer)	Yes
	5 Turn the water heater down to 120 from 140	B	**5** Energy Star Clothes Washer (w/ Elec. WH & NG Dryer)	Yes
	6 Wash clothes in cold water	B	**6** Efficient Electric Water Heater	Yes
	7 Buy front-load washer to replace top-load	T		

Table 1:Comparison of Energy Saving Measures

	Behavior Continuum Measures	B/T	Standard Technology Choice Measures	Cost Effective?
Refrigerators & Freezers	**1** Refrig 1 Replace old with new	T	**1** Energy Star Compliant Side-by-Side Refrigerator	No
	2 Refrig 1 Replace old with Energy Star	T	**2** Energy Star Compliant Top/Bottom-Freezer Refrigerator	No
	3 Refrig 1 Turn down thermostat	B	**3** Second Refrigerator Turn In	Yes
	4 Refrig 1 Other Mainenance	B	**4** Energy Star Compliant Chest Freezer	No
	5 Refrig 2 Replace old with new	T	**5** Energy Star Compliant Upright Freezer (Manual Def.)	No
	6 Refrig 2 Replace old with Energy Star	T	**6** Second Freezer Turn In	Yes
	7 Refrig 2 Turn down thermostat	B		
	8 Refrig 2 Other Maintenance	B		
	9 Refrig 2 Turn in or turn off	B		
	10 Freezer Replace old with new	T		
	11 Freezer Replace old with Energy Star	T		
	12 Freezer Other Mainence	B		
Space Heating	**1** Heat: Turn down thermostat from 72 to 68 during the day, and 65 at night	B	**1** Heating system fuel switch - Electric to Gas	No
	2 Install a programmable thermostat	B/T	**2** ECM Blower Retrofit for Furnace	No
	3 Heat: Install and upgrade attic insulation	B/T	**3** ECM Furnace	Yes
	4 Upgrade your 20 yr old furnace (AFUE 72) to condensing AFUE 90 unit	T		
	5 Heat: Install more efficient heating unit (92% efficient)	T		
	6 Heat: Replace poor windows with high-eff	T		
	7 Heat: caulk and weatherstrip	B		
	8 Install a ceiling fan	B/T		
	9 Use a humidifier	B		
	10 Use a chimney draft stopper	B		
	11 Seal cracks around windows, doors, and cables	B		
	12 Routine weatherstripping and caulk	B		
	13 Plug big gaps Plumbing stacks, furnace flues, stud cavities	B		
	14 Seal and insulate ducts in attic/crawl spaces, garages	B		

Table 1:Comparison of Energy Saving Measures

		Behavior Continuum Measures	B/T		Standard Technology Choice Measures	Cost Effective?
Water Heating	**1**	Turn down water heater from 140 to 120	B	**1**	Faucet aerator (3 per home)	Yes
	2	Install a EF 0.7 unit water heater	T	**2**	Heat Pump Water Heater	Yes
	3	Replace 10 yr old electric storage water heater (EF 0.9) with new Heat-pump storage unite (EF 2.20)	T	**3**	Hot Water Demand Recirculation	No
	4	Insulate your water heater (R-10 or greater)	B	**4**	Low Flow Showerhead	Yes
	5	Wrap pipes	B	**5**	New Construction, Improved Plumbing Design	Yes
	6	Install a low flow showerhead	B	**6**	Pipe Wrap	Yes
	7	Install a faucet aerator	B	**7**	Shower Controls (Shower Start Technology)	Yes
	8	Fix leaky faucets	B	**8**	Water Heater Blanket	Yes
				9	Water Heater fuel switch	No
				10	Drainwater Heat Recovery	No
				11	Efficient Electric Water Heater	Yes
Air Conditioning	**1**	Tune AC by measuring charge and air flow	B	**1**	2-Stage Central AC	No
	2	A/C: turn up thermostat from 73 to 78	B	**2**	CAC Tune-Up	No
	3	Install a programmable thermostat	B/T	**3**	Ceiling Fan Efficiency Upgrade	No
	4	A/C: Install and upgrade attic insulation	B	**4**	Cool Roof	No
	5	A/C Install a more efficient A/C SEER 13 or EER 12	T	**5**	Ductless mini-split Equipment Upgrade	No
	6	A/C: Replace poor windows with high-eff	T	**6**	Energy Star Room A/C	No
	7	A/C: caulk and weatherstrip	B	**7**	High Efficiency Central AC (Tier 1)	No
	8	Install radiant barriers or cool roofs in hot climates	B	**8**	High Efficiency Central AC (Tier 2)	No
	9	Clean A/C Filters and coils	B	**9**	Room A/C Turn In	Yes
	10	Install a ceiling fan	B	**10**	Whole House Fan	No
	11	Use a humidifier	B			
	12	Use a chimney draft stopper	B			
	13	Plug big gaps Plumbing stacks, furnace flues, stud cavities	B			

Table 1:Comparison of Energy Saving Measures

	Behavior Continuum Measures	B/T	Standard Technology Choice Measures	Cost Effective?
Cooking Appliances			**1** Convection Oven	No
			2 Induction Cooktop	No
			3 Range/Oven Fuel Switch	Yes
			4 Energy Star Dishwasher (Electric Water Heating)	Yes
Electronics	**1** Watch 25% fewer hours of TV	B	**1** Energy Star Compliant Personal Computer	Yes
	2 Purchase a projection HD TV instead of a plasma HD TV	T	**2** Home Electronics Efficiency Upgrade (Energy Star)	Yes
	3 Use a laptop instead of a desktop computer	T	**3** Smart Power Strip	No
	4 Use LED Christmas lights	T		
Dehumidifier			**1** Energy Star Dehumidifer	Yes
			2 New Construction, Sub-Slab Ventilation	No
Other			**1** Whole-house Electricity-Use Feedback Display Retrofit	Yes***
			2 Whole House Green Switch	No
TOTAL	**61**		**55**	**24**

*Cost effective in most instances.
**Cost Effective in single family and multi-family homes.
***Cost effective in single family homes only.

39 **Behavior Measures (64%)**
18 **Technology Measures (30%)**
4 **Behavior & Technology Measures (7%)**
61

APPENDIX G

ANALYSIS OF NEIGHBORHOOD-BASED PLUG LOAD INITIATIVE

In Chapter EE-4 of the energy efficiency report, we included the results of our analysis of a hypothetical neighborhood-based initiative that would use behavioral techniques to address low-cost savings opportunities from plugged in appliances. This appendix explains the program concept, assumptions, and energy-saving calculations.

Program Concept

The neighborhood-based plug load initiative would send trained "plug load specialists" into communities to offer immediate appliance audits for interested households. The plug load specialist would check the electric consumption of plugged in appliances at various power states (off, standby, active) throughout the household, and leave the household with a set of recommended actions for saving energy. The plug load specialist would also leave behind generic information sheets with the participating households to share with friends and neighbors and potentially also yard signs to generate interest and momentum in the community. The plug load specialist would leave behind information at relevant community sites as well, such as libraries, grocery stores, and community centers. All materials developed for this program would be designed specifically to achieve behavior change based on social norm comparisons and viral marketing.

Energy Saving Opportunities

Based primarily on qualitative insights from relevant studies in Wisconsin and Minnesota, we believe that households participating in such appliance audits would obtain low-cost, easy-to-implement energy savings from the following measures:

- Consolidating supplemental refrigerator and freezer space.
- Enabling computer power management settings.
- Using the on/off switch on existing power strips for a major "hub" of plugged in devices, such as an entertainment center.
- Unplugging selected individual devices with high electricity usage while turned off.

Energy Saving Calculations

The energy savings estimates presented in Chapter EE-4 are based on the following assumptions:

- 10 appliance audits per neighborhood ("first order participants")
- 225 kWh annually per first order household
- 30 other homes in each visited neighborhood would take some action as a result of viral marketing efforts ("second order households")
- 100 kWh annual savings per second order household

For a plug load specialist visiting 70 neighborhoods per year, the total energy savings per specialist are:

- 225 kWh/yr/audit * 700 audits * 100 kWh/yr/second-order hhld * 2,100 second-order hhlds = 367,500 kWh (per plug load specialist)

APPENDIX H

DELPHI QUESTIONNAIRES

Delphi Questionnaire for Energy Efficiency in Wisconsin's Residential Sector

The Residential Delphi questionnaire includes the technology markets listed below.

- If you have been asked to answer questions on specific markets, please complete the questions on those markets. You are welcome to answer questions on additional markets if you would like.
- If you have not been assigned to specific markets, please select at least three of the markets listed below and complete the questions on those markets.

Contents

- **Residential General Purpose Lighting**
- **Residential Retrofit Insulation and Air Sealing**
- **Residential HVAC Market**
  - **Electrically Efficient Furnaces**
  - **High Efficiency Central Air Conditioners**
  - **Other Technologies**
- **New Home Construction**
- **Residential Refrigeration**
- **Residential Clothes Washers**
- **Residential Water Heaters**
- **Multi-Family**
  - **Multi-Family Heating**
  - **Multi-Family Common Area Lighting**
- **Consumer Electronics**

This Delphi process is an important part of the 2009 Wisconsin efficiency potential study, and we greatly appreciate your thoughtful participation.

Delphi responses are due November 19, 2008. Please return your completed questionnaire via email to Karen Koski at the Energy Center of Wisconsin: kkoski@ecw.org.

If you have any questions, please contact Claire Cowan at the Energy Center of Wisconsin: ccowan@ecw.org or by phone at (608) 238-8276 x117.

Residential General Purpose Lighting

Background

- 77% of WI households currently have at least one CFL installed.
- The average number of (self-reported) CFLs installed in WI homes with at least one CFL is 9.7
- CFLs are currently estimated to be present in about 15% of all WI CFL-eligible sockets, which are thought to average about 50 per home.
- Nationally, CFL sales doubled between 2006 and 2007, and now account for about 20% of the light bulb market.
- Annual CFL sales in WI are estimated to have increased from 3.5 million in 2005 to 8.3 million in 2007, a 130% increase.
- Much of the growth in CFL sales (in WI and nationally) has come from Wal-Mart and big-box home improvement stores, which began aggressively promoting CFLs about three years ago. Annual WI sales at Wal-Mart---which does not participate in the Focus on Energy residential lighting program---have increased from 1.1 million in 2005 to 3.3 million in 2007.
- About 17% of the 8.3 million bulbs sold in WI in 2007 were rewarded through Focus on Energy; these were mostly for sales through home improvement outlets (57%) and hardware stores (34%).
- The Focus evaluation team estimates that Focus on Energy has a strong impact on sales in participating hardware stores, but much less impact on sales among home improvement outlets. Overall, it is estimated that about 25% of rewarded bulbs would have been sold anyway, a proportion that has increased over the last two years due to the aggressive sales efforts among home improvement stores.
- Between 2012 and 2014, new federal efficiency standards will be phased in that will require 25 to 30 percent better efficiency than today's incandescent bulbs: the phase-in starts with 100-Watt bulbs in 2012 and ends with 40-Watt bulbs in 2014. By 2020, light bulbs must be 60% more efficient than today's incandescents (a threshold that CFLs already meet).
- According to the American Council for an Energy Efficient Economy's summary of the new standards "the initial targets can be met by advanced incandescent lamps which the major manufacturers are introducing to the market, CFLs and LEDs. CFLs and LEDs will also meet the longer-term targets and, based on industry statements, so will at least one incandescent technology."

Questions

1. **In your opinion, what is the most effective way to increase the market share for efficient light bulbs in Wisconsin?**

2. **What are your estimates (by program scenario and time period) for the following lighting technologies in Wisconsin homes?**

   - High efficiency incandescents (including halogen)
   - CFLs
   - LED lighting

	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
Year	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A				N/A	N/A	N/A
2012 (in four years)									
2018 (in ten years)									

3. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	2	3	4	Expert 5

4. **Is there anything else we should know about this market or why you provided the responses above?**

Residential Retrofit Insulation and Air Sealing

Background

- There are currently about 1.4 million single-family, owner-occupied homes in Wisconsin, of which about one million were built prior to the adoption of Wisconsin's first energy codes in the late 1970s.

- A 1999 field study of Wisconsin homes indicated that:
    - 15 percent of Wisconsin homes did not have wall insulation,
    - 20 percent had ceilings insulated to R-11 or less
    - 20 percent had excessive air leakage (>0.5 air changes per hour)
    - Insulation and air sealing deficiencies were much more common among homes built prior to 1960
    - Homeowners were often unaware or misinformed about the adequacy of insulation in their homes

- About 10 percent of homes are remodeled in any given year in Wisconsin, though many of these remodels involve bathrooms and kitchens and do not affect the building shell.

- The Focus on Energy Home Performance with ENERGY STAR® program provides rewards for insulation and air sealing efforts in existing homes. The program works with a network of private home-performance consultants, some of whom work directly with remodelers and contractors. The program provided energy evaluation to about 2,400 households and rewards for installed shell measures to about 1,000 homeowners in the year ending in June 2008.

Questions

5. **In your opinion, what is the most effective way to stimulate homeowners to correct insulation and air sealing deficiencies in single-family homes?**

6. **In 2008, what percent of single-family owner-occupied homes would you say…**

   a. …have uninsulated walls? _____
   b. …have inadequately insulated ceilings? _____
   c. …have excessive air leakage? _____
   d. …have any significant shell deficiency? _____

7. **What are your estimates (by program scenario and time period) of the percent of Wisconsin single-family homes that have a significant insulation or air leakage shell deficiency?**

	% of WI single-family homes built prior to 2008 with one or more significant shell deficiencies		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

8. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	**2**	**3**	**4**	**Expert 5**

9. **Is there anything else we should know about this market or why you provided the responses above?**

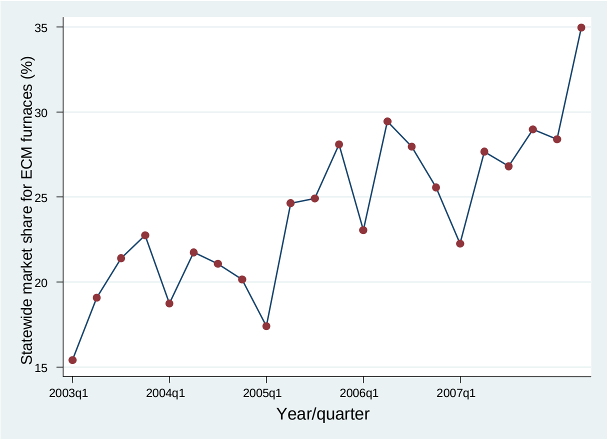
Residential HVAC Market

Background and questions for the residential HVAC market are divided into the following topic areas:

- Electrically efficient furnaces
- High efficiency central air conditioners
- Other technologies

Electrically Efficient Furnaces

Background



Electrically efficient furnaces (also known as variable-speed, or ECM furnaces) have been shown to use about half the electricity of a conventional furnace when the blower is operated in "auto" mode, and significantly less electricity in households that operate the furnace blower continuously part or all of the year.

These furnaces have been eligible for Focus on Energy rewards since 2002, and currently command 25 to 30 percent market share (see figure). Focus on Energy estimates that an ECM furnaces carries about a $650 price premium over a conventional high efficiency furnace.

Research by the Focus on Energy evaluation team suggests that a significant minority of households that purchase an electrically-efficient furnace switch from auto-fan operation to continuous-fan operation—often based on the recommendation of the installing contractor. These behavior changes have the effect of reducing the net average program savings.

Questions

10. Is the current cash-reward approach the most effective way to increasing the penetration of electrically-efficient furnaces in Wisconsin? If not, what would you recommend?

11. What are your estimates (by program scenario and time period) of the market share for electrically efficient furnaces?

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)			
2018 (in ten years)			

12. Which of the following best represents your view of the ability of state- or utility-funded efforts to mitigate the take-back of electricity savings that arises from consumers switching to continuous-fan operation?

a. **There is little that programs can do about this issue.**
b. **Programs could have some effect on fan operation practices.**
c. **Programs could have a major impact on fan operation practices**

13. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

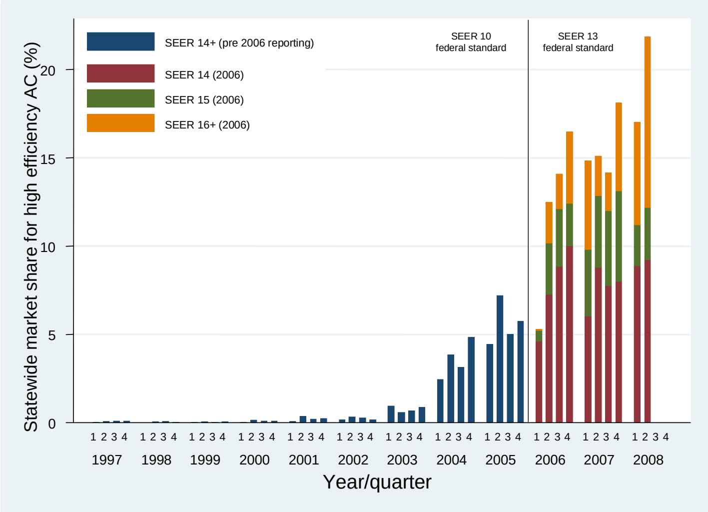
14. Is there anything else we should know about this market or why you provided the responses above?

High Efficiency Central Air Conditioners

Background

Focus on Energy has provided rewards on high efficiency air conditioners since 2002. Up until 2006 when the new federal SEER 13 standard took effect, SEER 13 systems were eligible for a reward. Between 2006 and 2007, SEER 14+ system were eligible for Focus on Energy rewards. Starting in 2008, only SEER 15+ can receive a Focus on Energy reward, and only if installed with an electrically-efficient furnace. Focus on Energy estimates that a SEER 15 air conditioner carries about a $700 price premium over a SEER 13 model.

The market share for SEER 14+ systems has increased to 15 to 20 percent in recent years (see figure).



A recent monitoring study indicates that the average Wisconsin central AC system is operated about 300 hours per year. For a typical 2.5-ton, SEER 13 system, that would translate into about 700 kWh of electricity use per season.

Questions

15. Are cash rewards the most effective way to increase the penetration of high-efficiency air conditioners in Wisconsin? If not, what do you suggest?

16. What are your estimates (by program scenario and time period) of the market share for SEER 14 and SEER 15+ air conditioners in Wisconsin?

Year	% of WI central AC market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)						
2018 (in ten years)						

17. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

18. Is there anything else we should know about this market or why you provided the responses above?

Other Technologies

Background

Ductless, mini-split systems

Ductless, mini-split systems obviate the need to ductwork for air conditioning (and heating): they employ a single outdoor unit with refrigerant lines serving multiple indoor, wall-mounted units that distribute conditioned air to individual zones. These systems have only about a 3% market share in North America, but make up about 50% of the worldwide market. They typically have much higher SEER ratings than conventional systems due to advanced compressor controls and better design. Ductless, mini-splits are eligible for rewards under Focus on Energy.

Dual-fuel heat pumps

Dual-fuel heat pumps provide an alternative heating source in place of a standard central air conditioner / furnace combination. In hot weather and under mild heating conditions, the heat pump meets the space conditioning needs of the home; during very cold weather, the gas furnace takes over to provide heating. Over the past several years, in response to high natural gas prices some HVAC distributors have been aggressively promoting these heat pumps as alternatives to purchases of conventional central AC systems.

Cold-climate heat pumps

Conventional air-source heat pumps must switch to expensive electric resistance back-up in cold weather, which makes them unattractive in Wisconsin's cold climate. However, cold-climate air-source heat pumps that can maintain efficiency in the coldest weather are now being introduced by smaller manufacturers. The cost of these heat pumps appears to be somewhere between that of a conventional furnace/AC system and a ground-source heat pump system.

Ground-Source heat pumps

Ground-source heat pumps pump heat into and out of the earth to provide space heating and cooling. The relatively stable temperature of the ground improves the efficiency and capacity of the system compared to air-source heat pumps. However, the systems are fairly expensive to install due to the need to dig trenches or wells for the circulation loops. One recent study also suggested that in Wisconsin housing there are limited (or negative) greenhouse gas benefits for ground-source heat pumps compared to conventional high-efficiency gas and central AC systems.

Questions

19. Do you feel these technologies should be pursued by state- or utility-funded programs in Wisconsin?

Ductless mini-split systems? ___ Yes ___ No
Dual-fuel heat pumps? ___ Yes ___ No
Cold-climate heat pumps? ___ Yes ___ No
Ground-source heat pumps? ___ Yes ___ No

20. For the technologies that you indicated should be pursued by Wisconsin programs, what are your estimates (by program scenario and time period) of market share?

	% of WI Residential HVAC market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
Year	2008	2012	2018	2008	2012	2018	2008	2012	2018
Ductless mini-split	N/A						N/A		
Dual-fuel heat pump	N/A						N/A		
Cold-climate heat pump	N/A						N/A		
Ground-source heat pump	N/A						N/A		

21. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

22. Is there anything else we should know about this market or why you provided the responses above?

New Home Construction

Background

- About 20,000 to 25,000 new single-family homes are built in Wisconsin each year.

- The Focus on Energy Wisconsin ENERGY STAR Homes program certified about 1,600 homes for the year ending in June 2008. The program primarily targets building shell improvements.

- An evaluation of the ENERGY STAR Homes program in 2002 indicated that the average program home uses about 100 therms (10%) less natural gas annually compared to a typical non-program new home. The evaluation was inconclusive regarding electricity savings, but the program currently does not claim non-HVAC electricity savings.

Questions

23. How much do you think state- or utility-funded voluntary programs could realistically be expected to achieve in terms of reducing energy usage <u>in the average new home</u> for the following end-uses:

a. Space heating: _____% lower than typical new construction
b. Space cooling: _____%
c. Water heating: _____%
d. Lighting: _____%
e. Refrigeration: _____%
f. Other appliances: _____%

24. What do you think is the best way for voluntary programs to encourage efficient new home construction?

25. What are your estimates (by program scenario and time period) of the fraction of new Wisconsin homes built each year that are at least 10% more efficient in terms of space heating and cooling compared to current conventional construction practices?

	% of WI single-family homes that are at least 10% more efficient for space conditioning than current conventional construction		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

26. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

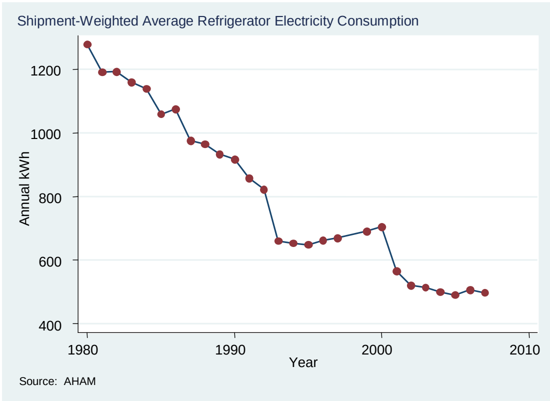
Novice 1	2	3	4	Expert 5

27. Is there anything else we should know about this market or why you provided the responses above?

Residential Refrigeration

Background

- Thanks to increases in federal standards, electricity consumption for new refrigerators has dropped dramatically in the last 15 years (see graph). Annual electricity use for all refrigerators and freezers in the average single-family Wisconsin home is estimated to have dropped from about 1,700 kWh/year in 1999 to about 1,250 in 2008 due to stock turn-over.



- As of April 2008, ENERGY STAR qualified refrigerators were required to be at least 20% more efficient than the current federal efficiency standard (10% for stand-alone freezers). The previous requirement was that an ENERGY STAR qualified refrigerator be 15% more efficient.

- In 2007, ENERGY STAR qualified refrigerators held a 30% national market share.

- Focus on Energy ended general consumer and retailer incentives for refrigerators in 2007, but works with retailers and trade groups to promote ENERGY STAR qualified units.

- In 1999, about one in five single-family homeowners had more than one refrigerator, and 60 percent had a stand-alone freezer.

Questions

28. What are your estimates for the market share for ENERGY STAR qualified refrigerators in Wisconsin?

	Market share (% of annual WI refrigerator sales that meet or exceed current ENERGY STAR criteria)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

29. Can state or utility-funded programs have a meaningful impact on the number of secondary refrigerators in Wisconsin homes? If so, how?

30. If you answered "yes" to the previous question, what are your estimates for the percent of Wisconsin single-family homes with secondary refrigerators under the following scenarios?

	% of WI single-family homes with secondary refrigerators		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

31. Similarly, can state or utility-funded programs have a meaningful impact on the number of stand-alone freezers in Wisconsin homes? If so, how?

32. If you answered "yes" to the previous question, what are your estimates for the percent of Wisconsin single-family homes with stand-alone freezers under the following scenarios?

	% of WI single-family homes with stand-alone freezers		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

33. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

34. Is there anything else we should know about this market or why you provided the responses above?

Residential Clothes Washers

Background

- The energy efficiency of clothes washer is denoted in terms of the Modified Energy Factor (MEF), which takes into account water heating requirements, machine electricity consumption, and the amount of moisture remaining in the load at the end of the wash cycle (which affects dryer energy consumption). The higher the MEF, the more efficient the washer.

- Federal standards for clothes washer efficiency increased in 2007 to an MEF of 1.26 (equivalent to an ENERGY STAR qualified unit in 2001).

- Concurrent with the increase in the federal standard, the ENERGY STAR qualification criterion for MEF was revised upward to 1.72, about 36% higher than the federal standard.

- The Consortium for Energy Efficiency also specifies energy efficiency tiers that many programs (including Focus on Energy) use as the basis for providing washer incentives. The three CEE tiers are:
  - Tier 1: MEF 1.80
  - Tier 2: MEF 2.00
  - Tier 3: MEF 2.20

- In March, the ENERGY STAR program announced that it would increase its minimum qualifying MEF criterion to 1.8 (CEE Tier 1) in July 2009 and to 2.0 (CEE Tier 2) in 2011.

- As of early 2008, ENERGY STAR estimated that 56% of available models met the current ENERGY STAR criteria, 51% met the CEE Tier 1 criteria, 33% met the CEE Tier 2 criteria and 15% met the CEE Tier 3 criteria.

- Prior to mid 2007, Focus on Energy provided incentives for ENERGY STAR qualified clothes washers. The program currently does not provide incentives for washers, but does work with retailers and trade groups to promote ENERGY STAR qualified units.

Questions

35. Can state or utility-funded programs have a meaningful impact on the market share for more efficient clothes washers in Wisconsin? If so, how?

36. If you answered "yes" to the previous question, what are your estimates for the market share for the following high efficiency clothes washer categories?

Year	% of Wisconsin residential clothes washer market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3
2008	N/A	N/A			N/A	N/A
2012 (in 4 years)						
2018 (in 10 years)						

37. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

38. Is there anything else we should know about this market or why you provided the responses above?

Residential Water Heaters

Background

- A 1999 field study indicated that between a quarter and a third of Wisconsin single-family homes have an electric water heater.

- In 2006, higher efficiency, power-vented gas storage water heaters represented about 7 percent of the US market for gas water heaters.

- Similarly, gas tankless water heaters represented about 5 percent of the US market for gas water heaters, but that market share is thought to be expanding rapidly.

- In the last 2 years, one major manufacturer (AO Smith) has introduced a residential condensing water heater (Vertex) that is targeted primarily at consumers with high hot water demand.

- Electric heat pump water heaters currently represent less than 0.1 percent of the electric water heater market, and are available only from small manufacturers with limit production capability. However, major manufacturers may introduce heat pump water heaters in response to coming ENERGY STAR labeling (see next item).

- In January 2009, ENERGY STAR will for the first time implement ENERGY STAR labeling for water heaters. Key qualifying criteria are as follows:
    - Qualified gas storage water heaters will have a minimum Energy Factor of 0.62 until August 2010, when the criterion will increase to 0.67.
    - Gas tankless water heaters will have to have an Energy Factor of 0.82 or higher.
    - Condensing gas storage water heaters will require an Energy Factor of 0.80 or higher.
    - Electric heat pump water heaters will require a minimum Energy Factor of 2.0.
    - Solar water heaters will require a minimum Solar Fraction of 0.50.
    - No electric resistance water heaters will be qualified under ENERGY STAR.

- Focus on Energy currently provides the following rewards for water heaters. Table below shows the reward levels and number of rewards paid during the most recent 15-month period:

Item	**Reward**	**# of rewards between July 2007 and October 2008**
Gas water heater with an EF between 0.64 and 0.79	$50	991
Gas tankless water heater with an EF of 0.80 or higher	$100	694
Condensing residential water heater	$150	63
Indirect water heater linked to a condensing boiler	$200	279
Electric to natural gas (or propane) fuel conversion	$250	312
Electric resistance with an EF of 0.93 or higher (not available for homes with natural gas service)	$50	73
Flue closure	$50	441

Questions

39. What are your estimates for the market share by program scenario for the following three gas water heater technologies?

- Conventional, power-vented storage water heaters with an EF between 0.62 and 0.70
- Whole-house, tankless water heaters with an EF of 0.80 or higher
- Condensing, storage water heaters with 90% thermal efficiency or higher.

Year	% of WI gas water heater market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	Conv. Power-vent	Tankless	Conden-sing	Conv. Power-vent	Tankless	Conden-sing	Conv. Power-vent	Tankless	Conden-sing
2008	N/A	N/A	N/A				N/A	N/A	N/A
2012 (in four years)									
2018 (in ten years)									

40. What are your estimates for the market share by program scenario and time period for the following two electric water heater technologies?

- Conventional storage water heaters with an EF of 0.93 or higher.
- Heat pump water heaters

Year	% of WI electric water heater market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	High EF conventional	Heat pump	High EF conventional	Heat pump	High EF conventional	Heat pump
2008	N/A	N/A			N/A	N/A
2012 (in four years)						
2018 (in ten years)						

41. Can State or utility-funded programs make a meaningful difference in the proportion of Wisconsin homes that have conventional electric water heaters? If so, how?

42. If you answered yes to the previous question, what are your estimates (by scenario and time period) of the proportion of Wisconsin homes with electric water heaters?

	% of WI single-family homes with electric water heaters		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

43. Do you forsee significant potential savings in Wisconsin from combined space and water heating technologies (such as condensing boilers with indirect water heaters) over the next 10 years?

44. If you answered yes to the previous question, what are your estimates (by scenario and time period) of the fraction of single-family Wisconsin homes with combined space and water heating systems?

	% of WI single-family homes with combined space and water heating systems		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

45. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

46. Is there anything else we should know about this market or why you provided the responses above?

Multi-family

The multi-family market consists of rental housing ranging from duplex to large apartment complexes. There are approximately 106,600 rental buildings in the state encompassing 486,800 housing units. Small buildings with fewer than five units account for approximately 90 percent of the buildings and more than 50 percent of the units.

The multi-family market has been a challenging one for energy efficiency programs because of:

- A split incentive, whereby those who pay for energy efficiency upgrades often do not benefit directly from lower energy bills;
- The distribution of a large share of rental units among small buildings;
- A large number of small-scale owners who control just a few units or buildings;
- A lack of strong and active apartment associations through which an energy program could offer its services; and
- A lack of demand for energy efficiency from tenants.

Background and questions for the residential HVAC market are divided into the following topic areas:

- Multi-family heating
- Multi-family common area lighting

Multi-family Heating Systems

Background

Heating systems for smaller buildings with 2-4 units are dominated by inefficient forced air furnaces with renters paying the cost of the heating fuel.

Most mid-sized and larger buildings use central boilers that heat and circulate water or steam with landlords paying the heating fuel.

Some buildings use in-unit electric resistance heaters.

Efficiency opportunities pursued by programs tend to include upgrades of inefficient furnaces to condensing models upon replacement and boiler replacements for inefficient systems – either as an early replacement or upon failure. There are some fuel-switching opportunities as well, for electric resistance heating systems.

Questions

47. **What program strategy do you think would provide the most effective approach to reduce total heating space energy for Wisconsin's multi-family buildings?**

48. What are your estimates of the market share for high efficiency condensing furnaces (AFUE >= 90%) among all furnaces installed in 2-4 unit buildings under the program scenarios and time periods listed below?

	Distribution of high efficiency furnaces in small multi-family (2-4 unit) buildings (% of all furnaces with an AFUE of 90% or higher))		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

49. What are your estimates of the market share for high efficiency condensing boilers among all boilers installed in multifamily buildings under the program scenarios and time periods listed below?

	Distribution of high efficiency boilers in multi-family buildings (% of all boilers that are condensing)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

50. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

51. Is there anything else we should know about this market or why you provided the responses above?

Multi-family Common Area Lighting

Background

Common area lighting provides one energy-saving opportunity in multi-family buildings. This lighting includes interior hallways, lobbies, laundry and storage rooms, and outdoor lighting. (Exit lights also fall into the common area lighting category, but we are excluding exit lights from this questionnaire.)

Efficiency levels for lights in these areas vary greatly, ranging from incandescent lightbulbs and comparatively inefficient T-12 fluorescent bulbs to compact fluorescent bulbs and comparatively efficient T-8 and T-5 fluorescent bulbs.

In addition, two new technologies are emerging as standard (inefficient) incandescent lightbulbs are phased out:

- Between 2012 and 2014, new federal efficiency standards will be phased in that will require 25 to 30 percent better efficiency than today's incandescent bulbs: the phase-in starts with 100-Watt bulbs in 2012 and ends with 40-Watt bulbs in 2014. By 2020, light bulbs must be 60% more efficient than today's incandescents (a threshold that CFLs already meet).

- Light-emitting diodes (LEDs) have been touted as the next lighting technology with varying estimates of when they will be market-ready.

Questions

What program strategy do you think would provide the most effective approach to reduce electric consumption for common area lighting in Wisconsin's multi-family buildings?

52. **Please complete the tables below to estimate the share of fixtures in multi-family buildings' common areas and outdoor fixtures using the following five lighting technologies in 2008, 2012, and 2018, under the three different program scenarios shown in the table:**
    - Inefficient incandescent lightbulbs
    - Efficient incandescent lightbulbs
    - T-12 fluorescent tubes
    - T-8 or T-5 fluorescent tubes
    - LEDs

Please note there are separate tables for 2-4 unit buildings and those with 5+ units. Please exclude exit lighting from your estimate.

	Distribution of lighting technology in small (2-4 unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures														
Year	**In the absence of state or utility programs**					**Under existing program approaches and funding**					**Under the most aggressive possible program approaches and funding**				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A										N/A				
2012 (in four years)															
2018 (in ten years)															

	Distribution of lighting technology in large (5+ unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures														
Year	**In the absence of state or utility programs**					**Under existing program approaches and funding**					**Under the most aggressive possible program approaches and funding**				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A										N/A				
2012 (in four years)															
2018 (in ten years)															

53. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

54. Is there anything else we should know about this market or why you provided the responses above?

Consumer Electronics

Background

Electricity usage in consumer electronics comprises a wide variety of types of appliances, which are thought to account for somewhat more than 10 percent of household consumption. Some considerations for your responses to our questions (partially drawn from a report commissioned by the Consumer Electronics Association[11]) include:

- Consumer electronics' share of household electricity consumption has been increasing.
- Computer- and television-related equipment comprises the majority of consumer electronics' energy consumption.
- Consumer electronics use electricity during active usage (about 70% of total consumption), as well as when they are off or in sleep settings.
- Active mode operating hours are increasing for computers and may be increasing for television sets.
- Nationally, program efforts to address consumer electronics have comprised promotion of the ENERGY STAR brand and stocking incentives for retailers that favor ENERGY STAR models.
- Focus on Energy does not provide incentives for consumer electronics, but outreach materials advocate purchasing ENERGY STAR qualified consumer electronics, and provide information about mitigating "phantom" load from electronics.
- California and several other states have established state-specific efficiency standards for equipment, which may have nationwide effects.
- Analog television broadcasts will cease in February 2008, thereby forcing owners of analog televisions who receive broadcasts through the airwaves to begin using a set-top converter box or upgrade to a digital television set.
- Market share for larger television sets is growing, as is market share for computers and gaming systems with increased processing power.
- Market share is also growing for Liquid Crystal Display (LCD) computer monitors that use less power than Cathode Ray Tube (CRT) technology.
- Market-leading computer manufacturers tend ship only or primarily ENERGY STAR qualified models with power-saving modes enabled.

Questions

55. **What program strategy do you think would provide the most effective approach to reduce residential electricity consumption by consumer electronics in Wisconsin?**

[11] See Roth, Kurt, and Kurtis McKenney, Energy Consumption by Consumer Electronics in U.S. Residences, TIAX LLC, Cambridge, MA, 2007.

56. Please complete the tables below to estimate future trends for the share of current residential electricity consumption in Wisconsin consumed by two major types of consumer electronics under the funding scenarios shown.

	Computer Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

	Television & Related Video Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

57. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

58. Is there anything else we should know about this market or why you provided the responses above?

Delphi Questionnaire for Energy Efficiency in Commercial and Institutional Facilities in Wisconsin

The Commercial/Institutional Delphi questionnaire includes the technology markets listed below.

- If you have been asked to answer questions on specific markets, please complete the questions on those markets. You are welcome to answer questions on additional markets if you would like.
- If you have not been assigned to specific markets, please select at least three of the markets listed below and complete the questions on those markets.

Contents:

- Packaged AC Systems
- Retrocommissioning
- Variable Speed Motors for HVAC/Refrigeration
- Lighting
- Lighting Controls
- Refrigeration

This Delphi process is an important part of the 2009 Wisconsin efficiency potential study, and we greatly appreciate your thoughtful participation.

Delphi responses are due November 19, 2008. Please return your completed questionnaire via email to Karen Koski at the Energy Center of Wisconsin: kkoski@ecw.org.

If you have any questions, please contact Claire Cowan at the Energy Center of Wisconsin: ccowan@ecw.org or by phone at (608) 238-8276 x117.

Commercial Packaged AC

Background

- In Wisconsin's census region, 67% of commercial (and institutional) floorspace is cooled using packaged air conditioning equipment (2003).
- Most (two-thirds) of this equipment is made up of rooftop units. Most commercial rooftop units sold have an EER greater than 10. And CEE Tier 3 equipment is also available with EERs greater than 12.
- However, most rooftop units currently installed have an EER of 9 or worse (2004).
- The Energy Policy Act of 2005 requires that after Jan. 1st, 2010, all new packaged AC units have an EER of at least 11.
- The annual replacement rate of existing rooftop units is about 7%.

Questions

1. **What are your estimates of the percentage of packaged AC systems sold (e.g. market share) for retrofits and new construction that exceed CEE Tier 3 efficiency levels (which are currently EER 12 but are likely to increase) under the program scenarios and time periods listed below?**

	Market share (% of annual sales exceeding CEE Tier 3)		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

2. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	**2**	**3**	**4**	**Expert 5**

Further Opinion (optional)

3. **In your opinion, what is the most effective way to increase the market penetration of energy-efficient packaged AC systems in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?**

4. **Is there anything else we should know about this market or why you provided the responses above?**

Retrocommissioning

Background

- Retrocommissioning (RCx) is a process of systematically optimizing the operation, control, and maintenance of building systems, including HVAC, plumbing, electrical, and lighting.
- Field results have shown that proper RCx can yield cost-effective energy savings of 5-20% with a typical payback of 2 years or less (2003).
- In a field survey of commercial buildings in the U.S., Lawrence Berkeley National Laboratory found that more than half suffered from control problems, and 40% had problems with HVAC equipment.
- Wisconsin's energy efficiency program, Focus on Energy, started a RCx pilot program in 2007 studying a limited number of buildings; it will slowly be disseminated to a larger audience over the next few years. Currently, very few commercial buildings in Wisconsin have completed RCx.
- RCx is primarily performed on larger buildings (50,000+ ft^2), which make up a little over 50% of the building space in Wisconsin (2003).

Questions

5. **What is your estimate of the cumulative percentage of commercial/institutional facilities that will have been retrocommissioned under the program scenarios and time periods listed below?**

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008*	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

*Only consider buildings that have been retrocomissioned within the last 5 years.

6. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	**2**	**3**	**4**	**Expert 5**

Further Opinion (optional)

7. **In your opinion, what is the most effective way to increase the rate of commercial/institutional buildings being retrocommissioned in Wisconsin?**

What are the key barriers (other than cost) preventing an increase in retrocommissioning activity?

8. **Is there anything else we should know about this market or why you provided the responses above?**

Variable-Speed Motors in Commercial HVAC/Refrigeration

Background

- Variable speed motor systems are commonly used in large, central HVAC systems that utilize variable air volume (VAV) distribution.
- These variable speed motors have recently become economical to use in chillers, cooling towers and fluid coolers, refrigeration systems, and pumps of all kinds. The initial cost is greater than standard motors, but for any system that runs at part-load for a significant period of time (which is true of most HVAC equipment), the payback is favorable.
- Focus on Energy offers incentives for any variable speed motor driving a blower or pump, but does not offer incentives for motors over 30 hp in new construction; variable speed motors are often chosen in this scenario anyway for their low operating cost.
- The new Energy Policy Act (2007) requires that all motors meet higher efficiency standards (today's Premium rating) by 2010, but there is still no federal requirement regarding variable speed motors.

Questions

9. **In commercial/institutional new construction, what are your estimates of the market share for variable speed HVAC motors under the program scenarios and time periods listed below?**

	% of HVAC motors in new commercial/institutional construction that are variable speed		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

10. **What are your estimates of the cumulative percentage of currently installed HVAC motors that will have been retrofitted with variable speed drives under the program scenarios and time periods listed below?**

	% of HVAC motors in existing commercial/institutional facilities retrofitted with variable speed drives		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			

2018 (in ten years)			

11. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

Further Opinion (optional)

12. In your opinion, what is the most effective way to increase the rate of penetration of variable speed motors in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

13. Is there anything else we should know about this market or why you provided the responses above?

Commercial Lighting

Background

- Lighting is the primary electric end-use in commercial (and institutional) buildings, accounting for almost half of total electrical consumption.
- The recent change in Wisconsin energy code mandates much more efficient lighting designs in commercial buildings, including a maximum of 1.0 W/ft^2 in office and similar building types.
- Most of the commercial floorspace in Wisconsin utilizes T8 lamp technology. In the United States, 56% of commercial floorspace utilizes T8s, and nearly 90% of new fluorescent installations involve T8 or better lighting (2005).
- A special designation of efficient T8s is a 'High Performance T8' (HPT8), defined by the CEE as using less than 32 W. A smaller percentage of T8 lights are HPT8s.
- As of a 2005 study, 44% of commercial incandescent-application fixtures had CFLs installed in them. This has likely increased significantly.
- LED lighting is considered to be the future of interior lighting, but has not made a significant impact on the market thus far.

Questions

14. In commercial/institutional <u>new construction,</u> what are your estimates of the market share for HPT8s under the program scenarios and time periods listed below?

	% of lighting in commercial/institutional <u>new construction</u> that is HPT8s		
	In the <u>absence</u> of state or utility programs	Under <u>existing</u> program approaches and funding	Under the <u>most aggressive possible</u> program approaches and funding
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

15. In commercial/institutional <u>new construction,</u> what are your estimates of the market share for LED lighting under the program scenarios and time periods listed below?

	% of lighting in commercial/institutional <u>new construction</u> that is LEDs		
	In the <u>absence</u> of state or utility programs	Under <u>existing</u> program approaches and funding	Under the <u>most aggressive possible</u> program approaches and funding
2008 (current market share)	N/A		N/A

2012 (in four years)			
2018 (in ten years)			

16. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting that will have been retrofitted to T8s or better (T5, HPT8, LED, etc.) under the program scenarios and time periods listed below?

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

17. What are your estimates of the cumulative percentage of currently installed commercial incandescent lighting fixtures that will have been retrofitted with CFLs under the program scenarios and time periods listed below?

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

18. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

Further Opinion (optional)

19. In your opinion, what is the most effective way to increase the rate of penetration of HPT8 and LED lighting in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

20. Is there anything else we should know about this market or why you provided the responses above?

Delphi Questionnaire for Energy Efficiency in Wisconsin Industrial Facilities

The Industrial Delphi questionnaire includes the technology markets listed below.

- If you have been asked to answer questions on specific markets, please complete the questions on those markets. You are welcome to answer questions on additional markets if you would like.
- If you have not been assigned to specific markets, please select at least three of the markets listed below and complete the questions on those markets.

Contents:

- **Motors**
- **Compressed Air**
- **Boilers and Steam Systems**
- **Pump Systems**
- **Lighting**
- **Manufacturing Processes**
- **Further Opinion (optional)**

This Delphi process is an important part of the 2009 Wisconsin efficiency potential study, and we greatly appreciate your thoughtful participation.

Delphi responses are due November 19, 2008. Please return your completed questionnaire via email to Karen Koski at the Energy Center of Wisconsin: kkoski@ecw.org.

If you have any questions, please contact Claire Cowan at the Energy Center of Wisconsin: ccowan@ecw.org or by phone at (608) 238-8276 x117.

Motors

Background

- The market for energy-efficient motors in the industrial sector is comprised of replacements of integral horsepower, polyphase, general purpose, low voltage AC, NEMA Design B induction motors at the time of failure with NEMA Premium® motors, and new motor purchases.
- The Energy Independence and Security Act of 2007 expanded the definition of "general purpose" motors and established new federal efficiency standards for motors manufactured after December 19, 2010. Key provisions include:
    - General purpose electric motors (subtype I) with a power rating between 1-200 hp shall have a nominal full-load efficiency that is not less than the level defined in NEMA MG-1 (2006) Table 12-12 (i.e., NEMA Premium efficiency levels).
    - General purpose electric motors (subtype II) with a power rating between 1-200 hp shall have a nominal full-load efficiency that is not less than the level defined in NEMA MG-1 (2006) Table 12-11 (i.e., EPAct '92 efficiency levels).
    - General purpose electric motors (NEMA Design B) with a power rating between 201-500 hp shall have a nominal full-load efficiency that is not less than the level defined in NEMA MG-1 (2006) Table 12-11**.**
    - Motors that fall within the Act's definition are now covered by the standard whether they are purchased alone or as a component of another piece of equipment.
- According to DOE's 1998 national assessment, motors over 200 hp account for only 1% of the U.S. manufacturing inventory, but account for 45% of motor energy use. At the time the assessment was conducted, approximately 80% of motors between 250-500 hp in the industrial inventory were pre-EPAct '92 models.[12]
- A 2004 survey of Wisconsin dealers found that the market share for NEMA Premium motors ranged from 21% to 46% for sales of motors 50 hp or smaller. Market share for motors larger than 50 hp was reported at 56%.[13]
- Motors 125 hp or larger are typically rewound at failure one or more times before replacement, and a 2005 study estimated that 3.9% of installed motors in this size category would be replaced every year. Since motors smaller than 125 hp will typically be replaced rather than rewound, the study estimated that 6.2% of motors in this category would be replaced every year.[14]

[12] U.S. Department of Energy's Office of Industrial Technologies and Oak Ridge National Laboratory (1998). *United States Industrial Electric Motor Systems Market Opportunities Assessment*. Prepared by Xenergy.
[13] KEMA, Inc. and Quantum Consulting (2005). *Focus on Energy Business Programs: Supply Chain Characterization and Baseline Study*.
[14] Energy Center of Wisconsin (2005). *Energy Efficiency and Customer-Sited Renewable Energy: Achievable Potential in Wisconsin 2006-2015*. Volume II, Technical Appendix. ECW Report Number 236-1.

Questions

1. **Of the current stock of motors installed in Wisconsin industrial facilities, what is your estimate of the percentage meeting NEMA Premium standards under the program scenarios and time periods listed below?**

	Installation of NEMA Premium motors (% of installed base)					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
Year	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)
2008 (current)	N/A	N/A			N/A	N/A
2012 (in four years)						
2018 (in ten years)						

2. **For the motor size categories listed below, please provide your estimate of typical rewind practices in the Wisconsin industrial market.**
   - **50-100 hp:**
     - **_____% rewound at failure**
     - **Rewound ___ times before replacement (on average)**
   - **101-200 hp:**
     - **_____% rewound at failure**
     - **Rewound ___ times before replacement (on average)**
   - **201-500 hp:**
     - **_____% rewound at failure**
     - **Rewound ___ times before replacement (on average)**

3. **In your view, would industrial facilities in Wisconsin benefit from additional energy efficiency program resources to support best practices for motor management/repair? If so, what kind of program resources/support would be most beneficial?**

4. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	2	3	4	Expert 5

5. **Is there anything else we should know about this market or why you provided the responses above?**

Compressed Air

Background

- This market is comprised of products and services for improving the performance of new and existing industrial compressed air systems. The market includes the prime mover and air compressor on the supply side of the system, and distribution piping, hoses, and uses on the demand side.
- A 2005 Wisconsin market assessment found that 50% of major manufacturers were reportedly promoting Compressed Air Challenge (CAC) best practices for compressed air systems, and growing end user awareness of the importance of a "systems approach" to compressed air management.[15]

Questions

6. **What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systems-based approach to managing compressed air systems? __________%**

7. **What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to compressed air systems under the program scenarios and time periods listed below?**

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)				
2012 (in four years)				
2018 (in ten years)				

[15] KEMA, Inc. and Quantum Consulting (2005). *Focus on Energy Business Programs: Supply Chain Characterization and Baseline Study*.

Scenario 3	**Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

8. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

9. Is there anything else we should know about this market or why you provided the responses above?

Boilers & Steam Systems

Background

- Wisconsin is one of the largest industrial boiler markets in the nation, with approximately 7 percent of the U.S. population of industrial boilers, for an installed base of around 3,500 industrial boilers.[16]
- The annual size of the Wisconsin industrial boiler market is around 100-250 units, most in the smaller size ranges. [17]
- According to DOE's Industrial Technologies Program, between 15 and 30% of installed steam traps may have failed in a system that hasn't been maintained in the last 3 to 5 years.[18]

Questions

10. What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systems-based approach to managing boilers and steam systems? __________%

11. What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to boilers and steam systems under the program scenarios and time periods listed below?

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

[16] Energy Center of Wisconsin with Quantum Consulting on behalf of the State of Wisconsin, Department of Administration, Division of Energy (2003). *Business Programs: Market Assessment. Commercial and Industrial Equipment Supply Chains: Industrial Boilers, Compressed Air Systems, and Pump Systems.*
[17] Energy Center of Wisconsin with Quantum Consulting on behalf of the State of Wisconsin, Department of Administration, Division of Energy (2003). *Business Programs: Market Assessment. Commercial and Industrial Equipment Supply Chains: Industrial Boilers, Compressed Air Systems, and Pump Systems.*
[18] U.S. Department of Energy, Industrial Technologies Program (2006). *Energy Tips – Steam. Steam Tip Sheet #1*.

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)				
2012 (in four years)				
2018 (in ten years)				

Scenario 3	**Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

12. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

13. Is there anything else we should know about this market or why you provided the responses above?

Pump Systems

Background

- This market includes currently available products and services that can improve the performance of new and existing industrial pump systems. Components include the prime mover and pump on the supply side of the system, and piping, valves, and end uses on the demand side.
- Studies have shown that 30-50% of the energy consumed by these systems could be saved through equipment or control system changes.
- A 2003 supplier survey found that around 15% of Wisconsin customers were requesting high efficiency pumping systems. [19]

Questions

14. **What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systems-based approach to managing pumping systems? __________%**

15. **What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to pump systems under the program scenarios and time periods listed below?**

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)			
2018 (in ten years)			

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)			
2012 (in four years)			
2018 (in ten years)			

[19] Energy Center of Wisconsin with Quantum Consulting on behalf of the State of Wisconsin, Department of Administration, Division of Energy (2003). *Business Programs: Market Assessment. Commercial and Industrial Equipment Supply Chains: Industrial Boilers, Compressed Air Systems, and Pump Systems.*

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)			
2018 (in ten years)			

16. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

17. Is there anything else we should know about this market or why you provided the responses above?

Lighting

Background

- A 2002 characterization of the U.S. lighting market reported that nationwide, the distribution of lighting in industrial facilities was 47% T8 fluorescent, 45% T12 fluorescent, 2% incandescent, 3% metal halide, 1% high pressure sodium, 1% mercury vapor, and 1% other fluorescent technologies.[20]
- A 2006 survey of lighting suppliers participating in Focus on Energy found that market share (including industrial and non-industrial applications) for high bay fluorescent fixtures in Wisconsin was 55%, an 8% increase over the previous year, and market share for high performance T8s was 21%, a 7% increase over the previous year.[21]

Questions

18. Of the current stock of light fixtures installed in Wisconsin industrial facilities, what is your estimate of the percentage that will have been replaced with energy-efficient technologies under the program scenarios and time periods listed below?

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)				
2012 (in four years)				
2018 (in ten years)				

[20] Navigant Consulting, Inc. for U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program (2002). *U.S. Lighting Market Characterization Volume I: National Lighting Inventory and Energy Consumption Estimate*.

[21] KEMA Inc and PA Consulting for State of Wisconsin, Department of Administration, Division of Energy (2006). *Focus on Energy Statewide Evaluation. Business Programs: Lighting and Motor/Drive Channel Market Effects Contract Metrics Assessment.*

Scenario 3	**Under the <u>most aggressive possible</u> state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)				
2018 (in ten years)				

19. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

20. Is there anything else we should know about this market or why you provided the responses above?

Manufacturing Processes

In addition to the energy-efficient technologies discussed above, there are numerous process-related opportunities for energy efficiency improvement which are industry-specific.

21. In your opinion, what are the greatest opportunities for process-related efficiency improvement for Wisconsin industrial facilities?

22. What is your estimate of adoption rates for process-related efficiency improvements under the program scenarios and time periods listed below? (Please list as many as are applicable).

a. Specify sector:____

b. Specify process-related improvement: ____________________________

	% of facilities in this sector that have adopted the process improvement listed above					
	In the absence of state or utility programs		**Under existing program approaches and funding**		**Under the most aggressive possible program approaches and funding**	
Year						
2008 (current)	**N/A**	**N/A**			**N/A**	**N/A**
2012 (in four years)						
2018 (in ten years)						

c. Specify sector:____

d. Specify process-related improvement: ____________________________

	% of facilities in this sector that have adopted the process improvement listed above					
	In the absence of state or utility programs		**Under existing program approaches and funding**		**Under the most aggressive possible program approaches and funding**	
Year						
2008 (current)	**N/A**	**N/A**			**N/A**	**N/A**
2012 (in four years)						
2018 (in ten years)						

e. Specify sector:____

f. Specify process-related improvement: __________________________

	% of facilities in this sector that have adopted the process improvement listed above					
	In the absence of state or utility programs		**Under existing program approaches and funding**		**Under the most aggressive possible program approaches and funding**	
Year						
2008 (current)	**N/A**	**N/A**			**N/A**	**N/A**
2012 (in four years)						
2018 (in ten years)						

23. What do you view as the most effective strategies for promoting process-related efficiency improvements in the industrial market?

24. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

25. Is there anything else we should know about this market or why you provided the responses above?

Further Opinion (optional)

26. In your opinion, what is the most effective way for program administrators to promote energy efficiency improvement in the industrial market?

27. Thinking 'outside of the box', are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in the industrial market?

28. Are there energy efficiency measures offering substantial opportunities for reducing industrial energy consumption that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?

29. What are the key barriers to broader adoption of energy-efficient technologies and practices in the industrial market?

30. Is there any additional information you would like to provide to inform estimates of achievable efficiency potential in the industrial market?

Delphi Questionnaire for Energy Efficiency in Wisconsin's Agriculture Sector

The Agricultural Delphi questionnaire addresses the markets listed below. Please answer the questions for your assigned markets, as shown in the email accompanying this survey -- Dairy Efficiency, Grain Drying Efficiency, or Efficiency in Sectors other than Dairy. You are welcome to answer questions for additional markets if you would like.

Contents:

Dairy

Background	
Q1	General
Q2-5	VSDs: Vacuum and Milk Pumps, Small versus Medium/Large Scale Operations
Q6-11	High Efficiency Ventilation Fans
Q12-17	Pre-Cooling, Refrigeration and Waste Heat Recovery
Q18-23	Dairy and Livestock Lighting
Q24-26	Parting Shots (Optional)

Grain Drying

Background	
Q27-29	Grain Dryers

Other Sectors

Q30	VSDs in Sectors Other than Dairy
Q31-Q33	Parting Shots (Optional)

References

This Delphi process is an important part of the 2009 Wisconsin efficiency potential study, and we greatly appreciate your thoughtful participation.

Delphi responses are due November 19, 2008. Please return your completed questionnaire via email to Karen Koski at the Energy Center of Wisconsin: kkoski@ecw.org.

If you have any questions, please contact Claire Cowan at the Energy Center of Wisconsin: ccowan@ecw.org or by phone at (608) 238-8276 x117.

Background – Wisconsin's Dairy Sector

- The dairy industry is thought to be the largest consumer of electricity within the Wisconsin's agricultural sector. Previous research estimates the dairy industry's share to be between 67 and 70 percent of the estimated 2,015 GWh of electricity consumed by agricultural type operations in 2005 (ACEEE, 2005; ECW, 2005).
- Between 2005 and 2007, small farms (100 cows or less) have seen average annual negative growth rates of between 4 and 6 percent. Conversely, large scale operations continue to make up a larger portion of Wisconsin's dairy farms with average growth rates of between 2.5 and 8 percent per year since 2005. Farms having 100 or more cows now produce over 60 percent of Wisconsin's milk (up from 32.5 percent in 1997).
- Trends toward agglomeration imply future investment in the expansion and construction of animal housing areas and milking parlors. Dairy operations in Wisconsin are becoming more specialized in milk production and increasingly automated. The increased use of automation and longer daily operating periods will continue to increase the demand for electricity.
- Widely practiced energy efficiency measures currently address several key areas: milk cooling, water heating (for cleaning and sanitation), milk pumping equipment, ventilation and lighting.
- A survey commissioned by Focus on Energy (KEMA, 2005) found the following trends among the state's dairy farms. Survey respondents indicated that:
  - Small operations rarely track their energy usage. When motors or pumps fail, farmers are mostly likely to go with dealer recommended replacement parts.
  - HVLS fans have an approx. 30-37 percent market penetration rate among small to medium sized operations.
  - In-line plate coolers are used to pre-cool milk on a large number of small (33 percent) and medium (54 percent) farms. Systems recovering heat from refrigeration to reduce water heating loads are widely used – 47 percent on small and 61 percent on medium operations. Variable speed drives (VSDs) on vacuum pumps are not widely used; only 18 percent of small farms and 32 percent of medium farms have them installed. In contrast, at the time of the survey, the majority of Focus grants (44 percent) funded projects having VSDs as the main energy saving measure.

Dairy - Current Incentive Programs

Focus on Energy provides incentive packages for qualifying farms in the following areas:

Dairy and Livestock Operations

- Milk pre-coolers ($750/u)
- Heat Recovery Tank with ($200/u) or without ($500) LP.
- VSDs for Vacuum Pumps ($750/u)
- Scroll Compressor ($250/u)
- High Efficiency Ventilation Fans ($2/blade inch) or HVLS fans ($1,500/u)

- Grants for implementing energy savings measures ‘in mass’ when designing and constructing automated milking parlors for farms exceeding 300 cows.

Several utilities offer some level of incentive for Wisconsin’s agricultural producers to implement energy saving measures. Some of these incentives include:

- Shared savings programs: Some utilities lend money to farmers to cover the up-front costs of implementing an energy efficiency project. Farmers pay back borrowed funds on a periodic basis in conjunction with monthly utility bills. In some cases, energy savings may equal or outweigh the monthly repayment amounts.

Dairy Industry – General

1. **Studies have attempted to approximate the distribution of electricity consumption by end use on Wisconsin's dairy farms. Please provide your estimate of future trends by listing the percentage share of electricity consumption by end use, present and future, for all dairy farms in Wisconsin, regardless of individual size. Please add additional categories under 'other' if needed. Each column representing a time period should sum to 100 percent.**

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration			
Vacuum/Milk Pumps			
Ventilation			
Interior Lighting			
Exterior Lighting			
Manure Management			
Other 1:			
Other 2:			
SUM:	100%	100%	100%

Comments:

Dairy Industry – VSDs:
Vacuum and Milk Pumps, Small versus Medium/Large Scale Operations

Questions

2. **In your opinion, what percentage of SMALL, MEDIUM and LARGE scale dairy farms will operate MILKING PARLORS over the time periods listed below? Consider both new construction and the addition of parlor-based milking systems by retrofitting existing structures.**

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)			
2012 (in four years)			
2018 (in ten years)			

3. **What are your estimates for the market share of variable speed drives (VSDs) used to power MILK and/or VACUUM PUMPS on Wisconsin's SMALL (100 or fewer milking cows) scale dairy operations under the program scenarios and time periods listed below?**

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

4. What are your estimates for the market share of variable speed drives (VSDs) used to power MILK and/or VACUUM PUMPS on Wisconsin's MEDIUM and LARGE scale dairy operations (over 100 milking cows) under the program scenarios and time periods listed below?

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

5. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

Dairy Industry – High Efficiency Ventilation Fans

6. Research shows that adding ventilation promotes a healthier living environment for milking cows and may therefore boost milk production. Please estimate current and future use of ventilation for each size class of farm, regardless of fan efficiency rating. Consider 'the use of' to encompass an adequate deployment of fans, such that the majority of housing floor space is ventilated.

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008			
2012 (in four years)			
2018 (in ten years)			

7. What are your estimates for the market share of High Volume Low Speed (HVLS) ventilation fans on Wisconsin's SMALL scale (100 or fewer milking cows) dairy operations under the program scenarios and time periods listed below?

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

8. What are your estimates for the market share of High Volume Low Speed (HVLS) ventilation fans on Wisconsin's MEDIUM and LARGE scale dairy operations (over 100 milking cows) under the program scenarios and time periods listed below?

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

9. What are your estimates for the market share of high efficiency (HE) ventilation fans (other than HVLS and at lest 21 CFM per watt efficiency rating) on dairy farms, regardless of size?

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

10. Regardless of the size of the operation, what percentage of farms routinely maintain ventilation fans (consider periodic maintenance to include cleaning shutters, checking belt tension, etc)?

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence			

11. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	**2**	**3**	**4**	**Expert 5**

Dairy Industry – Pre-Cooling, Refrigeration and Waste Heat Recovery

Questions

12. **What are your estimates of the use of inline well water pre-coolers on SMALL scale dairy operations (100 milking cows or less) under the program scenarios and time periods listed below?**

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

13. **What are your estimates of the use of inline well water pre-coolers on MEDIUM and LARGE scale dairy operations (100 milking cows or more) under the program scenarios and time periods listed below?**

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

14. What are your estimates of the use of WASTE HEAT RECOVERY FROM REFRIGERATION FOR HOT WATER HEATING on SMALL scale dairy operations (100 milking cows or less) under the program scenarios and time periods listed below?

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

15. What are your estimates of the use of WASTE HEAT RECOVERY FROM REFRIGERATION FOR HOT WATER HEATING on MEDIUM and LARGE scale dairy operations (100 milking cows or more) under the program scenarios and time periods listed below?

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

16. Regardless of the size of operation, what are your estimates of the use of SCROLL COMPRESSORS (in lieu of traditional reciprocating compressors) for milk refrigeration units under the program scenarios and time periods listed below?

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

17. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

Dairy and Livestock Industry – Lighting

A study completed by KEMA (KEMA, 2005) indicates the following trends are prevalent throughout Wisconsin's dairy sector:

- Incandescent lighting is used heavily for interior lighting on small (51%) and medium farms (45%).
- Indoor lighting controls are rarely used on small (8%) and medium (22%) farms.
- Long day lighting is often used on both small (32%) and medium (47%) farms.
- High pressure sodium vapor exterior lighting is used on less than 25 percent of all farms.
- Mercury vapor fixtures are still used extensively on both small (53%) and medium (42%) farms.

The Energy Independence Security Act of 2007 (EISA) may impact the rate of adoption of high efficiency lighting fixtures in dairy and other livestock operations. Specifically, EISA addresses the following lighting categories:

- Current general service incandescent light bulbs (with a lumen range of 310-2600) will be phased out between 2012-2014 and will be replaced with more efficient incandescent or halogen light bulbs, compact fluorescent light bulbs (CFL) or light emitting diode (LED) type lighting fixtures.
- 1992 EPAct standards for incandescent reflector lamps will be expanded to include lamps exceeding 2.25 (18/8) inches in diameter.
- Improvements in ballast efficiencies for all metal halide lamp fixtures, between 150 and 500 watts, manufactured on or after January 1, 2009.
- Visit the following site for a more comprehensive summary of EISA 2007: www.nema.org/gov/energy/upload/NEMA-Summary-and-Analysis-of-the-Energy-Independence-and-Security-Act-of-2007.pdf

Current Focus incentives address the following types of lighting:

- Replacement of T12 or T8 systems with low watt, 4' T8 linear fluorescent lighting systems.
- Replacement of 400 to 1000W high intensity discharge (HID) fixtures with lower wattage pulse-start metal halide (PSMH) or ceramic metal halide (CMH) lamps.
- Replacement of HID fixtures (between 250 and 1000W) with lower wattage, high bay fluorescent fixtures.
- Some incentives exist for long-day lighting systems.

Questions

18. **What are your estimates of the percentage of INTERIOR lighting on SMALL dairy operations that is supplied using high efficiency fluorescent lighting (such as CFLs) under the program scenarios and time periods listed below?**

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

19. **What are your estimates of the percentage of INTERIOR lighting on MEDIUM to LARGE scale dairy operations that is supplied using high efficiency fluorescent lighting (such as CFLs) under the program scenarios and time periods listed below?**

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

20. **What are your estimates of the percentage of EXTERIOR lighting on SMALL scale dairy operations that is supplied using high efficiency lighting (such as high pressure sodium or CFLs) under the program scenarios and time periods listed below?**

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

21. What are your estimates of the percentage of EXTERIOR lighting on MEDIUM to LARGE scale dairy operations that is supplied using high efficiency lighting (such as high pressure sodium or CFLs) under the program scenarios and time periods listed below?

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

22. What are your estimates of the percentage of farms using a long day lighting schedule in animal housing structures? Consider long day lighting to consist of <u>at least</u> 16 hours of light followed by 8 hours of darkness.

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008			
2012 (in four years)			
2018 (in ten years)			

23. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

Dairy Industry – Parting Shots (optional)

Questions

24. **Thinking 'outside of the box', are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in the dairy industry?**

25. **Are there energy efficiency measures offering substantial opportunities for reducing dairy energy consumption that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?**

26. **Are there future changes on the horizon that may present new energy challenges for dairy farmers in Wisconsin?**

Grain Drying

Although Wisconsin ranks only 9th in the nation for corn production, it is still considered a major grain producer. In fact, Wisconsin currently produces approximately 3.5 percent of the nation's corn (for grain). In 2007, approximately 4.1 million acres were planted producing 440 million bushels of corn. The table below shows 2007 grain production statistics for Wisconsin.

Crop	Acreage Harvested (1000 acres)	Production	Value
Corn For Grain	3,280	442,800 thousand bushels	$ 1,726,920,000
Soybeans	1,380	55,890 thousand bushels	$ 503,139,000
Wheat All	278	18,910 thousand bushels	$ 100,433,000
Oats	160	10,720 thousand bushels	$ 25,728,000
Barley All	23	1,311 thousand bushels	$ 3,540,000
Corn For Silage	745	11,920 thousand tons	$ -

The amount and type of drying equipment varies with the size of farming operation. The table below shows 2002 agricultural census information for farms growing corn, soybeans and wheat in Wisconsin.

	Corn		Soybean		Wheat	
Farm Size	Farms	BU/Farm	Farms	BU/Farm	Farms	BU/Farm
1.0 to 14.9 acres	5,198	888	1,948	376	1,331	481
15.0 to 24.9 acres	3,423	2,211	2,196	840	1,083	1,128
25.0 to 49.9 acres	6,422	4,392	3,799	1,553	1,257	2,011
50.0 to 99.9 acres	6,446	8,826	3,328	3,044	751	3,980
100.0 to 249.9 acres	5,103	19,503	2,593	6,497	318	8,511
250.0 to 499.9 acres	1,523	46,670	887	15,148	44	20,441
500.0 to 999.9 acres	644	95,215	368	28,753	17	41,724
1,000.0 acres or more	262	213,190	126	60,244	-	-
1,000.0 to 1,999.9 acres	220	179,441	111	53,518	-	-
2,000.0 to 2,999.9 acres	31	307,492	14	-	-	-
3,000.0 to 4,999.9 acres	9	-	1	-	-	-
5,000.0 acres or more	2	-	-	-	-	-

Conventional drying systems can be large consumers of natural gas. Several measures may be implemented to reduce the amount of energy required to dry grain (such as corn) for processing.

- **In-bin Cooling.** The goal in all grain drying operations is to reduce moisture levels to 15 or 16 percent. Grain can be removed from driers at slightly higher moisture levels (while hot) and moved directly to storage bins. Grain dries to optimal moisture levels while it cools in storage.
- **Dryeration.** Dryeration is similar to in-bin cooling in that grain is removed from dryers before the optimal moisture level is reached. Unlike in-storage drying, grain is moved to an intermediary cooling bin where it tempers for several hours before being moved to longer term storage.
- **Automated Controls.** The use of automated controls reduces the need for constant supervision and adjustment.

- **Heat recovery from dryers.** Heat recovery systems on dryers can reduce energy costs by 10 to 20 percent (Focus, 2007).

Types of Continuous Flow, Column Driers Considered.

Continuous Flow

- **Cross-Flow (CF) Column Dryers.** CF driers are perhaps the most common but most energy inefficient systems (Sanford, 2008). Heated air moves perpendicular to grain flowing down around a central plenum.
- **Concurrent-Flow Column Dryers.** This column drier sends heated air in the direction of grain flow. Although CCF driers are thought to be more energy efficient than conventional CF driers, costs associated with achieving higher drying temperatures may limit their degree of market penetration (Maier and Bakker-Arkema, 2002).
- **Counter-Flow Dryers.** This type of drier is the opposite of a CCF drying system. Heated air moves in the opposite direction of grain flow.
- **Mixed Flow Column Dryers.** MF driers are a composite of CF, CCF and counter-flow driers. Although MF driers are said to be widely used in Europe, their use is not prevalent in the United States.

Questions

27. **Little data exists concerning the quantity and type of grain dryers currently owned and operated in Wisconsin. The following questions are designed to help estimate the quantitative and qualitative characteristics of the market for grain drying equipment in Wisconsin.**

    g. In your opinion, what percentage of farms own grain drying equipment, with the remainder either drying grain in the field or transporting wet grain to a central grain handling facility?

Percent owning drying equipment	
Percent drying at a central handling facility	
Percent drying in the field/storage (no drying equip)	
Total	100%

    h. In your opinion, what percentage of grain dryers operating in Wisconsin could be described using the following 'flow' characteristics?

Continuous Flow – Column	
Batch Feed – Bin	
Automated Batch Feed – Bin	
Continuous Flow – Bin	
Other:	
Total	100%

    i. In your opinion, what percentage of grain dryers operating in Wisconsin could be described using the following 'temperature' characteristics?

High Temperature	
Low or Ambient Temperature	
Combination High/Low Temperature	
Total	100%

    j. In your opinion, what percentage of column dryers operating in Wisconsin are of the following type?

Cross Flow	
Mixed Flow	
Concurrent Flow	
Counter Flow	
Other: ___________________________	
Total	100%

    k. In your opinion, what percentage of In-bin dryers operating in Wisconsin are of the following type?

Low Temperature In-Bin	
High Temperature In-Bin	
Total	100%

28. Please estimate the current and future market penetration rates for the following grain drying technologies, regardless of the size of operation.

	Market share (% of grain drying operations possessing this technology.)		
Technology	**2008**	**2012**	**2018**
Automated Controls			
In-bin Cooling			
Dryeration			
Addition of a Stirring Mechanism			
High Efficiency Ventilation Fans			
Heat Recovery			
Other 1: ____________________________			
Other 2: ____________________________			
Total	100%	100%	100%

29. Cross flow driers are currently the most widely used column-type grain drying system. Mixed and concurrent flow column-type systems are said to be more energy efficient but are not yet widely used in the US. What is your estimation for current and future market penetration rates for mixed and concurrent flow column type driers?

	Market share (% column type driers possessing this technology.)		
	2008	**2012**	**2018**
Cross Flow			
Enhanced Cross Flow (Heat Recovery, Automated Controls, etc)			
Mixed Flow			
Concurrent Flow			
Counter Flow			
Total	100%	100%	100%

VSDs in Sectors Other than Dairy

Questions

30. What are your estimates for the market share of variable speed drive (VSDs) to power ventilation fans used in potato or other produce storage facilities under the program scenarios and time periods listed below?

	Market share (% of facilities using VSDs)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

Sectors Other than Dairy– Parting Shots (optional)

Questions

31. Thinking 'outside of the box', are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in Wisconsin's agriculture sector?

32. Are there energy efficiency measures offering substantial opportunities for reducing energy consumption within agriculture that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?

33. Are there future changes on the horizon that may present new energy challenges for farmers in Wisconsin?

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Commercial Lighting Controls

Background

- Lighting is the primary electric end-use in commercial (and institutional) buildings, accounting for almost half of total electrical consumption. Controlling the lights to be off when rooms are unoccupied or daylit can save as much (and often more) energy as using efficient fixtures.
- Wisconsin energy code mandates controls in several areas, including 1) separate manual controls for lights near windows and skylights, 2) manual controls required for reducing light levels by 50%, and 3) occupancy sensors or timers for most spaces.
- Automatic daylighting controls, which utilize photosensors, are still not mandated by state code. These systems are beginning to see a significant share of the market however, particularly in LEED buildings and schools.
- A large portion of the commercial floorspace in the state was built prior to the code requirements above, and does not have any of the controls discussed above. (Retrofit percentages are not available.)

Questions

21. In commercial/institutional new construction, what are your estimates of the market share for lighting systems that include automatic daylighting controls under the program scenarios and time periods listed below?

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

22. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting systems that will have been retrofitted with automatic daylighting controls under the program scenarios and time periods listed below?

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

23. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting that will have been retrofitted with occupancy sensors or timed controls under the program scenarios and time periods listed below?

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

24. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Novice 1	2	3	4	Expert 5

Further Opinion (optional)

25. In your opinion, what is the most effective way to increase the rate of penetration of lighting controls in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

26. Is there anything else we should know about this market or why you provided the responses above?

Commercial Refrigeration

Background

- Refrigeration accounts for 9% of commercial energy use; two thirds of commercial buildings have some type of refrigeration. 85% of this refrigeration usage is in the grocery and restaurant sectors.
- Packaged systems account for 2/3 of systems; built-up systems account for the other third.
- The average growth rate of refrigeration system energy consumption is 3%. Of existing systems, roughly 8% are replaced each year.
- Efficiency improvements to refrigeration systems can lower energy consumption by anywhere from 20-50%.
- A 2005 survey of Wisconsin contractors who service commercial buildings with refrigeration found that the following percentages of facilities had implemented the energy efficiency measures listed below:
    - Anti-sweat controls 65%
    - ECM evaporator fan motors 4%
    - High efficiency compressors 32%
    - Strip curtains on walk-ins 51%
    - Doors on cooler cases 47%
    - Ambient sub-cooling 53%

Questions

27. What are your estimates of the percentage of new refrigeration systems that include/will include ECM motors under the program scenarios and time periods listed below?

	% of new commercial refrigeration systems that include ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

28. What are your estimates of the percentage of new refrigeration systems that will include high efficiency compressors under the program scenarios and time periods listed below?

	% of new commercial refrigeration systems that include high efficiency compressors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

29. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will be retrofitted with ECM motors under the program scenarios and time periods listed below?

	% of existing commercial refrigeration equipment retrofitted with ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

30. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with high efficiency compressors under the program scenarios and time periods listed below?

	% of existing commercial refrigeration equipment retrofitted with high efficiency compressors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

31. **What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with anti-sweat controls, doors, or strip curtains under the program scenarios and time periods listed below?**

	% of existing commercial refrigeration equipment retrofitted with anti-sweat controls, doors, or strip curtains		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

32. **What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with ambient sub-cooling under the program scenarios and time periods listed below?**

	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A		N/A
2012 (in four years)			
2018 (in ten years)			

33. **On a scale of 1 to 5, how would you rate your level of expertise on this topic?**

Novice 1	2	3	4	Expert 5

Further Opinion (optional)

34. **In your opinion, what is the most effective way to increase the rate of penetration of refrigeration efficiency measures in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?**

35. **Is there anything else we should know about this market or why you provided the responses above?**

APPENDIX I

DELPHI RESPONSES

Residential Delphi Responses

Residential General Purpose Lighting

1. In your opinion, what is the most effective way to increase the market share for efficient light bulbs in Wisconsin?

Respondent 1: Working with retail outlets to carry a greater variety of CFLs and LED lights needs to continue. Working to implement legislation that taxes incandescents $.50 a bulb with the revenue going directly back to all Wisconsinites is another way to phase out inefficient lighting. The energy security rebate to everyone can then be expanded to other less desirable technologies or energy waste.

Respondent 2: Downplay the Mercury content in the CFLs and push the manufacturers of LEDs to come to market with useable, cost effective LEDs.

Respondent 3: Higher rebates on specialty bulbs: dimmable, 3-way, reflectors that meet PNL heat tolerance standards and/or the LED bulbs for recessed lights.

Respondent 4: Education and awareness activities. Price and supply do not seem to be problems any more.

Respondent 6: Annual short-term price buy-downs. Education and Advertising campaign to show improvements in bulbs, variety of types available today, proper installation (hold onto the base, not the tube), quality differences, Energy Star seal, bill savings, energy savings/green-ness. This is still a great deal of misunderstanding out there, especially among households with lower education and/or income. A CFL-for-incandescent swap as part of low income programs.

Respondent 7: Provide incentives for packets (3 or more) of specialty bulbs such as R20, R30, R40, PAR38, Globe, Torpedo, Cold Cathode CFLs, and Candelabra Base.

Respondent 9: For CFLs, focus increasingly on negotiated arrangements with manufacturers and retailers rather than on consumer rebates, and get increasingly demanding regarding evidence that incentive payments to each participating manufacturer and/or retailer are resulting in lift (increased sales). For CFLs, focus increasingly on specialty bulbs, which appear to be much less advanced on the diffusion curve than standard CFLs. Recognize that the market for CFLs is 80% transformed at this point, plan an exit strategy, and begin to focus on assisting in the commercialization of LEDs.

Respondent 10: Continue with Change-a-Light, and try to collaborate with the big box stores (e.g., Wal Mart) using more aggressive approaches and funding.

2. What are your estimates (by program scenario and time period) for the following lighting technologies in Wisconsin homes?

- High efficiency incandescents (including halogen)
- CFLs
- LED lighting

Respondent 1:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A		25	1	N/A	N/A	N/A
2012 (in four years)					50	20		50	35
2018 (in ten years)				10	50	40	5	15	80

Respondent 2:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A	10	40	1	N/A	N/A	N/A
2012 (in four years)	10	40	2.5	10	50	5	10	50	10
2018 (in ten years)	10	50	5	10	50	10	5	40	20

Respondent 4:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A	5	25	1	N/A	N/A	N/A
2012 (in four years)	45	35	15	45	40	15	40	45	20
2018 (in ten years)	15	25	60	30	10	60	10	10	80

Respondent 6:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A	0%	15%	0%	N/A	N/A	N/A
2012 (in four years)	1%	20%	1%	2%	25%	2%	3%	45%	3%
2018 (in ten years)	5%	25%	5%	10%	50%	10%	20%	60%	20%

Respondent 7:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A	<1%	10	<1%	N/A	N/A	N/A
2012 (in four years)	1	20	1%	2	20	2	5	40	5
2018 (in ten years)	3	30	5%	5	40	5	10	50	20

Respondent 9:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A	0	36%	0	N/A	N/A	N/A
2012 (in four years)	30	65	5	15	80	5	5	70	25
2018 (in ten years)	10	65	25	10	65	25	0	50	50

Respondent 10:

Year	% of WI residential general-purpose, medium-screwbase lighting market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED	High eff. incandescent	CFL	LED
2008	N/A	N/A	N/A				N/A	N/A	N/A
2012 (in four years)	5	25	15	10	30	20	20	40	30
2018 (in ten years)	10	30	20	15	35	25	30	50	40

3. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			4	

Respondent 2:

Novice 1	2	3	4	Expert 5
		x		

Respondent 3:

Novice 1	2	3	4	Expert 5
	x			

Respondent 4:

Novice 1	2	3	4	Expert 5
		3		

Respondent 6:

Novice 1	2	3	4	Expert 5
		x		

Respondent 7:

Novice 1	2	3	4	Expert 5
				X

Respondent 9:

Novice 1	2	3	4	Expert 5
			X	

Respondent 10:

Novice 1	2	3	4	Expert 5
			X	

4. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: LED lights are expected to come down in price significantly in the next two years. If so, this technology will overtake CFLs in the following years. Lighting will be added to the Uniform Dwelling Code at some point in the future. Program efforts that pave the way for this addition to the code could allow this to happen sooner.

Respondent 3: Forecasting future market share is not my area of expertise.

Respondent 4: Current program approaches do not address standard use LEDs so “existing program approaches” won’t make much difference. I suspect federal standards will drive incandescents. I expect in the longer term the advantages of LEDs will swamp CFLs and incandescents, even without programs.

Respondent 7: Based on research and data from the Low Income Weatherization program there is 1 socket per 40 square feet of floor space across all housing types of various sizes. It is possible to replace virtually every incandescent bulb with a suitable CFL or Cold Cathode (CCCFL). LED will be bright enough in 2 to 3 years and cost competitive in 4 to 5 years.

Respondent 9: Based on my involvement in a number of CFL market evaluations around the country, I believe the market for CFLs is largely transformed, and that in the absence of any significant change in Wisconsin’s program approach, the net-to-gross ratio is likely to plunge over the next few years. I believe that LEDs are still a fair ways from being commercially viable for a significant number of residential applications. Over the next four years, I would guess that the biggest opportunities for lighting savings may lie in promoting specialty CFLs and in limiting the diffusion of high-efficiency incandescents that might otherwise replace CFLs, which I would expect to become the dominant technology. Over the longer run, I would anticipate that LEDs would be the main savings opportunity. However, this would be over a baseline of CFLs rather than incandescents, and my understanding is that it is unlikely that LEDs will ever enjoy nearly as much of a relative efficiency advantage over CFLs as CFLs currently do over incandescents. So my guess is that after a year or two from now, lighting will be significantly reduced as a residential savings opportunity, more or less permanently. Given that the majority of residential electric savings has been coming from CFLs, I see this filling this gap as the paramount challenge facing residential program planners.

Residential Retrofit Insulation and Air Sealing

5. In your opinion, what is the most effective way to stimulate homeowners to correct insulation and air sealing deficiencies in single-family homes?

Respondent 1:
The most effective approach would be a universal weatherization program that has auditors, final inspectors, and oversight inspections following high standards as is done currently in the low-income weatherization program. The work done in the low income weatherization program

is much better than what is being done in the private sector. This higher quality needs to be brought to all homes.

Respondent 2:
Require insulation companies to Air seal prior to adding insulation to be eligible for any incentives. Train more insulation firms in the correct way to air seal. Market air sealing more to homeowners.

Respondent 11: Adjust cost of energy based on usage.

Respondent 13: At this point, it is probable that the majority of poorly-insulated SF/duplex homes are rented, and have been for a number of years. In this case, the only program model likely to be successful will be a "weatherization" approach, where the vast majority of improvement is subsidized. I would estimate that subsidies of 50% or more will be necessary to move this market.

6. In 2008, what percent of single-family owner-occupied homes would you say…

Respondent 1:

a.	…have uninsulated walls (Inadequate)?	50%
b.	…have inadequately insulated ceilings?	40%
c.	…have excessive air leakage?	80% (>1200 CFM50)
d.	…have any significant shell deficiency?	70%
e.	Have inadequate foundation insulation?	80%

Respondent 2:

a.	…have uninsulated walls?	40%
b.	…have inadequately insulated ceilings?	60%
c.	…have excessive air leakage?	60%
d.	…have any significant shell deficiency?	60%

Respondent 11:

a.	…have uninsulated walls?	15%
b.	…have inadequately insulated ceilings?	30%
c.	…have excessive air leakage?	40%
d.	…have any significant shell deficiency?	65%

Respondent 13:

a.	…have uninsulated walls?	12%
b.	…have inadequately insulated ceilings?	10%
c.	…have excessive air leakage?	20%
d.	…have any significant shell deficiency?	35%

7. What are your estimates (by program scenario and time period) of the percent of Wisconsin single-family homes that have a significant insulation or air leakage shell deficiency?

Respondent 1:

	% of WI single-family homes built prior to 2008 with one or more significant shell deficiencies		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	80%	N/A
2012 (in four years)	80%	79%	50%
2018 (in ten years)	80%	75%	20%

Respondent 2:

	% of WI single-family homes built prior to 2008 with one or more significant shell deficiencies		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	60	N/A
2012 (in four years)	45	50	40
2018 (in ten years)	45	40	30

Respondent 11:

	% of WI single-family homes built prior to 2008 with one or more significant shell deficiencies		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	65%	N/A
2012 (in four years)	60%	55%	40%
2018 (in ten years)	55%	45%	30%

Respondent 13:

	% of WI single-family homes built prior to 2008 with one or more significant shell deficiencies		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	35	N/A
2012 (in four years)	35	34	30
2018 (in ten years)	35	30	15

8. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	**2**	**3**	**4**	**Expert 5**
			4	

Respondent 2:

Novice 1	2	3	4	Expert 5
		x		

Respondent 7:

Novice 1	2	3	4	Expert 5
		X		

Respondent 11:

Novice 1	2	3	4	Expert 5
		*		

Respondent 13:

Novice 1	2	3	4	Expert 5
		XX		

9. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1:
This market is the most difficult to address adequately because it is the hardest work of any area in energy conservation. Too much work is being done incompletely, making it that much harder to redo the work in the future to the standards that should have been met the first time. For example, if a house is to be re-sided, it should have to meet air sealing and insulation standards. This can be done with rules or incentives or a universal weatherization program.

Respondent 2: Insulation companies are just out to make money and most don't care if they solve owner comfort issues or save the owner any money.

Respondent 7: The Low Income Weatherization Program may be able to provide data on the 2008 status in question 6.

Respondent 11: Dollars savings alone will not provide the momentum for homeowners. (Unless cost increase significantly) We have to reduce lost energy saving opportunities when a home improvement project of any sort is underway. Selling additional energy saving measures has to come from the individual that will prosper from the sale.

Respondent 13: Rentals, rentals. There are multiple barriers; split incentives, under-capitalized/over-leveraged small sole proprietor businesses, and a bias amongst owners toward laissez faire and anti-government attitudes.

Residential HVAC Market

10. Is the current cash-reward approach the most effective way to increasing the penetration of electrically-efficient furnaces in Wisconsin? If not, what would you recommend?

Respondent 1: The new Uniform Dwelling Code will have Energy Star furnaces and boilers required for use of the baseline code prescriptive U-values equivalent to IECC 2006. If less efficient furnaces are used, the windows and foundation insulation must be more energy efficient than IECC 2006. I think more consumer education regarding furnace fan use can occur through Focus on Energy, heating contractors, utilities, and building science consultants. Continuous use of the fan increases infiltration and heat loss in homes. It may only make sense when a HEPA filter is being used for occupants with sinus problems. But even in these cases, it may be more detrimental than beneficial. There are usually other issues in the home that need to be addressed such as air sealing and insulation.

Respondent 3: Probably, look into upstream agreements w/ manufacturers, including extended motor warranties. Contractor rewards? Most effective of all would be a DOE min. efficiency standard for furnace motors.

Respondent 5: The simpler the better. Many dealers do not get enough value in selling the upgrades from a profit standpoint versus the extra work involved to get the claim processed. If there would be a way the consumer can do it would be a benefit, and would possibly get more dealer participation in the program, resulting in a larger reduction in the electrical usage by the HVAC systems.

Respondent 7: Modify building codes for new construction to require furnaces meeting advanced efficiency standards.

Respondent 8: YES- most customers have a lot on their plate when building a new home. ENERGY RELATED issues to those not interested, can be pulled along as traditionally done with incentives.

Respondent 11: Yes.

Respondent 13: This is probably the best approach—it motivates installers to do the selling for you.

11. What are your estimates (by program scenario and time period) of the market share for electrically efficient furnaces?

Respondent 1:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	25	35	50
2018 (in ten years)	30	45	60

Respondent 3:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	20	40	50
2018 (in ten years)	15	45	55

Respondent 5:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	50%	60%	70%
2018 (in ten years)	70%	75%	80%

Respondent 7:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	40	50	70
2018 (in ten years)	50	70	80

Respondent 8:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	30-35	40-50	50-60
2018 (in ten years)	35-40	50-60	60-70

Respondent 11:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	35%	40%	45%
2018 (in ten years)	40%	50%	60%

Respondent 13:

	WI market share (%) for electrically efficient furnaces		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2012 (in four years)	30	40	50
2018 (in ten years)	35	50	70

12. Which of the following best represents your view of the ability of state- or utility-funded efforts to mitigate the take-back of electricity savings that arises from consumers switching to continuous-fan operation?

Respondent 1: Programs could have a major impact on fan operation practices

Respondent 3: Programs could have some effect on fan operation practices.

Respondent 5: There is little that programs can do about this issue.

Respondent 7: Programs could have some effect on fan operation practices.

Respondent 8: Programs could have some effect on fan operation practices.

Respondent 11: Programs could have some effect on fan operation practices.

Respondent 13: Programs could have some effect on fan operation practices. -- It is possible that a solid customer education could have some influence. But the move to continuous operation is promoted in part by filter and “air cleaner” marketing, and those companies on incentive to do more/better marketing, or maybe even to damage FOE programs if an efficiency initiative gets too effective. The other part of this problem is that constant circulation is sometimes used to cover up other shell problems that cause drafts. Once people perceive that “drafts” are a problem in their home, that seems to be an unshakeable assumption, even if standard (non lo-E coated) windows, poor duct design/performance or other defects are the real cause of the discomfort.

13. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			4	

Respondent 3:

Novice 1	2	3	4	Expert 5
			x	

Respondent 5:

Novice 1	2	3	4	Expert 5
			x	

Respondent 7:

Novice 1	2	3	4	Expert 5
		X		

Respondent 8:

Novice 1	2	3	4	Expert 5
			4.5	

Respondent 11:

Novice 1	2	3	4	Expert 5
			*	

Respondent 13:

Novice 1	2	3	4	Expert 5
		XX		

14. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: The challenge is to create some competition in the manufacture of ECM fan motors. GE is the principal manufacturer. In 2007 according to John Proctor, there was to be another manufacturer that would bring the price of the motor down. I have not seen this happen in the market. The challenge with any competing manufacturer is to have the market trust and stability to convince manufacturers to buy the less costly ECM to put in their furnaces. Commerce has asked Pacific Northwest Laboratory to modify ResCheck to have three thresholds for furnaces: 78%, 90% and 94%. The 94% threshold is conceived to promote the installation of ECM furnaces to obtain trade-off capabilities with the building shell overall U-value. There will be no trade-offs below 94%. Below 90%, there is the penalty of going to a more stringent prescriptive U-value table for windows and foundation insulation. The new code is scheduled to be effective April 1, 2009.

Respondent 5: A study should be done to determine the energy saved by moving air continuously in residential applications. What I believe you will find is that there would be less electric heaters used if the temperature throughout the home would be better balanced. The operation of the fan continuously generally improves the overall comfort throughout the home.

Respondent 7: Low Income Weatherization should require ECM furnace installations to get more of these units installed. Regal Beloit now owns the GE ECM motor manufacturer that supplies units used in advanced furnaces. This is a Wisconsin company.

Respondent 8: YES- I think consumers may be willing to change their ‘energy’ habits if they understood the PEAK DEMAND concern that programs and the PSC have to deal with.

Respondent 11: I am in hundreds of homes a year asking many energy use related items questions, I find that most do not run their furnace fan even with the ECM fan motor. My experience tells me that maybe this isn’t as wide spread as some think.

High Efficiency Central Air Conditioners

15. Are cash rewards the most effective way to increase the penetration of high-efficiency air conditioners in Wisconsin? If not, what do you suggest?

Respondent 1: I believe that oversizing central air conditioners is a greater problem than with furnaces. Incentives should be greater the smaller the tonnage. Or some mechanism should be devised that creates an incentive for smaller units. Also, incentives should be based on EER not SEER. Peak loads are a major concern in Wisconsin and EER addresses this better. California has paved the way for the use of EER. Not enough is known about inefficiencies created by poor installations in Wisconsin. It may be that there is more to be saved with good installations than with higher SEER or EER. There should be an incentive system and 800 telephone system as used in California for ensuring proper installation and servicing of air conditioners.

Respondent 3: Probably, but investigate upstream options. Doesn't have to be one or the other.

Respondent 5: Cash to the consumer is a good way to get them to move up. The cost to upgrade out ways the reward amount in many cases though.

Respondent 7: Probably cash rewards are best coupled with a discount off the monthly bill for installation of remote control load control.

Respondent 8: YES- until consumers get serious about 'operating costs' on a home. We need to reduce peak loads. Consumers do not understand the effect of peak load on their annual electric costs!

Respondent 10: Yes, until even higher SEER standards (though there are diminishing returns in our climate zone).

Respondent 11: Yes.

Respondent 13: No, this is a place where some sort of public mandate is the only reasonable solution. A/C initiatives in Wisconsin will never be cost-justifiable in a state where average annual consumption is 700 kWh, and efficiency gains attributable purely to the hardware might be 10-20%. The real issue here is summer peak demand. And there are much bigger chunks of summer peak demand to be harvested, at less program cost,20 in commercial and industrial markets.

16. What are your estimates (by program scenario and time period) of the market share for SEER 14 and SEER 15+ air conditioners in Wisconsin?

Respondent 5:

Year	% of WI central AC market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	Flat	+5%	Flat	+10%	Flat	+ 15%
2018 (in ten years)						

Respondent 7:

Year	% of WI central AC market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	10	5	15	10	20	20
2018 (in ten years)	20	15	30	20	40	40

Respondent 8:

Year	% of WI central AC market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	20	20	25	25	30	35
2018 (in ten years)	30	30	35	35	40	45

Respondent 10:

Year	% of WI central AC market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	25	15	30	20	35	25
2018 (in ten years)	30	20	40	30	45	35

Respondent 11:

Year	% of WI central AC market					
	In the <u>absence</u> of state or utility programs		Under <u>existing</u> program approaches and funding		Under the <u>most aggressive possible</u> program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	25%	20%	35%	30%	50%	40%
2018 (in ten years)	30%	25%	40%	35%	65%	50%

Respondent 13:

Year	% of WI central AC market					
	In the <u>absence</u> of state or utility programs		Under <u>existing</u> program approaches and funding		Under the <u>most aggressive possible</u> program approaches and funding	
	SEER 14	SEER 15+	SEER 14	SEER 15+	SEER 14	SEER 15+
2012 (in four years)	25	5	30	10	30	10
2018 (in ten years)	30	10	35	10	40	10

17. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		3		

Respondent 3:

Novice 1	2	3	4	Expert 5
		x		

Respondent 5:

Novice 1	2	3	4	Expert 5
			X	

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 8:

Novice 1	2	3	4	Expert 5
			4.5	

Respondent 10:

Novice 1	2	3	4	Expert 5
		X		

Respondent 11:

Novice 1	2	3	4	Expert 5
		*		

Respondent 13:

Novice 1	2	3	4	Expert 5
		XX		

18. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: Air conditioning is needed much less in a house that is well air sealed, insulated, shaded by trees, and has windows with low solar heat gain coefficients on all sides. More thought can be given to addressing these factors that will contribute greater air conditioning savings than a higher SEER or EER unit. If it is conceived what could be added to the Uniform Dwelling Code to address cooling efficiencies, program efforts could pave the way for these to be included in code sooner.

Respondent 3: Market share not my area of expertise. I was surprised at % of 14+ SEER currently.

Respondent 13: With new construction likely to be stalled for awhile, the program impact will be limited largely to replace-on-failure. This suggests to me that there is not a lot of room to impact this market.

Other Technologies

19. Do you feel these technologies should be pursued by state- or utility-funded programs in Wisconsin? (Yes answer)

Respondent 1: Ductless mini-split systems; ground-source heat pumps.

Respondent 2: Ductless mini-split systems; dual-fuel heat pumps.

Respondent 3: Ductless mini-split systems.

Respondent 5: Duel-fuel heat pumps; ground-source heat pumps.

Respondent 8: Ductless mini-split systems; dual-fuel heat pumps; cold-climate heat pumps; ground-source heat pumps.

Respondent 11: Ductless mini-split systems; dual-fuel heat pumps; cold-climate heat pumps; ground-source heat pumps.

Respondent 13: Ductless mini-split systems. (Especially in apartments and condos, where the present alternatives are woefully inefficient.)

20. For the technologies that you indicated should be pursued by Wisconsin programs, what are your estimates (by program scenario and time period) of market share?

Respondent 5:

	% of WI Residential HVAC market								
	In the absence of state or utility programs			**Under existing program approaches and funding**			**Under the most aggressive possible program approaches and funding**		
Year	2008	2012	2018	2008	2012	2018	2008	2012	2018
Ductless mini-split	N/A						N/A		
Dual-fuel heat pump	N/A	40%	65%		47%	70-%	N/A	60%	80%
Cold-climate heat pump	N/A						N/A		
Ground-source heat pump	N/A	10%	15%		15%	25%	N/A	16%	20%

Respondent 8:

	% of WI Residential HVAC market								
	In the absence of state or utility programs			**Under existing program approaches and funding**			**Under the most aggressive possible program approaches and funding**		
Year	2008	2012	2018	2008	2012	2018	2008	2012	2018
Ductless mini-split	N/A	3	5	6	8	10	N/A	12	14
Dual-fuel heat pump	N/A	5	7	N/A	15	20	N/A	18	25
Cold-climate heat pump	N/A	1	2	N/A	7	9	N/A	10	15
Ground-source heat pump	N/A	2	5	N/A	7	9	N/A	12	15

Respondent 11:

	% of WI Residential HVAC market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
Year	2008	2012	2018	2008	2012	2018	2008	2012	2018
Ductless mini-split	N/A	5%	10%	3%	5%	10%	N/A	15%	25%
Dual-fuel heat pump	N/A	5%	10%	3%	5%	10%	N/A	15%	25%
Cold-climate heat pump	N/A						N/A		
Ground-source heat pump	N/A						N/A		

21. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		3		

Respondent 2:

Novice 1	2	3	4	Expert 5
	x			

Respondent 3:

Novice 1	2	3	4	Expert 5
		x		

Respondent 5:

Novice 1	2	3	4	Expert 5
			X	

Respondent 7:

Novice 1	2	3	4	Expert 5
	X			

Respondent 8:

Novice 1	2	3	4	Expert 5
			4	

Respondent 11:

Novice 1	2	3	4	Expert 5
		*		

Respondent 13:

Novice 1	2	3	4	Expert 5
		XX		

22. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: Ground source heat pumps have many very successful installations in Wisconsin. They will continue to be installed because of the operating cost savings and may not need much incentives for those situations where this is possible. Split systems can initially be targeted to those homes with boilers. As they become better known in the market, I think there will be a fast growth in their use. They also can be very beneficial in mobile homes and small commercial buildings. I am not knowledgeable enough in this area to give market growth forecasts.

Respondent 3: Again, predicting how programs will affect market share isn't my strong suit. Giving customers info to help them make decisions is.

Respondent 5: Dual fuel applications will be on the rise based on the volatility of the gas and electric prices. Having the option to use gas for some of the winter and electric through the heat pumps for the milder weather will definitely increase. The thought of the compound heat pumps like you mention will be a very limited line for some time until the technology develops further.

Respondent 8: YES: I think the duel-fuel heat pump has a good potential especially if we had duel-fuel rates available state wide. SMART thermostats communicating with Utility Companies could allow the best fuel cost to be selected as fuel costs change!

New Home Construction

23. How much do you think state- or utility-funded voluntary programs could realistically be expected to achieve in terms of reducing energy usage in the average new home for the following end-uses:

Respondent 1:
a. Space heating: 15% lower than typical new construction
b. Space cooling: 20%
c. Water heating: 15%
d. Lighting: 75%
e. Refrigeration: 10%
f. Other appliances: 15%

Respondent 7:
a. Space heating: 15% lower than typical new construction
b. Space cooling: 10%
c. Water heating: 30%
d. Lighting: 75%
e. Refrigeration: 20%
f. Other appliances: 15%

Respondent 8:
a. Space heating: 15% lower than typical new construction
b. Space cooling: 10%
c. Water heating: 10%
d. Lighting: 15%
e. Refrigeration: 10%
f. Other appliances: 15%

Respondent 10:
a. Space heating: 15% lower than typical new construction
b. Space cooling: 10%
c. Water heating: 10%
d. Lighting: 25%
e. Refrigeration: 10%
f. Other appliances: 20%

24. What do you think is the best way for voluntary programs to encourage efficient new home construction?

Respondent 1: A strong marketing recognition needs to be established for Wisconsin Energy Star Homes that are higher quality homes than others. This needs to be integrated with green building practices and market recognition.

Respondent 5: With the rising costs to heat and cool our homes the normal market will correct itself as a result. The consumers want more efficiency we see this all the time, but when the builder is in control it still boils down to cost per square foot as the mechanicals in their minds do not help sell the home.

Respondent 7: Promote Energy Star Homes with all Energy Star appliances, natural gas water heating, CFL installed through out, condensing ECM furnaces, super insulation, Energy star Roofing, daylighting or Zero Energy homes.

Respondent 8: CONSUMER & BUILDER WORKSHOPS along with constant marketing efforts. Under the pilot program in 98-99 where the message was constant and with extensive coverage, we had plenty of interest on a regular basis.

Respondent 10: Codes and standards.

25. What are your estimates (by program scenario and time period) of the fraction of new Wisconsin homes built each year that are at least 10% more efficient in terms of space heating and cooling compared to current conventional construction practices?

Respondent 1:

	% of WI single-family homes that are at least 10% more efficient for space conditioning than current conventional construction		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	9%	N/A
2012 (in four years)	8-9%	9%	15%
2018 (in ten years)	8-9%	10-11%	25%

Respondent 7:

	% of WI single-family homes that are at least 10% more efficient for space conditioning than current conventional construction		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	10	N/A
2012 (in four years)	10	20	30
2018 (in ten years)	20	30	40

Respondent 8:

	% of WI single-family homes that are at least 10% more efficient for space conditioning than current conventional construction		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	10	N/A
2012 (in four years)	13	18	20
2018 (in ten years)	15	20	25

26. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	**2**	**3**	**4**	**Expert 5**
			4	

Respondent 7:

Novice 1	**2**	**3**	**4**	**Expert 5**
	X			

Respondent 8:

Novice 1	**2**	**3**	**4**	**Expert 5**
				5.0

27. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: The Wisconsin Energy Star Homes program will need to have some major improvements in its standards when the Uniform Dwelling Code revision takes effect April 1, 2009. There will no longer be tradeoffs based on an Energy Star furnace being installed with the overall U-value of the home, unless a furnace with an AFUE of 94% or higher is installed. And this tradeoff will not be that great compared to what exists now. Incentives for blower door testing and air tightness could pave the way for inclusion of air tightness requirements in the next UDC revision in 2012.

Respondent 8: YES: I believe consumers are interested in reducing the cost of operation, but they need to be assured it can be done. Information along with constant awareness, I believe, can help them get over the uncertainty.

Residential Refrigeration

28. What are your estimates for the market share for ENERGY STAR qualified refrigerators in Wisconsin?

Respondent 4:

	Market share (% of annual WI refrigerator sales that meet or exceed current ENERGY STAR criteria)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	33	N/A
2012 (in four years)	38	40	45
2018 (in ten years)	40	45	50

Respondent 7:

	Market share (% of annual WI refrigerator sales that meet or exceed current ENERGY STAR criteria)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	30	N/A
2012 (in four years)	30	40	50
2018 (in ten years)	40	50	60

Respondent 9:

	Market share (% of annual WI refrigerator sales that meet or exceed current ENERGY STAR criteria)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	40%	N/A
2012 (in four years)	40%	45%	60%
2018 (in ten years)	40%	50%	65%

29. Can state or utility-funded programs have a meaningful impact on the number of secondary refrigerators in Wisconsin homes? If so, how?

Respondent 4: No. I suspect that the fraction of people who have them and don't have a strong desire to keep them is small.

Respondent 7: Yes Have more Turn In Programs, Pick Up Programs, Incentive such as $100 coupled with pick up with in 2 days of contact or inquiry.

Respondent 9: Yes. While I think the track record has been mixed, there are a number of examples of turn-in programs that appear to have had this effect based on evaluation results. Further, consciousness about global warming appears to have risen to a level where it may be possible to use moral suasion to convince some people to get rid of existing secondary units.

30. If you answered "yes" to the previous question, what are your estimates for the percent of Wisconsin single-family homes with secondary refrigerators under the following scenarios?

Respondent 7:

	% of WI single-family homes with secondary refrigerators		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	20	N/A
2012 (in four years)	20	18	15
2018 (in ten years)	20	15	10

Respondent 9:

	% of WI single-family homes with secondary refrigerators		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	20%	N/A
2012 (in four years)	20%	20%	15%
2018 (in ten years)	20%	20%	10%

31. Similarly, can state or utility-funded programs have a meaningful impact on the number of stand-alone freezers in Wisconsin homes? If so, how?

Respondent 4: No. same reason.

Respondent 7: Yes Turn In Programs, Pick Up Programs and Incentives Try 2 for 1 Replacement (New Energy Star larger freezer for every 2 old units removed).

Respondent 9: Same rationale as for 2nd fridges.

32. If you answered "yes" to the previous question, what are your estimates for the percent of Wisconsin single-family homes with stand-alone freezers under the following scenarios?

Respondent 7:

	% of WI single-family homes with stand-alone freezers		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	60	N/A
2012 (in four years)	55	50	45
2018 (in ten years)	50	40	30

Respondent 9:

	% of WI single-family homes with stand-alone freezers		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	60%	N/A
2012 (in four years)	60%	60%	45%
2018 (in ten years)	60%	60%	30%

33. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 4:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

Respondent 7:

Novice 1	**2**	**3**	**4**	**Expert 5**
				X

Respondent 9:

Novice 1	**2**	**3**	**4**	**Expert 5**
		X		

34. Is there anything else we should know about this market or why you provided the responses above?

Respondent 4: The payback from Energy Star qualified refrigerators is so long I don't see them making a big dent in the market.

Respondent 7: There are many units in unconditioned spaces that need to be removed. Many units are not picked up unless they are removed with 2 days.

Residential Clothes Washers

35. Can state or utility-funded programs have a meaningful impact on the market share for more efficient clothes washers in Wisconsin? If so, how?

Respondent 2: Only in certain markets such as the multifamily market where coin-operated top loaders are king, should there be incentives.

Respondent 4: It can, but probably only with significant rebates.

Respondent 6: Rebates on Tier 2 and Tier 3 to offset additional cost of moving up. Education and Advertising on MEF and what makes some washers more efficient.

Respondent 7: Provide incentives through water utilities. Promote (provide) cold water detergent with each Energy Star unit sold.

Respondent 9: I tend to think the answer is no. I haven't seen any numbers recently, but my impression is that given the current range in achievable efficiencies, incremental savings, and current market share, it may be difficult to achieve further cost-effective net savings in this market. However, I can't claim a lot of expertise in this market. Given that this is a Delphi analysis, I'm assuming that the participants will see other panelists' responses and have a chance subsequently to revise their own responses. I may change my answer to this question, and accordingly complete market share estimates, once I see responses from other people with more expertise in the market.

36. If you answered "yes" to the previous question, what are your estimates for the market share for the following high efficiency clothes washer categories?

Respondent 2:

Year	% of Wisconsin residential clothes washer market in Multifamily (4+) Bldgs					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3
2008	N/A	N/A	20	10	N/A	N/A
2012 (in 4 years)	25	10	30	15	40	17
2018 (in 10 years)	30	15	35	20	50	22.5

Respondent 4:

Year	% of Wisconsin residential clothes washer market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3
2008	N/A	N/A	55	30	N/A	N/A
2012 (in 4 years)	65	30	65	30	60	40
2018 (in 10 years)	60	40	60	40	40	60

Respondent 6:

Year	% of Wisconsin residential clothes washer market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3
2008	N/A	N/A	2%	1%	N/A	N/A
2012 (in 4 years)	40%	25%	45%	30%	60%	35%
2018 (in 10 years)	45%	30%	50%	35%	65%	35%

Respondent 7:

Year	% of Wisconsin residential clothes washer market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3	CEE Tier 1	CEE Tier 2 or 3
2008	N/A	N/A	51	33	N/A	N/A
2012 (in 4 years)	55	35	60	40	70	50
2018 (in 10 years)	60	40	70	50	80	60

37. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	2	3	4	Expert 5
			X	

Respondent 3:

Novice 1	2	3	4	Expert 5
	x			

Respondent 4:

Novice 1	2	3	4	Expert 5
1				

Respondent 6:

Novice 1	2	3	4	Expert 5
		X		

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 9:

Novice 1	2	3	4	Expert 5
	X			

38. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: Certain owners of Multifamily buildings will never go to Tier 2 or 3 because it is for their tenants. Getting them to go to Tier 1 will be hard enough. Some of the reasons that owners are upgrading washers now is that HUD/WHEDA are requiring it in handicap accessible buildings. Other owners are doing it when they pay for the water heating and the sewer/water charges. I see a lot of owners going to these washers in the future because water rates in certain parts of Wisconsin could overtake electric and gas charges and being the most costly utility for owners who have only a small common area meter for electric that they currently pay. Marketing needs to be better as many people may perceive that if Focus does not give an incentive on HE Washers, that HE Washers don't save much energy over a standard washer and owners don't want to pay for the incremental cost without an incentive.

Respondent 7: Many dealers now try to have at least 50% of the floor units Energy Star qualified. Federal Maximum Usage Standard, Energy Star and CEE will continue to move various appliances including clothes washers toward greater efficiency.

Residential Water Heaters

39. What are your estimates for the market share by program scenario for the following three gas water heater technologies?
- Conventional, power-vented storage water heaters with an EF between 0.62 and 0.70
- Whole-house, tankless water heaters with an EF of 0.80 or higher
- Condensing, storage water heaters with 90% thermal efficiency or higher.

Respondent 7:

	% of WI gas water heater market								
	In the absence of state or utility programs			**Under existing program approaches and funding**			**Under the most aggressive possible program approaches and funding**		
Year	Conv. Power-vent	Tankless	Condensing	Conv. Power-vent	Tankless	Condensing	Conv. Power-vent	Tankless	Condensing
2008	N/A	N/A	N/A	10	1	<1	N/A	N/A	N/A
2012 (in four years)	10	5	1	20	10	5	40	10	5
2018 (in ten years)	20	10	5	40	20	10	60	20	10

Respondent 8:

Year	% of WI gas water heater market								
	In the absence of state or utility programs			Under existing program approaches and funding			Under the most aggressive possible program approaches and funding		
	Conv. Power-vent	Tankless	Condensing	Conv. Power-vent	Tankless	Condensing	Conv. Power-vent	Tankless	Condensing
2008	N/A	N/A	N/A		2		N/A	N/A	N/A
2012 (in four years)	10	4	5	15	5	10	20	8	15
2018 (in ten years)	15	6	8	20	8	15	30	10	20

40. What are your estimates for the market share by program scenario and time period for the following two electric water heater technologies?
- Conventional storage water heaters with an EF of 0.93 or higher.
- Heat pump water heaters

Respondent 7:

Year	% of WI electric water heater market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	High EF conventional	Heat pump	High EF conventional	Heat pump	High EF conventional	Heat pump
2008	N/A	N/A	5	1	N/A	N/A
2012 (in four years)	5	1	10	4	15	5
2018 (in ten years)	10	4	15	5	20	10

Respondent 8:

Year	% of WI electric water heater market					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
	High EF conventional	Heat pump	High EF conventional	Heat pump	High EF conventional	Heat pump
2008	N/A	N/A	6	0	N/A	N/A
2012 (in four years)	10	1	14	2	12	2
2018 (in ten years)	12	1	16	3	18	4

41. Can State or utility-funded programs make a meaningful difference in the proportion of Wisconsin homes that have conventional electric water heaters? If so, how?

Respondent 3: Promote conversion to gas via water heater installers.

Respondent 7: Yes Promote conversion of electric to natural gas in urban areas or propane in rural areas. Provide natural gas stubs in new construction. Work with plumbers and convert every electric unit to natural gas or propane.

Respondent 8: YES: if the homeowner has upfront operating cost estimates between Gas and electricity. It would help them make the choice.

42. If you answered yes to the previous question, what are your estimates (by scenario and time period) of the proportion of Wisconsin homes with electric water heaters?

Respondent 7:

	% of WI single-family homes (existing) with electric water heaters		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	25	N/A
2012 (in four years)	20	18	10
2018 (in ten years)	15	10	5

Respondent 8:

	% of WI single-family homes with electric water heaters		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A		N/A
2012 (in four years)	Not sure	Not sure	Not sure
2018 (in ten years)	Not sure	Not sure	Not sure

43. Do you foresee significant potential savings in Wisconsin from combined space and water heating technologies (such as condensing boilers with indirect water heaters) over the next 10 years?

Respondent 3: No. most people aren't buying both devices at same time.

Respondent 7: Possible bog effect in multi family, not in single family.

Respondent 8: It's possible in some cases.

44. If you answered yes to the previous question, what are your estimates (by scenario and time period) of the fraction of single-family Wisconsin homes with combined space and water heating systems?

Respondent 7:

	% of WI single-family homes with combined space and water heating systems		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A	2	N/A
2012 (in four years)	2	3	4
2018 (in ten years)	3	4	5

Respondent 8:

	% of WI single-family homes with combined space and water heating systems		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A		N/A
2012 (in four years)	5	8	12
2018 (in ten years)	8	12	15

45. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 3:

Novice 1	2	3	4	Expert 5
		x		

Respondent 7:

Novice 1	2	3	4	Expert 5
			4	

Respondent 8:

Novice 1	2	3	4	Expert 5
		3.5		

46. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: Water heating could be added to the Uniform Dwelling Code if program efforts prepared the market for the most efficient means that could be included in code.

Respondent 8: YES: combined systems can be efficient but anything dealing with ‘hydronics’ is very sensitive to design, setup and commissioning. Not all HVAC folks are good at setup of hydronic systems.

Multi-family
Multi-family Heating Systems

47. What program strategy do you think would provide the most effective approach to reduce total heating space energy for Wisconsin's multi-family buildings?

Respondent 2: Rather than just a Tiered approach that we use now, I suggest a tiered/staged approach could be more effective. The client who gets Focus involved early in the process gets more incentive than the person who calls up and wants their incentive quote tomorrow because the boiler is going in next week. If Focus were to get involved early in the process we can offer a higher incentive than on an equipment only replacement (Tier I) but also water heating, lighting, and Building Shell measures. If this process were to be staged it would initiate more interaction with the client, causing a suggested higher return of savings from the identification of more projects. The prescriptive track should remain available as well, but more often than we are now, we should promote having an Energy Advisor out for an assessment first and only when the equipment is in place or in the favor for the customer should we go custom. We may also look at a benchmarking approach…similar to NYSERDA. A specification book as to what does or does not qualify for FOE Incentives should be required to ensure correct program compliance with a more stringent QA process.

Respondent 7: Aggressive promotion of small condensing multiple unit boilers. Conversion of electric space heating to natural gas combination furnace water heater units.

Respondent 13: First, find some tenant agency to file a statewide class-action lawsuit and take Dept. of Commerce to court for not enforcing the Rental Weatherization code as it existed prior to 2007, and to sue the 13,000 owners that were out of compliance with the law as of that date. Then, offer immunity from the lawsuit for every owner that participates in an FOE program that pays 20% of the cost of bringing their building into compliance with the current Commercial/MF energy code. (Or, of course, to maximum structurally possible…) Then, when you are done laughing at that idea, consider just holding your nose and engaging some very substantial subsidy level. Without some very aggressive push/compulsion, MF owners are not going to participate to any substantial degree with a program. Subsidies of 25-50% of hard costs, or of 3-8 years of energy savings, are probably the minimum that will generate substantial program activity. This will be somewhat less costly if a robust blower door testing/infiltration reduction element is a mandatory part of the program, and then heating systems are downsized accordingly.
But, do consider strategies whereby strategic allies could apply some level of compulsion. The MF market is far too heavily influenced by the lowest common denominator owner/operator. Minimum standards for existing buildings to put a floor under the market would save substantial amounts of energy. A realistic energy standard, actually enforced, would be more just and do more to affect this market, than any program model I know.

48. What are your estimates of the market share for high efficiency condensing furnaces (AFUE >= 90%) among all furnaces installed in 2-4 unit buildings under the program scenarios and time periods listed below?

Respondent 2:

	Distribution of high efficiency furnaces in small multi-family (2-4 unit) buildings (% of all furnaces with an AFUE of 90% or higher))		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	25%	N/A
2012 (in four years)	25%	30%	40%
2018 (in ten years)	30%	30%	55%

Respondent 7:

	Distribution of high efficiency furnaces in small multi-family (2-4 unit) buildings (% of all furnaces with an AFUE of 90% or higher))		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	80	N/A
2012 (in four years)	80	90	90
2018 (in ten years)	80	90	95

Respondent 13:

	Distribution of high efficiency furnaces in small multi-family (2-4 unit) buildings (% of all furnaces with an AFUE of 90% or higher))		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	25%	N/A
2012 (in four years)	25%	30%	35%
2018 (in ten years)	25%	40%	50%

49. What are your estimates of the market share for high efficiency condensing boilers among all boilers installed in multifamily buildings under the program scenarios and time periods listed below?

Respondent 2:

	Distribution of high efficiency boilers in multi-family buildings (% of all boilers that are condensing)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	10%	N/A
2012 (in four years)	15%	25%	30%
2018 (in ten years)	20%	27.5%	45%

Respondent 7:

	Distribution of high efficiency boilers in multi-family buildings (% of all boilers that are condensing)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5	N/A
2012 (in four years)	10	20	40
2018 (in ten years)	20	40	80

Respondent 13:

	Distribution of high efficiency boilers in multi-family buildings (% of all boilers that are condensing)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5%	N/A
2012 (in four years)	10%	15%	25%
2018 (in ten years)	10%	25%	50%

50. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	2	3	4	Expert 5
				X

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 13:

Novice 1	2	3	4	Expert 5
				XX

51. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: My answers above on HE Furnaces that are currently in existing buildings are slanted toward duplexes. In the 4+ Multifamily market it is very hard to convince any owners to upgrade to HE (90%) furnaces and completely impossible to get an owner to go to a HE Furnace w/ECM motor. The ACES WBE Program has rewarded only 155 HE Furnaces, and only 9 HE Furnaces w/ ECM motors in 7 years. Condo groups have had some of the only successes with HE Furnaces of either type because they own the units. IMO, we should go back to requiring only that the furnaces be HE (90%) in apartment buildings because the costs from going from an 80% to 90% are prohibitive when the owner does not pay the utilities in the unit. (This is the same argument for 14+ SEER A/C units and Power vented water heaters. No one is putting them in existing multifamily(4+) buildings!) Convincing owners to go to upgrade to HE (90%) Boilers, is easier than furnace upgrade projects as they are paying for the gas to heat the building. The ACES program has had great success in the 4+ market due to our influencing of owners and contractors of the benefits of sealed combustion, condensing, modulating boilers. Many contractors are not even recommending 85-89% boilers as they require expensive stainless steel venting and 90% efficient boilers are vented out in PVC. That being said, our market penetration in Multifamily buildings going to HE Boilers is most often in the smaller, 8-40 unit, buildings. The 40 unit+ buildings are using such large equipment that the cost of combining (10)-200,000 btu HE boilers to heat, does not have as good of a return on investment than going with (2)- 1 million btu, Mid-High Efficiency (85-89%) boilers that modulate. These large (40+ unit) buildings are tougher to influence and they are the most reluctant to change. Of the existing 90% Boilers that are currently installed, few are in the large buildings. So of those large Mechanical/HVAC firms that deal with the largest buildings, most do not promote HE Boilers. They are not willing to take the risks that a smaller, hungrier contractor will. Those 40+ unit buildings have the largest utility bills, and the most potential second only to a Steam to HE Hydronic boiler conversions. The downside of Steam to HE Hydronic boiler conversions is the potential of leaks and high risks involved with the conversion.

Respondent 7: The Low Income Weatherization program for multi family should be able to provide data on boiler vs. furnace installations in 2 – 4 unit buildings.

Respondent 13: This is an ideal market in which to pursue high-efficiency mini-split AC units. The standard AC systems used, especially in condo buildings, are driven largely by first cost, and are often the worst/least efficient technology available that passes federal standards.

Multi-family Common Area Lighting

52. Please complete the tables below to estimate the share of fixtures in multi-family buildings' common areas and outdoor fixtures using the following five lighting technologies in 2008, 2012, and 2018, under the three different program scenarios shown in the table:

- Inefficient incandescent lightbulbs
- Efficient incandescent lightbulbs
- T-12 fluorescent tubes
- T-8 or T-5 fluorescent tubes
- LEDs

Respondent 7:

Year	**Distribution of lighting technology in small (2-4 unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures**														
	In the absence of state or utility programs					**Under existing program approaches and funding**					**Under the most aggressive possible program approaches and funding**				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A					80	0	15	5	0	N/A				
2012 (in four years)	80	0	15	5	0	30	5	5	60	0	20	5	0	70	5
2018 (in ten years)	30	5	5	60	0	20	5	0	70	5	0	10	0	80	10

Respondent 7:

Year	**Distribution of lighting technology in large (5+ unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures**														
	In the absence of state or utility programs					**Under existing program approaches and funding**					**Under the most aggressive possible program approaches and funding**				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A					80	0	10	10	0	N/A				
2012 (in four years)	80	0	10	10	0	40	5	5	50	0	20	5	0	70	5
2018 (in ten years)	40	5	5	50	0	20	5	0	70	5	0	10	0	80	10

Respondent 13: I PRESUME THAT "EFFICIENT INCANDESCENT" INCLUDES CFLS…

Year	**Distribution of lighting technology in small (2-4 unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures**														
	In the absence of state or utility programs					**Under existing program approaches and funding**					**Under the most aggressive possible program approaches and funding**				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A					70%	10	20			N/A				
2012 (in four years)	70	10	20			25	55	10	10		20	60	5	15	
2018 (in ten years)	60	20	20			30	49	15	5	1	10	55	10	10	15

Respondent 13:

Year	Distribution of lighting technology in large (5+ unit) multi-family buildings' common areas & outdoors (excluding exit signs) -- % of installed lighting fixtures														
	In the absence of state or utility programs					Under existing program approaches and funding					Under the most aggressive possible program approaches and funding				
	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED	ineff inc	eff inc	T12	T8 / T5	LED
2008	N/A					40	10	45	5		N/A				
2012 (in four years)	35	15	45	5		25	24	35	15	1	20	25	25	25	5
2018 (in ten years)	30	20	40	10		20	35	20	30	5	10	30	10	40	10

53. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	2	3	4	Expert 5
				X

Respondent 7:

Novice 1	2	3	4	Expert 5
				X

Respondent 13:

Novice 1	2	3	4	Expert 5
			XX	

54. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: My attached spreadsheet reflects two technologies omitted from the survey: CFLs and Standard T-8 fixtures. They are a must to complete this survey accurately. I see a Regression if there is no program in 2012 in both of these lighting markets. In certain areas of the State CFL fixtures are more prevalent due to Focus on Energy's Direct Install Common Area Lighting Program that CSG ran in the early 2000s. There will always be some owners who are scared of a technology, or are old fashioned, or are slumlords who don't care, that will never upgrade to the newest technology no matter what incentives we offer. We should be able to do more lighting custom, than the route we are headed (making everything prescriptive). A form does not convince an owner to convert their lighting to a more efficient technology, a calc showing savings, incentive levels, and payback, does. The second reason that prescriptive isn't good for this market is that we don't capture much KW from the prescriptive form where we do on the exact same project when calculating it out. If the form were to ask if the lighting is on from 1-4 M-F, that would be better than only asking if the lighting is on 24/7. Quite a few MF buildings have hallway lighting that shuts down to every other fixture late at night off peak. If you are improving the efficiency of these fixtures that some burn 24/7 while others are not but do burn during the 1-4pm Peak time frame, we are not claiming correct KW savings.

Respondent 7: You have neglected CFLs and Cold Cathode CFLs (CCCFL). Many ceiling lights, wall sconces, candelabra sockets and out door lighting use incandescent but could use CFLs and CCCFL. Probably 30% of non unit lighting in multi family is currently incandescent that could be converted to CFL or CCCFL.

Consumer Electronics

55. What program strategy do you think would provide the most effective approach to reduce residential electricity consumption by consumer electronics in Wisconsin?

Respondent 2: Education of buyers and forcing manufactures to include an ENERGY STAR setting on the equipment as standard. That “standby” or ENERGY STAR mode would be automatically on upon plugging in the equipment and to the only way to disable it is done by the owner of the equipment in a menu of some sort.

Respondent 3: Promote advanced power strips (smart strips), perhaps lending them out via public libraries so consumers can test the strips before purchase. Not a one-size-fits-all technology. Promote all-in-one device instead of separate printer/fax/copier.

Respondent 6: Education and Awareness on Energy Star.

Respondent 7: This is essentially a Phantom Load issue. Distribution of remote control sensitive power strips and state wide 1 watt stand by power standard or adoption of the California standard would help reduce standby losses. CRT monitor replacement or Clean Sweep program would help.

Respondent 9: Stocking incentives for products other than computers. Trying to encourage people to buy smaller TVs. Perhaps the two could be combined by providing incentives on ES-qualifying mid-size, but not large, TVs.

56. Please complete the tables below to estimate future trends for the share of current residential electricity consumption in Wisconsin consumed by two major types of consumer electronics under the funding scenarios shown.

Respondent 2:

	Computer Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5	N/A
2012 (in four years)	7	7	6
2018 (in ten years)	12	10	5

Respondent 2:

	<u>Television & Related Video Equipment</u>'s Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A	3	N/A
2012 (in four years)	5	4	3
2018 (in ten years)	7	6	4

Respondent 4:

	<u>Computer Equipment</u>'s Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A	4	N/A
2012 (in four years)	6	6	5
2018 (in ten years)	10	10	8

Respondent 4:

	<u>Television & Related Video Equipment</u>'s Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A	4	N/A
2012 (in four years)	6	6	5
2018 (in ten years)	10	10	7

Respondent 6:

	<u>Computer Equipment</u>'s Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the <u>absence</u> of state or utility programs**	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008	N/A	3%	N/A
2012 (in four years)	5%	4%	3%
2018 (in ten years)	7%	5%	3%

Respondent 6:

	Television & Related Video Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5%	N/A
2012 (in four years)	8%	6%	5%
2018 (in ten years)	9%	7%	5%

Respondent 7:

	Computer Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5	N/A
2012 (in four years)	5	4	3
2018 (in ten years)	5	3	2

Respondent 7:

	Television & Related Video Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5	N/A
2012 (in four years)	5	4	3
2018 (in ten years)	5	3	2

Respondent 9:

	Computer Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	5	N/A
2012 (in four years)	6	6	5
2018 (in ten years)	6	6	4

Respondent 9:

	Television & Related Video Equipment's Share of Residential Electric Consumption in Wisconsin (% of total)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008	N/A	6	N/A
2012 (in four years)	7	7	5
2018 (in ten years)	8	8	4

57. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	**2**	**3**	**4**	**Expert 5**
		x		

Respondent 3:

Novice 1	**2**	**3**	**4**	**Expert 5**
			x	

Respondent 4:

Novice 1	**2**	**3**	**4**	**Expert 5**
	X			

Respondent 6:

Novice 1	**2**	**3**	**4**	**Expert 5**
		x		

Respondent 7:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

Respondent 9:

Novice 1	**2**	**3**	**4**	**Expert 5**
		X		

58. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: If people want big screen TVs they are going to buy them. It is our job to educate them on the usage by brand, and by technology (Projection vs LCD vs Plasma). We also need to influence manufacturers to make the DVD recorders and cable boxes more efficient in standby mode. Whether we give incentives on them or legislate that only ENERGY STAR compliant models are leased by the cable/satellite companies.

Respondent 7: There is some movement toward LED and OLED screens. Large Plasma screens may cause large increases in electric usage. Removal of older units through turn in programs or Clean Sweep would reduce usage.

Commercial/Institutional Delphi Responses

Commercial Packaged AC

1. What are your estimates of the percentage of packaged AC systems sold (e.g. market share) for retrofits and new construction that exceed CEE Tier 3 efficiency levels (which are currently EER 12 but are likely to increase) under the program scenarios and time periods listed below?

Respondent 1:

	Market share (% of annual sales exceeding CEE Tier 3)		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	<5%	N/A
2012 (in four years)	<3%	<10%	<10% (define 'most aggressive')
2018 (in ten years)	<5%	<15%	<20%

Respondent 8:

	Market share (% of annual sales exceeding CEE Tier 3)		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	2%	N/A
2012 (in four years)	5%	15%	20%
2018 (in ten years)	10%	25%	30%

2. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	**2**	**3**	**4**	**Expert 5**
		X		

Respondent 8:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

3. In your opinion, what is the most effective way to increase the market penetration of energy-efficient packaged AC systems in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

Respondent 1: Educating consumers about the cost savings benefits to operating high efficiency packaged AC systems. Some units currently available with 14.3 EER and 16.4 IPLV ratings and have up to 7 different fan speeds to match cooling load. Also, some manufacturers are advertising heating efficiencies over 90%. Don't know if this is utilizing a hot water coil from a high efficiency boiler set up. If rated thermal efficiencies for packaged rooftop units exceeded 90% efficiency, the benefits to commercial customers in this climate would be monumental.

Respondent 8: If more efficient packaged AC systems is defined as CEE Tier 3 equipment, the barrier is a lack of equipment. With the recent code change in WI, the availability of equipment has decreased, and that is with requirements less than Tier 3. Additional barriers are manufacturers not having equipment (or all configurations / options) certified with AHRI, which is needed for the current program to confirm efficiency levels.

4. Is there anything else we should know about this market or why you provided the responses above?

Respondent 8: The information about CEE Tier 3 is somewhat misleading. The 12 EER requirement is only for <240,000 BTU cooling capacity units.

Retrocommissioning

5. What is your estimate of the cumulative percentage of commercial/institutional facilities that will have been retrocommissioned under the program scenarios and time periods listed below?

Respondent 1:

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the <u>absence</u> of state or utility programs	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008*	N/A	<1%	N/A
2012 (in four years)	0%	<1%	1%
2018 (in ten years)	0%	1%	3%

Respondent 2:

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the <u>absence</u> of state or utility programs	**Under <u>existing</u> program approaches and funding**	**Under the <u>most aggressive possible</u> program approaches and funding**
2008*	N/A	5%	N/A
2012 (in four years)	8%	10%	15%
2018 (in ten years)	12%	15%	50%

Respondent 3:

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008*	N/A	5	N/A
2012 (in four years)	7	10	20
2018 (in ten years)	15	35	75

Respondent 7:

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008*	N/A	5	N/A
2012 (in four years)	5	15	20
2018 (in ten years)	5	20	25

Respondent 8:

	Cumulative % of commercial/institutional facilities that have undergone retrocommissioning		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008*	N/A	1%	N/A
2012 (in four years)	2%	5%	15%
2018 (in ten years)	4%	10%	30%

6. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			X	

Respondent 2:

Novice 1	2	3	4	Expert 5
X				

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 8:

Novice 1	2	3	4	Expert 5
				X

7. In your opinion, what is the most effective way to increase the rate of commercial/institutional buildings being retrocommissioned in Wisconsin?

Respondent 1: Have a program that directly contracts the service provider with the Focus program. Incorporate training for service providers. We should evaluate program success by an aggregate, understanding that due to the inability to truly evaluate a facility's potential prior to the investigation, some facilities will exceed savings targets and some will fall short.

Respondent 2: A developed program through Focus on Energy or utilities that customers can understand and trust they will get the value of the service that they are expecting. An innovative way to lower the risk that the service won't pay for itself in energy and O&M cost savings in a short period of time is essential.

Respondent 8: To increase rate of buildings being retro-commissioned, Focus need to work with market providers to promote this service, and to get additional market providers interested in providing this service. The key barrier preventing an increase in retro-commissioning is lack of knowledge on the part of building owners to know how much energy could be saved by this. Building owners not having confidence in the savings numbers projected by retro-cx is also an issue (may sound like contractor trying to sell them a service contract, and are unsure what benefits there will be).

8. What are the key barriers (other than cost) preventing an increase in retrocommissioning activity?

Respondent 1: Limited supply of qualified service providers. Most of the talent in this field is committed to LEED NC projects where they can make a % of the construction costs. We need to train service providers who do not have the technical or reporting experience to provide good RCx studies. RCx is a little understood process that doesn't reveal its true benefit until a substantial investment has been made. Without the RCx program to mitigate first costs, the state would have RCx for LEED EBOM only. Since it is optional in LEED EBOM, the practice would decline.

Respondent 2: The unknown of what exactly the service is targeting and what will be found. This leads to the need for more education on the topic by building operators and managers.

9. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: In order to be cost effective to the program at current incentive rates, RCx studies should be concentrated on buildings that are >100k sqft, have central HVAC systems, EMS systems with DDC and variable occupancy. This reduces the pool of potential buildings.

The potential numbers are very small because of the limited number of service providers who can do this work. During the pilot phase we had 22 projects submit an application. Two of the applications were not approved. Eight additional projects didn't proceed past the planning phase for a multiple of reasons. Of the twelve projects that will close 6 had adequate resources dedicated to the project by the service provider. Ten of the twelve will meet or exceed the savings targets.

Variable-Speed Motors in Commercial HVAC/Refrigeration

10. In commercial/institutional new construction, what are your estimates of the market share for variable speed HVAC motors under the program scenarios and time periods listed below?

Respondent 1: Note: High efficiency fan motors in HVAC have strong future potential. Retrofitting VFD's on new compressors have been troublesome in that low speeds can cause low oil pressures which can prematurely deteriorate compressor motors (a very costly replacement). When an operation is continuous or has a consistent load, there is no reason to install a VFD or variable speed motor. Thus there is a glass ceiling on the technology and should not become a federal requirement. To take all the intangibles out, below is my assessment of fan motors only. Future costs should come down, making these more common.

	% of HVAC motors in new commercial/institutional construction that are variable speed		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	5	N/A
2012 (in four years)	10	20	30
2018 (in ten years)	20	40	60

Respondent 8:

	% of HVAC motors in new commercial/institutional construction that are variable speed		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	30%	N/A
2012 (in four years)	35%	40%	50%
2018 (in ten years)	40%	50%	70%

11. What are your estimates of the cumulative percentage of currently installed HVAC motors that will have been retrofitted with variable speed drives under the program scenarios and time periods listed below?

Respondent 1:

	% of HVAC motors in existing commercial/institutional facilities retrofitted with variable speed drives		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	12	16
2018 (in ten years)	20	22	25

Respondent 8:

	% of HVAC motors in existing commercial/institutional facilities retrofitted with variable speed drives		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10%	N/A
2012 (in four years)	15%	30%	40%
2018 (in ten years)	25%	40%	60%

12. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		x		

Respondent 8:

Novice 1	2	3	4	Expert 5
			X	

13. In your opinion, what is the most effective way to increase the rate of penetration of variable speed motors in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

Respondent 1: Provide clear explanation of where and when they should be considered and also when they should not be considered. There are a lot of “horror stories” about individuals who were burned once or twice by VFD’s and never again will use them.

Respondent 8: Recent code changes have made VSD motors required for 10 hp VAV systems and up. However, a large portion of the packaged / rooftop unit market (especially small commercial, retail) is still constant volume. Facilities with more complex HVAC equipment already use VSD / VAV a lot, but need to promote more in simple systems.

14. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: These are often purchased for non-energy efficient reasons. For example, the "soft-start" property is great and extends motor life but does not save energy in itself. If these are purchased for that alone, no incentive energy incentive should be given.

Commercial Lighting

15. In commercial/institutional new construction, what are your estimates of the market share for HPT8s under the program scenarios and time periods listed below?

Respondent 1:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	10%	N/A
2012 (in four years)	50%	60%	80%
2018 (in ten years)	30%	40%	60%

Respondent 2:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	40%	N/A
2012 (in four years)	25%	60%	75%
2018 (in ten years)	50%	80%	90%

Respondent 3:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	35	N/A
2012 (in four years)	40	50	70
2018 (in ten years)	60	70	90

Respondent 5:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	35	N/A
2012 (in four years)	40	55	70
2018 (in ten years)	50	65	90

Respondent 7:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	10	N/A
2012 (in four years)	15	20	25
2018 (in ten years)	25	30	35

Respondent 8:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	10%	N/A
2012 (in four years)	30%	40%	60%
2018 (in ten years)	40%	50%	70%

Respondent 9:

	% of lighting in commercial/institutional new construction that is HPT8s		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	5	N/A
2012 (in four years)	5	20	40
2018 (in ten years)	20	40	80

16. In commercial/institutional new construction, what are your estimates of the market share for LED lighting under the program scenarios and time periods listed below?

Respondent 1:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	0+%	N/A
2012 (in four years)	1%	5%	10%
2018 (in ten years)	10%	20%	30%

Respondent 2:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	2%	N/A
2012 (in four years)	5%	10%	15%
2018 (in ten years)	10%	15%	25%

Respondent 3:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	0	N/A
2012 (in four years)	1	3	5
2018 (in ten years)	5	15	20

Respondent 5:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	2	N/A
2012 (in four years)	4	8	12
2018 (in ten years)	12	25	40

Respondent 7:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	8	N/A
2012 (in four years)	10	15	20
2018 (in ten years)	14	22	30

Respondent 8:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	.5%	N/A
2012 (in four years)	1%	5%	10%
2018 (in ten years)	10%	20%	30%

Respondent 9:

	% of lighting in commercial/institutional new construction that is LEDs		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	<1	N/A
2012 (in four years)	1	5	10
2018 (in ten years)	5	10	20

17. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting that will have been retrofitted to T8s or better (T5, HPT8, LED, etc.) under the program scenarios and time periods listed below?

Respondent 1:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	15%	N/A
2012 (in four years)	20%	30%	50%
2018 (in ten years)	40%	60%	80%

Respondent 2:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	50%	N/A
2012 (in four years)	55%	65%	80%
2018 (in ten years)	75%	90%	100%

Respondent 3:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55	N/A
2012 (in four years)	60	75	80
2018 (in ten years)	70	85	95

Respondent 5:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	65	75	85
2018 (in ten years)	75	85	95

Respondent 7:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	45	N/A
2012 (in four years)	40	55	60
2018 (in ten years)	50	65	65

Respondent 8:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55%	N/A
2012 (in four years)	60%	75%	85%
2018 (in ten years)	65%	80%	90%

Respondent 9:

	% of currently installed commercial/institutional lighting retrofitted to T8 or better		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	15	30	60
2018 (in ten years)	30	60	80

18. What are your estimates of the cumulative percentage of currently installed commercial incandescent lighting fixtures that will have been retrofitted with CFLs under the program scenarios and time periods listed below?

Respondent 1:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40%	N/A
2012 (in four years)	50%	60%	75%
2018 (in ten years)	50%	60%	75%

Respondent 2:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40%	N/A
2012 (in four years)	50%	60%	75%
2018 (in ten years)	60%	75%	90%

Respondent 3:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55	N/A
2012 (in four years)	65	75	80
2018 (in ten years)	85	90	95

Respondent 5:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	55	65	75
2018 (in ten years)	65	80	90

Respondent 7:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	55	60	65
2018 (in ten years)	58	65	72

Respondent 8:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55%	N/A
2012 (in four years)	60%	70%	80%
2018 (in ten years)	70%	85%	90%

Respondent 9:

	% of currently installed commercial/institutional lighting retrofitted to CFLs		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	20	40	80
2018 (in ten years)	40	80	100

19. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			X	

Respondent 2:

Novice 1	2	3	4	Expert 5
X				

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 5:

Novice 1	2	3	4	Expert 5
				5

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 8:

Novice 1	2	3	4	Expert 5
			X	

Respondent 9:

Novice 1	2	3	4	Expert 5
			X	

20. In your opinion, what is the most effective way to increase the rate of penetration of HPT8 and LED lighting in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

Respondent 1: Direct Install programs and related efforts to reward contractors for actual installation. When it comes to HPT8's there is not an easy way to identify if you have it or if you are installing if it qualifies besides getting each model number and looking it up on the list. That might work for some technologies but not lighting with so many units under consideration for each project. When it comes to LED, a lot of the product on the market has not proven itself yet (like early CFL's and fluorescents) and so true market penetration overtime needs to makes sure the items we support early in a program meet a high standard of quality for continued reputation and growth of market share for the technology. The real importance shouldn't necessarily be increasing the rate of penetration of HPT8 and LED lighting but increasing the occurance of good design that appropriately meets light level while using less energy. HPT8 and LED are only two technologies to help achieve this but better comprehensive solutions can achieve a greater impact toward savings. Overtime as new technologies come forward HPT8 will be what standard T8s are today. Ten to twelve years ago, we were pushing hard to get to T8.

Respondent 2: I believe the most effective way to increase the rate of penetration is to combine incentives for the customers with an aggressive education for distributors and installers. The barriers include the business as usual and lack of desire to change ethic that people generally fall into. An approach that gets customers, distributors and trade allies to look at life cycle costs would improve the penetration.

Respondent 5: Per my comment below, getting from T8 to HPT8 is helpful, but not that big a deal compared to attacking the lighting power density/fixtures choices and controls. Current programs are helpful in getting to the HPT8s. FYI, your definition above of HPT8s as less than 32 Watt does not seem consistent with CEE which says nominal 32 Watt is included in HPT8.

Respondent 8: HPT8 barrier is being able to easily determine what lamps / ballasts go into fixtures. For new construction or major retrofits, distributors sell fixtures and don't have an easy way to track if the lamps and ballasts meet HPT8 specs. LED barrier is high cost, lack of final Energy Star specs (and products that use it), and lots of poor quality products may turn people off to LED technology. Market providers (distributors and fixture manufacturers) need motivation to stock light fixtures that are manufactured with qualified ballasts in them. This could be an upstream incentive, but we have been told that the products need to be pulled by customer demand. To increase demand, incentives are needed to upgrade from standard T8. Because fixtures are not stocked with qualified components, additional lead time is required to have product manufactured and delivered. Additional markups from manufacturer, distributor and installing contractor also increase the price of the product. Having qualified product on the shelf would help eliminate these additional markups. Because of the ever increasing numbers of "efficient" products on the market, there is still confusion about which products will qualify and how to utilize all of these product choices to achieve cost effective energy savings.
To increase penetration:

- Offer buy-back or bounty programs to remove existing installed base.
- Expand the existing HPT8 incentive program by making free-ridership in the public benefits program acceptable.
- Substantially buy down the cost of high quality LED equipment, far beyond what is acceptable with the current public benefits program.

Barriers:

- HPT8: The existing regular T8 equipment still works fine, hard to justify retrofitting with current energy costs.
- LED: Lack of high quality and high efficiency equipment. Current LED equipment is no more efficient than linear fluorescent but costs way more for the same lighting level.
- LED: Lots of low-quality equipment is flooding the market. This risks a consumer back lash against using the technology in future.

Respondent 9: Biggest barrier is lack of knowledge of availability and lack of peer demonstration sites. Lack of promotion by electrical contractors and supply houses is also a big problem.

21. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: Its hard to predict the penetration 4 and 10 years out for LED lighting where the technology is changing so fast that the current technology won't even be applicable in the years ahead. For NEW CONSTRUCTION, the tightening of lighting codes (when actually enforced) will result in more HPT8 just to meet code – not achieve claimable savings. For this project type, it is not the swap out of technology but a comprehensive view of design that has the real opportunity for significant gain. With proper design, a wide variety of technology (fixture based with HPT8, LED or T5) can be incorporated as well as low ambient light levels and task lighting to achieve significant savings. Also, the penetration of this equipment varies based on type of new construction project – design build has less actual market penetration while a project with a consulting firm has a higher probability of including high efficient product. Answers were given for HPT8's showing a drop based on new and better ways to beat design codes. While programs could continue to impact HPT8 market share at 10 years, with newer approaches they could actually be promoting something that achieves savings but not with the true potential available at that time. For the RETROFIT market, design and redesign can be an important consideration but more of this market is one for one or close to it. For incandescent fixtures, more of those opportunities may be taken away as laws move to eliminate incandescent. In ten years, HPT8 will decrease market penetration as other technologies take their place just as HPT8's are now taking the place of the T8's being promoted ten years ago.

Respondent 2: Policy including the Ballast Efficacy Factor standards phasing out T12 magnetic ballasts will drive a large number of retrofits in the coming years. This is an excellent opportunity with proper programs and education to ensure there are not potential savings left on the table.

Respondent 5: Focusing on the lamps is less than half of the efficiency opportunity. What's missing are good fixtures and designs that result in high quality, even lighting with lighting power densities that are 30 to 60% below allowed maximums in the new code. Almost all of our projects are in this range. This opportunity has been mostly missed in Wisconsin's current programs. The other important opportunity is improved controllability of lighting, including use of stepped daylighting control with photosensors.

Respondent 8: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program. In general, the feeling is that 10 years out some CFL, HPT8 and T5 markets will be replaced by LED lighting.

Respondent 9: Perhaps 50% of commercial space is owned or managed by 40 companies who could effect great change. These are usually multi state corporations and need to be contacted at the national level.

Commercial Lighting Controls

22. In commercial/institutional new construction, what are your estimates of the market share for lighting systems that include automatic daylighting controls under the program scenarios and time periods listed below?

Respondent 1:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	2%	N/A
2012 (in four years)	20%	25%	40%
2018 (in ten years)	50%	60%	80%

Respondent 2:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	10%	N/A
2012 (in four years)	15%	20%	30%
2018 (in ten years)	20%	30%	45%

Respondent 3:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	5	N/A
2012 (in four years)	5	10	20
2018 (in ten years)	15	25	70

Respondent 5:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	10	N/A
2012 (in four years)	15	25	50
2018 (in ten years)	25	40	70

Respondent 7:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	15	N/A
2012 (in four years)	10	20	30
2018 (in ten years)	15	25	35

Respondent 8:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	5%	N/A
2012 (in four years)	5%	10%	20%
2018 (in ten years)	7%	20%	40%

Respondent 9:

	% of lighting in commercial/institutional new construction that include automatic daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current market share)	N/A	10	N/A
2012 (in four years)	20	40	60
2018 (in ten years)	40	60	80

23. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting systems that will have been retrofitted with automatic daylighting controls under the program scenarios and time periods listed below?

Respondent 1:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	<1%	N/A
2012 (in four years)	1%	3%	5%
2018 (in ten years)	2%	5%	8%

Respondent 2:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	3%	N/A
2012 (in four years)	5%	7%	15%
2018 (in ten years)	7%	15%	25%

Respondent 3:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	1	N/A
2012 (in four years)	1	3	7
2018 (in ten years)	3	6	50

Respondent 5:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	1	N/A
2012 (in four years)	2	6	12
2018 (in ten years)	5	15	35

Respondent 7:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	7	N/A
2012 (in four years)	12	15	18
2018 (in ten years)	17	22	25

Respondent 8:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	1%	N/A
2012 (in four years)	2%	5%	10%
2018 (in ten years)	4%	10%	20%

Respondent 9:

	% of existing commercial/institutional lighting retrofitted with daylighting controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	10	20	40
2018 (in ten years)	20	40	60

24. What are your estimates of the cumulative percentage of currently installed commercial/institutional lighting that will have been retrofitted with occupancy sensors or timed controls under the program scenarios and time periods listed below?

Respondent 1:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	30%	N/A
2012 (in four years)	40%	50%	70%
2018 (in ten years)	50%	70%	90%

Respondent 2:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	20%	N/A
2012 (in four years)	25%	30%	50%
2018 (in ten years)	30%	40%	70%

Respondent 3:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	20	N/A
2012 (in four years)	20	35	50
2018 (in ten years)	50	70	95

Respondent 5:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	8	12	20
2018 (in ten years)	12	30	70

Respondent 7:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	12	N/A
2012 (in four years)	10	17	21
2018 (in ten years)	18	22	26

Respondent 8:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	30%	N/A
2012 (in four years)	40%	50%	70%
2018 (in ten years)	50%	70%	90%

Respondent 9:

	% of existing commercial/institutional lighting retrofitted with occupancy sensors or timed controls		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	20	40	60
2018 (in ten years)	40	60	80

25. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			X	

Respondent 2:

Novice 1	2	3	4	Expert 5
X				

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 5:

Novice 1	2	3	4	Expert 5
				5

Respondent 7:

Novice 1	2	3	4	Expert 5
			X	

Respondent 8:

Novice 1	2	3	4	Expert 5
			X	

Respondent 9:

Novice 1	2	3	4	Expert 5
		X		

26. In your opinion, what is the most effective way to increase the rate of penetration of lighting controls in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

Respondent 1: Opportunities in existing facilities for daylighting controls are limited due to design of the structures. Increased opportunities will grow from personal controls of workspace lighting and integration of lighting controls with energy management systems.

Respondent 5: Programs or even code requirements that hit the big space areas with simple requirements makes sense to me. This should continue to get easier with time.

Respondent 8: Daylighting controls probably perceived as a nice “extra” to have, and are one of the first items to be cut or value engineered when the project is over budget. A stronger demand and good examples / case studies of daylighting would help. Also, getting architects and lighting designers to work together more would help.

27. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: For New Construction, daylighting controls have a higher probability in those buildings considering LEED. Percentages were based on perception of expected growth of LEED, level of program interaction with customers looking at efficiency and those incorporating daylighting. Also considered was the increased code requirements and the ability for daylighting to be a useful tool to meet.

Respondent 8: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program.

Respondent 9: I believe that people over estimate the current number of CFL installations in the commercial sector. Halogens still are over used because of the belief that CFLs do not provide the necessary color rendition, sparkle or PUNCH. This is a particular barrier in the retail sales sector.
Dimmable CFL or Cold Cathode have a large potential market in the restaurant, bar or hospitality sector.
Any commercial enterprise with a conference will often have several recessed down lights that could be retrofit with CFLs.

Commercial Refrigeration

28. What are your estimates of the percentage of new refrigeration systems that include/will include ECM motors under the program scenarios and time periods listed below?

Respondent 1: This is becoming a more obvious upgrade choice.

	% of new commercial refrigeration systems that include ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	6	N/A
2012 (in four years)	10	20	30
2018 (in ten years)	20	35	50

Respondent 8:

	% of new commercial refrigeration systems that include ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	7%	N/A
2012 (in four years)	10%	20%	35%
2018 (in ten years)	20%	45%	75%

29. What are your estimates of the percentage of new refrigeration systems that will include high efficiency compressors under the program scenarios and time periods listed below?

Respondent 1: Assuming you mean going to higher-efficiency rack systems instead of multiple condensing units. The compressors in most rack systems are not high-efficiency. I am listing for grocery stores only. Very, very few Convenience stores will use rack systems now and in the future. Also, as grocery stores continue to grow larger and smaller stores continue to close, we should see considerable natural movement toward rack systems over multiple condensing units. Very small stores will still likely remain using condensing units, given space constraints. For rack systems, you can choose to upgrade to higher efficiency compressors – new systems data below.

	% of new commercial refrigeration systems that include high efficiency compressors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	45	N/A
2012 (in four years)	45	50	55
2018 (in ten years)	50	55	60

Respondent 8:

	% of new commercial refrigeration systems that include high efficiency compressors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current market share)	N/A	35%	N/A
2012 (in four years)	40%	45%	50%
2018 (in ten years)	50%	55%	70%

30. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will be retrofitted with ECM motors under the program scenarios and time periods listed below?

Respondent 1: Note: most-aggressive would be a low-cost install program.

	% of existing commercial refrigeration equipment retrofitted with ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	3	N/A
2012 (in four years)	1	6	20
2018 (in ten years)	10	20	60

Respondent 8:

	% of existing commercial refrigeration equipment retrofitted with ECM motors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10%	N/A
2012 (in four years)	15%	20%	40%
2018 (in ten years)	20%	40%	65%

31. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with high efficiency compressors under the program scenarios and time periods listed below?

Respondent 1: Real life is much more dynamic than can be explained below. As stores increase in size, the trend is to change from inefficient multiple condensing units to rack systems (small mom-and-pop stores). For medium to large stores, they already have rack systems and you would need to look at the rack system itself for compressor upgrade opportunities – for example, upgrading to multiplex compressors. Only on rare/odd occasions would an existing rack be “retrofitted” with a dissimilar higher-efficiecny single compressor. It is usually an all or nothing replacement. Below is perspective on upgrading all compressors in a rack system. Upgrading means shut down, which means problems in the grocery business. Grocers are more apt to maintain existing equipment and replace one piece at a time with the same type and size.

	% of existing commercial refrigeration equipment retrofitted with high efficiency compressors		
	In the absence of state or utility programs	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	35	N/A
2012 (in four years)	35	36	37
2018 (in ten years)	36	37	38

Respondent 8:

	% of existing commercial refrigeration equipment retrofitted with high efficiency compressors		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	20%	N/A
2012 (in four years)	25%	35%	45%
2018 (in ten years)	30%	45%	65%

32. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with anti-sweat controls, doors, or strip curtains under the program scenarios and time periods listed below?

Respondent 1: Most-aggressive = install program. I believe this is much lower than the 2005 study findings.

	% of existing commercial refrigeration equipment retrofitted with anti-sweat controls, doors, or strip curtains		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	35	N/A
2012 (in four years)	37	55	75
2018 (in ten years)	45	75	90

Respondent 8:

	% of existing commercial refrigeration equipment retrofitted with anti-sweat controls, doors, or strip curtains		
	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	55	65	75
2018 (in ten years)	60	70	90

33. What are your estimates of the cumulative percentage of currently installed refrigeration systems that will have been retrofitted with ambient sub-cooling under the program scenarios and time periods listed below?

	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	15	N/A
2012 (in four years)	15	17	19
2018 (in ten years)	17	22	25

Respondent 8:

	In the absence of state or utility programs	Under existing program approaches and funding	Under the most aggressive possible program approaches and funding
2008 (current installed base)	N/A	55%	N/A
2012 (in four years)	60%	65%	70%
2018 (in ten years)	70%	75%	80%

34. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			x	

Respondent 8:

Novice 1	2	3	4	Expert 5
	X			

35. In your opinion, what is the most effective way to increase the rate of penetration of refrigeration efficiency measures in Wisconsin? What are the key barriers (other than cost) preventing greater market penetration of these technologies?

Respondent 1: Shut down is a big problem with refrigeration in grocery stores. Grocers cannot have refrigeration go down and still stay open. That said, for existing buildings focus on projects we can influence that do not completely shut down the whole (or majority of) their refrigeration system. New Construction should be more streamlined and more responsive by using general savings impact by measure type (ex: % savings expectations) instead of having to isolate specific details of each complex measure of the project – this holds projects up and causes program avoidance. Continue to help give awareness through trade allies and incentive program.

Respondent 8:
Increase the rate:
- Decreasing cost and increasing quality of these measures
- Incentive program offering $ for installation of these measures

Barriers:
- Lack of awareness of the technology and its benefits (particularly in smaller stores; the large grocery/C-store chains are already well informed)

36. Is there anything else we should know about this market or why you provided the responses above?

Respondent 1: Grocers are a time-constrained group and have little time to think ahead about energy efficiency projects. Much has to come from recommendations from a trade ally, one-on-one meetings, word-of-mouth, or consumer groups that they trust. Once grocers understand the impact of an energy efficient measure, it is much easier to convince them to move forward with a project. Getting their attention long enough to have them understand the impact is the difficulty.

Respondent 8: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program. It's the smaller businesses that are under-participating in refrigeration energy efficiency measures. The large chains are quite progressive. Large chains have energy efficiency experts on staff. Small businesses are often unaware of the technologies and their benefits.

Industrial Delphi Responses

Respondent 8:
Overall Comments: Upon reviewing the reported responses to the Commercial/Institutional and Industrial Delphi survey it is evident by the wide range of answers that respondents were basing them on very different interpretations and assumptions. One item subject to interpretation that runs throughout the survey is the answers for “in the absence of state or utility programs”. Some respondents appear to have interpreted this as though there have never been any energy efficiency programs in Wisconsin or that the current program would not have a residual impact in the future. Our respondents for the Commercial/Institutional, and Industrial surveys made the following interpretation – past programs indeed existed and had impacts but that current programs end now, then estimates are provided looking ahead 4 years.

While it is not possible for the potential study to evaluate future impacts of all possible technologies, there does seem to be one glaring omission. That would be the area of improving energy efficiency in data centers. Within the state of Wisconsin and nationally there is much interest in this topic and initial estimates indicate large amounts of energy efficiency potential associated with data centers.

While we believe there are opportunities for tremendous energy savings impacts, they may not necessarily all come from today's energy efficiency measures. Some of the technologies will become more pervasive in the marketed place in the future due to inertia created by the current program, federal standards, or local building codes.

Motors

1. What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systematic approach to motor management?

Respondent 2: 5%

Respondent 4: 25%

Respondent 6: 40%

Respondent 9: 10-20%

2. Of the current stock of motors installed in Wisconsin industrial facilities, what is your estimate of the percentage meeting NEMA Premium standards under the program scenarios and time periods listed below?

Respondent 2:

	Installation of NEMA Premium motors (% of installed base)					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
Year	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)
2008 (current)	N/A	N/A			N/A	N/A
2012 (in four years)	20	20	25	25	40	40
2018 (in ten years)	40	40	50	50	60	60

Respondent 4:

	Installation of NEMA Premium motors (% of installed base)					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
Year	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)
2008 (current)	N/A	N/A	75	60	N/A	N/A
2012 (in four years)	N/A	N/A	100	95	100	95
2018 (in ten years)	N/A	N/A	100	95	100	95

Respondent 6:

	Installation of NEMA Premium motors (% of installed base)					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
Year	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)	Small (≤50 hp)	Large (>50 hp)
2008 (current)	N/A	N/A	50	40	N/A	N/A
2012 (in four years)	55	45	55	45	60	53
2018 (in ten years)	60	50	65	55	70	60

Respondent 8: Most questions related to market penetration of NEMA Premium Motors are soon to be moot point. As part of the recently enacted Energy Independence and Security Act (EISA), with very few exclusions all 3-phase motors manufactured after December 2009 will have to meet the NEMA Premium standards. This may change, however moving into 2010 major motor manufacturers are currently reluctant to commit to a new, higher NEMA motor rating standard (i.e. – ultra-Premium or the like).

Respondent 9:

	Installation of NEMA Premium motors (% of installed base)					
	In the absence of state or utility programs		Under existing program approaches and funding		Under the most aggressive possible program approaches and funding	
Year	**Small (≤50 hp)**	**Large (>50 hp)**	**Small (≤50 hp)**	**Large (>50 hp)**	**Small (≤50 hp)**	**Large (>50 hp)**
2008 (current)	N/A	N/A	<5%	<1%	N/A	N/A
2012 (in four years)	10	10	10-20%	10	20-30%	10-20%
2018 (in ten years)	10	10	10-20%	20	20-30%	20

3. For the motor size categories listed below, please provide your estimate of typical rewind practices in the Wisconsin industrial market.

Respondent 2:
- Below 125 hp:
  25% rewound at failure
  Rewound ___1 times before replacement (on average)
- 125 hp or larger:
  50% rewound at failure
  Rewound _2__ times before replacement (on average)

Respondent 4:
- Below 125 hp:
  10% rewound at failure
  Rewound 1 time before replacement (on average)
- 125 hp or larger:
  30% rewound at failure
  Rewound 2 times before replacement (on average)

Respondent 6:
- Below 125 hp:
  75% rewound at failure
  Rewound 1.3 times before replacement (on average)
- 125 hp or larger:
  75% rewound at failure
  Rewound 1.5 times before replacement (on average)

Respondent 9:
- Below 125 hp:
  80-90% rewound at failure
  Rewound 2 time before replacement (on average)
- 125 hp or larger:
  95% rewound at failure
  Rewound 2 times before replacement (on average)

4. In your view, would industrial facilities in Wisconsin benefit from additional energy efficiency program resources to support best practices for motor management/repair? If so, what kind of program resources/support would be most beneficial?

Respondent 2: Increased incentives and getting the word out

Respondent 4: Due to EISA, the market will move without the need for program impacts.

Respondent 6: Technical support from a motors program

Respondent 9: Larger customers that use efficiency programs as part of plan replace motors instead of rewind has been successful. Without plan motors get rewind instead of replacement.

5. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	**2**	**3**	**4**	**Expert 5**
			x	

Respondent 4:

Novice 1	**2**	**3**	**4**	**Expert 5**
		X		

Respondent 6:

Novice 1	**2**	**3**	**4**	**Expert 5**
		X		

Respondent 9:

Novice 1	**2**	**3**	**4**	**Expert 5**
			x	

6. Is there anything else we should know about this market or why you provided the responses above?

Respondent 5: Small gains in efficiency from the actual motor indicate there should be a much larger focus on the systems…possible increased premium efficiency incentives coupled with SYSTEM improvement…whether it is controls, vfd, or any other optimization.

Compressed Air

7. What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systems-based approach to managing compressed air systems?

Respondent 2: 20%

Respondent 4: 20%

Respondent 5: 15%

Respondent 6: 50%

Respondent 9: 1-3%

8. What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to compressed air systems under the program scenarios and time periods listed below?

Respondent 2:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	20	10	20	20
2018 (in ten years)	40	20	40	40

Respondent 4:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	10%	20%	30%	10%
2018 (in ten years)	20%	25%	35%	15%

Respondent 5:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	10	5	5	10
2018 (in ten years)	15	10	10	15

Respondent 6:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	55	25	30	40
2018 (in ten years)	65	40	45	60

Respondent 9:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	10	5	5	5
2018 (in ten years)	10-20%	10	10	10

Respondent 2:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	15	10	10	5
2012 (in four years)	20	20	20	10
2018 (in ten years)	40	40	40	30

Respondent 4:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	10%	15%	20%	10%
2012 (in four years)	20%	25%	40%	15%
2018 (in ten years)	30%	30%	55%	20%

Respondent 5:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	15	10	15	10
2012 (in four years)	25	15	20	15
2018 (in ten years)	35	20	25	20

Respondent 6:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	58	30	35	45
2012 (in four years)	70	45	50	50
2018 (in ten years)	77	55	60	60

Respondent 9:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	10	10	5	5
2012 (in four years)	20-30	10-20	10-20	10-20
2018 (in ten years)	30-40	20-30	20-30	20-30

Respondent 2:

Scenario 3	**Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	25	25	20	25
2018 (in ten years)	50	50	40	50

Respondent 4:

Scenario 3	**Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…**			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	40%	35%	60%	25%
2018 (in ten years)	60%	50%	70%	35%

Respondent 5:

Scenario 3	Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	30	20	20	20
2018 (in ten years)	35	25	25	30

Respondent 6:

Scenario 3	Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	80	55	60	60
2018 (in ten years)	85	65	70	70

Respondent 9:

Scenario 3	Under the most aggressive possible program approaches and funding, what % of industrial facilities will have…			
Year	**Conducted audit and implemented O&M improvements**	**Installed improved compressor controls**	**Installed VSD for compressor motor**	**Upgraded to high-efficiency compressor**
2008 (current)	N/A	N/A	N/A	N/A
2012 (in four years)	30-40	20-30	20-30	20-30
2018 (in ten years)	40-50	30-40	30-40	30-40

9. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 2:

Novice 1	2	3	4	Expert 5
				x

Respondent 4:

Novice 1	2	3	4	Expert 5
		X		

Respondent 5:

Novice 1	2	3	4	Expert 5
			4	

Respondent 6:

Novice 1	2	3	4	Expert 5
		x		

Respondent 9:

Novice 1	2	3	4	Expert 5
		x		

10. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: Increase incentives and getting the word out

Respondent 4: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program.

Respondent 5: Substantial incentives elevate awareness and actions.

Boilers & Steam Systems

11. What is your estimate of the percentage of Wisconsin industrial facilities that take a comprehensive, systems-based approach to managing boilers and steam systems?

Respondent 1: 30%

Respondent 4: 25%

Respondent 5: 23%

Respondent 9: <10%

12. What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to boilers and steam systems under the program scenarios and time periods listed below?

Respondent 1:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	50	20	5	10
2018 (in ten years)	70	40	15	25

Respondent 4:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	35%	10%	10%	10%
2018 (in ten years)	45%	15%	15%	15%

Respondent 5:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	30	25	20	25
2018 (in ten years)	35	30	25	30

Respondent 9:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	50-60	10	10	5
2018 (in ten years)	50-60	10-20	10-20	10

Respondent 1:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	30	10	2	5
2012 (in four years)	60	30	10	20
2018 (in ten years)	80	50	20	35

Respondent 4:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	30%	10%	20%	8%
2012 (in four years)	45%	17%	25%	13%
2018 (in ten years)	60%	25%	30%	20%

Respondent 5:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	35	30	25	20
2012 (in four years)	40	35	30	28
2018 (in ten years)	45	40	35	33

Respondent 9:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	50-60	10-20	10	5
2012 (in four years)	50-60	20	20	10
2018 (in ten years)	50-60	30	30	20

Respondent 1:

Scenario 3	**Under the <u>most aggressive possible</u> program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	70	50	40	30
2018 (in ten years)	90	80	80	75

Respondent 4:

Scenario 3	**Under the <u>most aggressive possible</u> program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	60%	25%	45%	20%
2018 (in ten years)	80%	50%	65%	30%

Respondent 5:

Scenario 3	**Under the <u>most aggressive possible</u> program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	45	40	35	30
2018 (in ten years)	50	45	40	35

Respondent 9:

Scenario 3	**Under the <u>most aggressive possible</u> program approaches and funding, what % of industrial facilities will have…**			
Year	**Performed steam trap maintenance**	**Installed boiler controls (e.g., reset controls, O2 trim controls)**	**Installed VSD for boiler distribution pumps and draft fans**	**Upgraded to energy-efficient boiler**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	70-80	30-40	30	20
2018 (in ten years)	80-90	40-50	40	30

13. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		X		

Respondent 4:

Novice 1	2	3	4	Expert 5
		X		

Respondent 5:

Novice 1	2	3	4	Expert 5
			4	

Respondent 9:

Novice 1	2	3	4	Expert 5
				x

14. Is there anything else we should know about this market or why you provided the responses above?

Respondent 4: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program.

Respondent 5: Steam trap, and control improvements are most effective, the VFD for pumps and fans should be applied separately and possibly increased when coupled with and control improvements.

Pump Systems

15. What is your estimate of the percentage of Wisconsin industrial facilities that will have implemented the following efficiency improvements to pump systems under the program scenarios and time periods listed below?

Respondent 1:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	15	5	10
2018 (in ten years)	40	15	30

Respondent 4:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	15%	10%	25%
2018 (in ten years)	30%	20%	45%

Respondent 5:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	20	10	10
2018 (in ten years)	25	12	15

Respondent 9:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	5	5	10
2018 (in ten years)	10	10	20

Respondent 1:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	30	5	20
2012 (in four years)	50	10	35
2018 (in ten years)	70	15	50

Respondent 4:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	20%	10%	25%
2012 (in four years)	40%	20%	50%
2018 (in ten years)	60%	35%	75%

Respondent 5:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	20	10	10
2012 (in four years)	30	12	20
2018 (in ten years)	40	15	25

Respondent 9:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	10-20	5-10	10
2012 (in four years)	20-30	10-15	20
2018 (in ten years)	30-40	15-20	30

Respondent 1:

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	70	30	50
2018 (in ten years)	90	70	90

Respondent 4:

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have…**		
Year	**Conducted audit and implemented O&M improvements**	**Trimmed the impeller to match system demand**	**Installed VSD for pump motor**
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	60%	50%	75%
2018 (in ten years)	80%	65%	90%

Respondent 5:

Scenario 3	Under the most aggressive possible state or utility programs, what % of industrial facilities will have…		
Year	Conducted audit and implemented O&M improvements	Trimmed the impeller to match system demand	Installed VSD for pump motor
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	35	15	25
2018 (in ten years)	40	18	30

Respondent 9:

Scenario 3	Under the most aggressive possible state or utility programs, what % of industrial facilities will have…		
Year	Conducted audit and implemented O&M improvements	Trimmed the impeller to match system demand	Installed VSD for pump motor
2008 (current installed base)	N/A	N/A	N/A
2012 (in four years)	20-30	10-20	20-30
2018 (in ten years)	30-40	20-30	30-40

16. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			X	

Respondent 4:

Novice 1	2	3	4	Expert 5
	X			

Respondent 5:

Novice 1	2	3	4	Expert 5
			4	

Respondent 9:

Novice 1	2	3	4	Expert 5
				x

17. Is there anything else we should know about this market or why you provided the responses above?

Respondent 4: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program.

Respondent 5: VSD MUST include adequate controls, there must be a large focus on OPIMIZATION and not just VFD or controls.

Lighting

18. Of the current stock of light fixtures installed in Wisconsin industrial facilities, what is your estimate of the percentage that will have been replaced with energy-efficient technologies under the program scenarios and time periods listed below?

Respondent 1:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	5	10	10	1
2018 (in ten years)	10	40	40	5

Respondent 2:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	5	15	2	1
2018 (in ten years)	15	25	2	2

Respondent 3:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	5%	15%	25%	0%
2018 (in ten years)	10%	35%	8%	2%

Respondent 4:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	10	15	10	1
2018 (in ten years)	15	20	15	3

Respondent 6:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	20	16	12	8
2018 (in ten years)	25	20	16	12

Respondent 9:

Scenario 1	**In the absence of state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the following technologies**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	<5	50	0	<1
2018 (in ten years)	<10	70-80	0	5-10

Respondent 1:

Scenario 2	**Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	5	20	10	0
2012 (in four years)	10	40	30	1
2018 (in ten years)	15	60	50	5

Respondent 2:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	3	20	2	1
2012 (in four years)	10	35	2	2
2018 (in ten years)	15	50	2	4

Respondent 3:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	5%	5%	5%	0%
2012 (in four years)	10%	21%	10%	1%
2018 (in ten years)	10%	20%	10%	3%

Respondent 4:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	5	15	10	0
2012 (in four years)	15	25	15	1
2018 (in ten years)	20	30	20	5

Respondent 6:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	27	22	16	11
2012 (in four years)	33	27	20	15
2018 (in ten years)	40	33	25	22

Respondent 9:

Scenario 2	Under existing program approaches and funding, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	<1	40-50	<10	<1
2012 (in four years)	3-5	60-80	<5	3-5
2018 (in ten years)	5-10	70-80	<5	5-10

Respondent 1:

Scenario 3	Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	10	60	50	1
2018 (in ten years)	15	80	80	20

Respondent 2:

Scenario 3	Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	15	50	2	2
2018 (in ten years)	20	75	2	3

Respondent 3:

Scenario 3	Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	10%	20%	5%	5%
2018 (in ten years)	10%	40%	5%	5%

Respondent 4:

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	20	30	20	1
2018 (in ten years)	30	35	20	5

Respondent 6:

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	38	33	25	19
2018 (in ten years)	45	40	32	28

Respondent 9:

Scenario 3	**Under the most aggressive possible state or utility programs, what % of industrial facilities will have upgraded inefficient lighting to the technologies below**			
Year	**High Output T5s (high bay lighting)**	**Other efficient fluorescents**	**Pulse Start Metal Halide**	**LEDs**
2008 (current installed base)	N/A	N/A	N/A	N/A
2012 (in four years)	10-15	70-80	<5	10
2018 (in ten years)	15-20	80-90	<10	20

19. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

Respondent 2:

Novice 1	**2**	**3**	**4**	**Expert 5**
				x

Respondent 3:

Novice 1	**2**	**3**	**4**	**Expert 5**
		x		

Respondent 4:

Novice 1	2	3	4	Expert 5
			x	

Respondent 6:

Novice 1	2	3	4	Expert 5
		x		

Respondent 9:

Novice 1	2	3	4	Expert 5
				x

20. Is there anything else we should know about this market or why you provided the responses above?

Respondent 2: Large incentives with the ability to obtain low cost financing of the project.

Respondent 3: In our the market share of High Bay Fluorescents is not nearly at the level that 2006 Focus Study would suggest – our experience is that the market has not been nearly penetrated to the degree that the Focus Study would suggest. It is true High Bay Fluorescents fixtures – probably made up a large portion of the lighting applications but that by no means should be construed as an indication of market share. Furthermore, we would argue that T5 High Output fixtures are not the best option for commercial/ industrial lighting options because they suffer from some of the same point source and light puddling issues that HID fixtures suffer from and that T8 Fluorescent High Bays are the best interior commercial/industrial lighting options. Furthermore, the non-standard lengths and heat issues associated with T5 fixtures also make them less attractive options than T8 Fluorescent High Bays. Finally, T8 High Bay fluorescent fixtures have been proven in field experience to outperform HID and T5 fixtures in many commercial/industrial applications.

Respondent 4: Estimates based on information provided by engineers and market channel personnel that work on the current Focus Business Program.

Respondent 9: If LED's have manufactures get competitive with quality fixtures, then LED's share of market increases.

21. In your opinion, what are the greatest opportunities for process-related efficiency improvement for Wisconsin industrial facilities?

Respondent 5: Process Air handling, Heating and drying and pumping.

Respondent 9: There are many and saving can be sizeable. The greatest opportunity occurs when energy efficiency engineering plans are done in the retooling plans.

Manufacturing Processes

25. Is there anything else we should know about this market or why you provided the responses above?

Respondent 7: Most industrial programs are offered within the context of the manufacturing process. However, a large fraction of the energy use is in nonmanufacturing or process consumption. This includes the office space, meeting space, food service facilities and the exterior lighting. Roofing is another overlooked aspect of the energy savings potential. Energy Star roofing is under utilized in Wisconsin.

Respondent 9: Based on historic results, in a five year period, about 1/3 of industrial customers will do some sort of process improvement. The other 2/3 of customers would have either completed new production/process lines or are on the end of product life cycle or in slow economic cycle for the production.

Further Opinion (optional)

26. In your opinion, what is the most effective way for program administrators to promote energy efficiency improvement in the industrial market?

Respondent 2: Yes, we have presented our ideas to the PSC.

Respondent 4: A two pronged approach of providing the technical expertise to plant managers through program staff (energy advisors) or trade allies, and building relationships with higher level financial/administrative executives to understand the drivers that influence capital investment decisions. This approach can be used on a company-by-company basis, or more efficiently, through trade associations.

Respondent 5: Shared cost studies and walk thru awareness visits (not quite an energy audit).

Respondent 7: Need more demonstration sites among peers that could be used for promotion. Need to install more demonstration equipment.

Respondent 9: Work with companies to have a near and long term energy efficiency plan.

27. Thinking ‘outside of the box’, are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in the industrial market?

Respondent 4: Focus has recently introduced several new approaches, such as staffing grants for dedicated technical resources or shared resources through an association, promotional RFP's to stimulate activity within a cluster, emerging technology technical and financial assistance, best practice energy efficiency loans, and energy efficiency training programs. New "outside of the box" innovative programs will be necessary to cost effectively penetrate the small to medium size industrial companies. Branded energy efficient industrial parks may be one tactic. Community based programs that include an industrial component may also help. The current industrial program is very focused on named clusters. Any innovations that would uncover energy efficiency opportunities outside of the traditional clusters would help to expand the market.

Respondent 5: Shared cost studies with minimal up front cost and a hook to implement a certain amount.

Respondent 7:
Wisconsin has many manufacturers who are Energy Star partners. They manufacture such items as dehumidifiers, lighting supplies, clothes washers and commercial refrigeration equipment. When they signed on as a partner, the Corporation agreed as part of being an Energy Star Partnership that they would install energy efficiency measures in their facility. The Wisconsin Energy Star Partners should be assigned a contact person who would assist them to install Energy Star office equipment, commercial kitchen equipment for the cafeteria, vending machines, lighting such as CFLs in hallways, conference rooms and offices.

Respondent 9: Incent for efficiency plans and goals that are actionable by the company's managers.

28. Are there energy efficiency measures offering substantial opportunities for reducing industrial energy consumption that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?

Respondent 4: For large industrial facilities, daylighting could offer substantial energy savings, as most facilities like this are a large box with no windows. Using current best practices from the retail industry (large skylights and daylighting controls) would be an idea.

Respondent 5: LEAN manufacturing, reduced waste, and tracking/analyzing manufacturing metrics related to energy on a regular basis.

Respondent 7: Now that motors have been addressed by the National Energy Act, there needs to be additional promotion at a higher tier level at 2 efficiency levels above the current standard. More needs to be done to promote higher efficiency low horsepower motors including their incorporation into OEMs. Variable speed drives and ECMs are under utilized. There should be a massive retrofit of power transformers to reduce losses as power enters the facility.

29. What are the key barriers to broader adoption of energy-efficient technologies and practices in the industrial market?

Respondent 2: Lack of understanding and resources.

Respondent 4: Internal competition for capital dollars and getting companies to spend time thinking about energy efficiency remain barriers.

Respondent 5: 1. Lack of Capital 2. Process interruption.

Respondent 7: Most decisions are made as capitol improvement and so are long, involve many players and convoluted. The improvements that could be considered as maintenance are overlooked. Lighting retrofits should be marketed as maintenance expenditures. Many opportunities are lost because equipment replacement is a replace on failure only such as motors, water heaters and lighting. Need to work with contractors, suppliers and distributors. The goal should be that no motor is ever sold by a distributor or supplier that is not high efficiency. The distributor or supplier needs to be able to offer the incentive.

Respondent 9: Long payback.

30. Is there any additional information you would like to provide to inform estimates of achievable efficiency potential in the industrial market?

Respondent 5: Efficiency Must be coupled with conservation and all must be included in the social responsibility, increased awareness on these issues must happen.

Agriculture Delphi Responses

Dairy Industry - General

1. Studies have attempted to approximate the distribution of electricity consumption by end use on Wisconsin's dairy farms. Please provide your estimate of future trends by listing the percentage share of electricity consumption by end use, present and future, for all dairy farms in Wisconsin, regardless of individual size. Please add additional categories under 'other' if needed. Each column representing a time period should sum to 100 percent.

Respondent 1:

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration	25	30	30
Vacuum/Milk Pumps	20	20	20
Ventilation	12	10	10
Interior Lighting	10	15	15
Exterior Lighting	5	5	5
Manure Management	5	10	10
Other 1: Water Heating	15	10	10
Other 2: General	8		
SUM:	100%	100%	100%

Respondent 2:

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration	40	35	35
Vacuum/Milk Pumps	20	15	10
Ventilation	10	15	15
Interior Lighting	10	15	15
Exterior Lighting	1	1	1
Manure Management	4	4	4
Other 1: Water heating	10	5	5
Other 2: Misc	5	10	15
SUM:	100%	100%	100%

Respondent 3:

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration	20	20	20
Vacuum/Milk Pumps	20	20	20
Ventilation	15	15	15
Interior Lighting	15	15	15
Exterior Lighting	5	5	5
Manure Management	5	7.5	7.5
Other 1: Water heating	10	12.5	12.5
Other 2: Misc	10	5	5
SUM:	100%	100%	100%

Respondent 4:

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration	20	20	20
Vacuum/Milk Pumps	25	25	25
Ventilation	15	15	15
Interior Lighting	14	14	14
Exterior Lighting	1	1	1
Manure Management	5	5	10
Other 1: Water heating	20	20	15
Other 2:			
SUM:	100%	100%	100%

Respondent 5:

	Current and Future End Use Energy Consumption on Dairy Farms		
Year	**Now (2008)**	**2012**	**2018**
Milk Refrigeration	43	43	43
Vacuum/Milk Pumps	20	20	20
Ventilation	15	15	15
Interior Lighting	10	10	10
Exterior Lighting	2	2	2
Manure Management	10	10	10
SUM:	100%	100%	100%

Respondent 6: Refer to NYS Dairy http://www.nyserda.org/publications/dairyfarmenergysummary.pdf for energy distribution on dairy farms. Based on report energy efficient farm would use less than 750 kWh/cow/yr. Vacuum pump – 50 kWh/cow-milking-yr (2 milking per day = 100 kWh/cow/yr). Refrigeration-milk cooling – 0.7 kWh/cwt

Trends –

- vacuum pump energy use will decrease with implementation of VSD. Need to use vacuum pump about 6-8 hr/day to be economical (4-5 yr simple payback)
- Use of fans will increase
- Use of lights will increase

- Hot water use will increase
- Every farm should have a refrigeration heat recovery unit
- more pumping of manure but will often happen before 8 AM or after 8 PM
- Increased use of automatic manure scrapers (1 to 5HP motors) Run on time clocks ~ every 3-4 hour during summer and once per hour winter.

Dairy Industry – VSDs:
Vacuum and Milk Pumps, Small versus Medium/Large Scale Operations

2. In your opinion, what percentage of SMALL, MEDIUM and LARGE scale dairy farms will operate MILKING PARLORS over the time periods listed below? Consider both new construction and the addition of parlor-based milking systems by retrofitting existing structures.

Respondent 1:

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)	20	45	90
2012 (in four years)	30	75	100
2018 (in ten years)	50	85	100

Respondent 2:

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)	60	85	100
2012 (in four years)	70	100	100
2018 (in ten years)	80	100	100

Respondent 3:

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)	15	65	95
2012 (in four years)	15	75	95
2018 (in ten years)	15	85	100

Respondent 4:

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)	10	75	99
2012 (in four years)	10	85	99
2018 (in ten years)	10	95	99

Respondent 5:

	Market share (% of farms having milking parlors)		
Year	**SMALL (<100 milking cows)**	**MEDIUM (100-200 milking cows)**	**LARGE (>200 milking cows)**
2008 (current market share)	5	50	75
2012 (in four years)	5	55	80
2018 (in ten years)	5	60	85

Respondent 6: There will be an increase use of parlors in the small and medium size farm, All large dairies will have a parlor. As farms adapt parlors their size will often increase.

3. What are your estimates for the market share of variable speed drives (VSDs) used to power MILK and/or VACUUM PUMPS on Wisconsin's SMALL (100 or fewer milking cows) scale dairy operations under the program scenarios and time periods listed below?

Respondent 1:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	35	N/A
2012 (in four years)	35	40	50
2018 (in ten years)	35	50	55

Respondent 2:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	50	80
2018 (in ten years)	45	70	90

Respondent 3:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	25	N/A
2012 (in four years)	25	40	60
2018 (in ten years)	35	60	80

Respondent 4:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40	N/A
2012 (in four years)	40	50	60
2018 (in ten years)	45	60	75

Respondent 5:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	2	N/A
2012 (in four years)	2	4	10
2018 (in ten years)	2	5	15

Respondent 6: Very few – a 5 HP vacuum pump will require 8 hours of use for a 4-5 year simple payback with a VFD.

4. What are your estimates for the market share of variable speed drives (VSDs) used to power MILK and/or VACUUM PUMPS on Wisconsin's MEDIUM and LARGE scale dairy operations (over 100 milking cows) under the program scenarios and time periods listed below?

Respondent 1:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	45	N/A
2012 (in four years)	45	65	80
2018 (in ten years)	50	70	90

Respondent 2:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40	N/A
2012 (in four years)	45	60	80
2018 (in ten years)	50	80	95

Respondent 3:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	25	N/A
2012 (in four years)	25	50	75
2018 (in ten years)	35	75	100

Respondent 4:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	65	N/A
2012 (in four years)	75	80	85
2018 (in ten years)	80	90	95

Respondent 5:

	Market share (% of farms utilizing VSD technology on MILK and/or VACUUM PUMPS)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	15	N/A
2012 (in four years)	15	20	70
2018 (in ten years)	15	25	80

Respondent 6: Most large farms will have a VFD vacuum pump unless they are concerned about stray voltage. Medium sized farms will depend on hours of milking and size of vacuum pump. Many farms have larger vacuum pumps than required.

5. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
			x	

Respondent 2:

Novice 1	2	3	4	Expert 5
			X	

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 4:

Novice 1	2	3	4	Expert 5
				x

Respondent 5:

Novice 1	2	3	4	Expert 5
				5

Respondent 6:

Novice 1	2	3	4	Expert 5
				XX

Dairy Industry – High Efficiency Ventilation Fans

6. Research shows that adding ventilation promotes a healthier living environment for milking cows and may therefore boost milk production. Please estimate current and future use of ventilation for each size class of farm, regardless of fan efficiency rating. Consider 'the use of' to encompass an adequate deployment of fans, such that the majority of housing floor space is ventilated.

Respondent 1:

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	30	50	75
2012 (in four years)	35	55	80
2018 (in ten years)	45	60	90

Respondent 2:

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	30	70	98
2012 (in four years)	40	80	98
2018 (in ten years)	50	90	98

Respondent 3:

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	25	50	75
2012 (in four years)	20	50	75
2018 (in ten years)	15	50	75

Respondent 4:

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	50	60	70
2012 (in four years)	60	70	80
2018 (in ten years)	70	80	90

Respondent 5:

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	25	50	90
2012 (in four years)	35	60	90
2018 (in ten years)	45	70	90

Respondent 6: There will be an increase in the use of cross ventilated barns on large farms requiring large numbers of fans.

	Percentage of Dairy Farms with Adequate Ventilation, Current and Future Usage by Farm Size		
Year	**Small**	**Medium**	**Large**
2008	50	75	100
2012 (in four years)			
2018 (in ten years)			

7. What are your estimates for the market share of High Volume Low Speed (HVLS) ventilation fans on Wisconsin's SMALL scale (100 or fewer milking cows) dairy operations under the program scenarios and time periods listed below?

Respondent 1:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	20	N/A
2012 (in four years)	25	40	50
2018 (in ten years)	30	40	55

Respondent 2:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	5	10	10
2018 (in ten years)	10	15	15

Respondent 3:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	0	N/A
2012 (in four years)	0	10	15
2018 (in ten years)	0	15	20

Respondent 4:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	7	10	12
2018 (in ten years)	10	15	20

Respondent 5:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	2	N/A
2012 (in four years)	0	2	4
2018 (in ten years)	0	2	6

8. What are your estimates for the market share of High Volume Low Speed (HVLS) ventilation fans on Wisconsin's MEDIUM and LARGE scale dairy operations (over 100 milking cows) under the program scenarios and time periods listed below?

Respondent 1:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	45	55
2018 (in ten years)	35	50	60

Respondent 2:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	20	N/A
2012 (in four years)	10	30	40
2018 (in ten years)	15	40	50

Respondent 3:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	5	10	25
2018 (in ten years)	5	15	40

Respondent 4:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	15	N/A
2012 (in four years)	17	20	30
2018 (in ten years)	25	30	40

Respondent 5:

	Market share (% of farms utilizing HVLS fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	2	10	40
2018 (in ten years)	2	10	50

Respondent 6: Based on air flow studies, HVLS fans do not produce as high of velocities of air flow as high speed fans. Because of this there are questions by producers and consultants whether these fans do as good of a job in reducing heat stress and reducing milk production losses/decreases during heat events. This has to do with the placement of the fans down the center of the barn versus over the cow beds.

9. What are your estimates for the market share of high efficiency (HE) ventilation fans (other than HVLS and at lest 21 CFM per watt efficiency rating) on dairy farms, regardless of size?

Respondent 1:

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40	N/A
2012 (in four years)	45	55	70
2018 (in ten years)	45	60	75

Respondent 2:

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	20	N/A
2012 (in four years)	10	40	60
2018 (in ten years)	20	60	80

Respondent 3:

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	15	40
2018 (in ten years)	15	25	60

Respondent 4:

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	40	45
2018 (in ten years)	40	50	55

Respondent 5:

	Market share (% of farms utilizing HE fans)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	50	70	90
2018 (in ten years)	60	75	95

Respondent 6: No way to estimate this without doing farm surveys to get inventory of fans and compare to BESS Lab data.

10. Regardless of the size of the operation, what percentage of farms routinely maintain ventilation fans (consider periodic maintenance to include cleaning shutters, checking belt tension, etc)?

Respondent 1:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**25**	**40**	**10**

Respondent 2:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**30**	**60**	**10**

Respondent 3:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**75**	**15**	**10**

Respondent 4:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**30**	**65**	**5**

Respondent 5:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**80**	**15**	**5**

Respondent 6:

	Percentage of Farms Practicing Routine Maintenance on Ventilation Fans		
Frequency of Maintenance	**Never**	**Somewhat (around 50 percent of recommended levels)**	**Frequently**
Percentage Adherence	**85**	**15**	**0**

11. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		x		

Respondent 2:

Novice 1	2	3	4	Expert 5
			X	

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 4:

Novice 1	2	3	4	Expert 5
				x

Respondent 5:

Novice 1	**2**	**3**	**4**	**Expert 5**
				5

Respondent 6:

Novice 1	**2**	**3**	**4**	**Expert 5**
				xx

Dairy Industry – Pre-Cooling, Refrigeration and Waste Heat Recovery

12. What are your estimates of the use of inline well water pre-coolers on SMALL scale dairy operations (100 milking cows or less) under the program scenarios and time periods listed below?

Respondent 1:

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	25	N/A
2012 (in four years)	25	35	50
2018 (in ten years)	25	40	60

Respondent 2:

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	45	55
2018 (in ten years)	40	60	75

Respondent 3:

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	25	N/A
2012 (in four years)	25	50	65
2018 (in ten years)	25	75	95

Respondent 4:

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	31	35	35
2018 (in ten years)	33	40	45

Respondent 5:

	Usage of Well Water Pre-Coolers (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	50	60	80
2018 (in ten years)	50	70	90

Respondent 6: Small farms should only be using either a refrigeration heat recovery unit or a precooler for economic reasons. These are competing technologies.

13. What are your estimates of the use of inline well water pre-coolers on MEDIUM and LARGE scale dairy operations (100 milking cows or more) under the program scenarios and time periods listed below?

Respondent 1:

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	45	N/A
2012 (in four years)	50	60	75
2018 (in ten years)	50	65	80

Respondent 2:

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	65	80	85
2018 (in ten years)	70	90	95

Respondent 3:

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	35	N/A
2012 (in four years)	35	50	75
2018 (in ten years)	40	75	95

Respondent 4:

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55	N/A
2012 (in four years)	60	65	70
2018 (in ten years)	65	75	80

Respondent 5:

	Usage of Well Water Pre-Coolers (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	70	80	90
2018 (in ten years)	75	85	95

Respondent 6: Large farms should all have precoolers but finding storage and uses for used water can limit use. VSD will increase efficiency of precooler. Medium farm use will depend on milk production and hot water use. High hot water use will decrease the economics of using a precooler.

14. What are your estimates of the use of WASTE HEAT RECOVERY FROM REFRIGERATION FOR HOT WATER HEATING on SMALL scale dairy operations (100 milking cows or less) under the program scenarios and time periods listed below?

Respondent 1:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	50	60	80
2018 (in ten years)	50	65	85

Respondent 2:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	55	60	70
2018 (in ten years)	60	70	80

Respondent 3:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	30	50	75
2018 (in ten years)	30	75	95

Respondent 4:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	40	45
2018 (in ten years)	40	50	60

Respondent 5:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	75	N/A
2012 (in four years)	75	80	90
2018 (in ten years)	75	85	95

15. What are your estimates of the use of WASTE HEAT RECOVERY FROM REFRIGERATION FOR HOT WATER HEATING on MEDIUM and LARGE scale dairy operations (100 milking cows or more) under the program scenarios and time periods listed below?

Respondent 1:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	65	N/A
2012 (in four years)	65	75	90
2018 (in ten years)	65	80	90

Respondent 2:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	65	70	75
2018 (in ten years)	70	80	90

Respondent 3:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	30	50	75
2018 (in ten years)	30	75	95

Respondent 4:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	72	75	80
2018 (in ten years)	80	85	90

Respondent 5:

	Usage of Waste Heat Recovery from Refrigeration for Hot Water Heating (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	75	N/A
2012 (in four years)	75	80	90
2018 (in ten years)	75	85	95

Respondent 6: Every dairy farm regardless of size can justify a refrigeration heat recovery unit.

16. Regardless of the size of operation, what are your estimates of the use of SCROLL COMPRESSORS (in lieu of traditional reciprocating compressors) for milk refrigeration units under the program scenarios and time periods listed below?

Respondent 1:

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	50	60	75
2018 (in ten years)	50	65	80

Respondent 2:

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	45	N/A
2012 (in four years)	50	65	70
2018 (in ten years)	55	75	85

Respondent 3:

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	25	N/A
2012 (in four years)	25	35	50
2018 (in ten years)	35	50	75

Respondent 4:

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	40	40
2018 (in ten years)	40	50	55

Respondent 5:

	Usage of SCROLL COMPRESSORS (% share of dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	10	20
2018 (in ten years)	5	15	30

17. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	2	3	4	Expert 5
		x		

Respondent 2:

Novice 1	2	3	4	Expert 5
			X	

Respondent 3:

Novice 1	2	3	4	Expert 5
			X	

Respondent 4:

Novice 1	2	3	4	Expert 5
				x

Respondent 5:

Novice 1	2	3	4	Expert 5
				5

Respondent 6:

Novice 1	2	3	4	Expert 5
				xx

Dairy and Livestock Industry – Lighting

18. What are your estimates of the percentage of INTERIOR lighting on SMALL dairy operations that is supplied using high efficiency fluorescent lighting (such as CFLs) under the program scenarios and time periods listed below?

Respondent 1:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	40	N/A
2012 (in four years)	40	55	75
2018 (in ten years)	45	60	80

Respondent 2:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	30	N/A
2012 (in four years)	35	60	70
2018 (in ten years)	50	80	80

Respondent 3:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	15	25
2018 (in ten years)	10	20	50

Respondent 4:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	35	N/A
2012 (in four years)	40	45	50
2018 (in ten years)	50	65	80

Respondent 5:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	50	75	90
2018 (in ten years)	40	80	95

19. What are your estimates of the percentage of INTERIOR lighting on MEDIUM to LARGE scale dairy operations that is supplied using high efficiency fluorescent lighting (such as CFLs) under the program scenarios and time periods listed below?

Respondent 1:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	55	N/A
2012 (in four years)	55	65	80
2018 (in ten years)	55	70	90

Respondent 2:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	55	70	75
2018 (in ten years)	65	85	90

Respondent 3:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	15	N/A
2012 (in four years)	10	30	40
2018 (in ten years)	15	50	60

Respondent 4:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	65	70	75
2018 (in ten years)	70	80	90

Respondent 5:

	Percentage of high efficiency fluorescent INTERIOR lighting (% share of MEDIUM or LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	70	75	90
2018 (in ten years)	60	80	95

20. What are your estimates of the percentage of EXTERIOR lighting on SMALL scale dairy operations that is supplied using high efficiency lighting (such as high pressure sodium or CFLs) under the program scenarios and time periods listed below?

Respondent 1:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	45	N/A
2012 (in four years)	45	60	75
2018 (in ten years)	50	65	80

Respondent 2:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	15	20	30
2018 (in ten years)	20	30	50

Respondent 3:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	5	N/A
2012 (in four years)	5	10	15
2018 (in ten years)	10	15	20

Respondent 4:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	15	20	30
2018 (in ten years)	20	35	50

Respondent 5:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	50	75	90
2018 (in ten years)	50	80	95

Respondent 6:

	Percentage of high efficiency EXTERIOR lighting (% share of SMALL scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	5%	N/A
2012 (in four years)			
2018 (in ten years)			

21. What are your estimates of the percentage of EXTERIOR lighting on MEDIUM to LARGE scale dairy operations that is supplied using high efficiency lighting (such as high pressure sodium or CFLs) under the program scenarios and time periods listed below?

Respondent 1:

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	50	N/A
2012 (in four years)	50	70	80
2018 (in ten years)	50	70	85

Respondent 2:

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	15	20	30
2018 (in ten years)	20	30	50

Respondent 3:

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	15	20
2018 (in ten years)	15	20	25

Respondent 4:

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	20	N/A
2012 (in four years)	25	30	35
2018 (in ten years)	30	40	60

Respondent 5:

	Percentage of high efficiency EXTERIOR lighting (% share of MEDIUM and LARGE scale dairy operations using this technology)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	70	N/A
2012 (in four years)	70	75	90
2018 (in ten years)	70	80	95

Respondent 6: Few farms use HPS, most have mercury vapor for yard lights.

22. What are your estimates of the percentage of farms using a long day lighting schedule in animal housing structures? Consider long day lighting to consist of at least 16 hours of light followed by 8 hours of darkness.

Respondent 1:

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008	35	50	65
2012 (in four years)	40	60	75

Respondent 2:

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008	20	40	40
2012 (in four years)	30	50	60
2018 (in ten years)	50	70	90

Respondent 3:

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008	5	10	15
2012 (in four years)	10	15	20
2018 (in ten years)	10	15	20

Respondent 4:

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008	10	25	35
2012 (in four years)	20	35	45
2018 (in ten years)	30	50	70

Respondent 5:

	Percentage of farms using a long day lighting schedule in animal housing structures or barns?		
Year	**Small (<100 cows)**	**Medium (100-200 cows)**	**Large (>200 cows)**
2008	5	15	20
2012 (in four years)	5	15	25
2018 (in ten years)	5	15	30

Respondent 6: Many think they are doing LDL but few are doing it correctly. As farms go to 3 times per day milking which a majority of medium and large farms, it is often not practiced correctly so they likely are not getting the milk production increase.

23. On a scale of 1 to 5, how would you rate your level of expertise on this topic?

Respondent 1:

Novice 1	**2**	**3**	**4**	**Expert 5**
			x	

Respondent 2:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

Respondent 3:

Novice 1	**2**	**3**	**4**	**Expert 5**
			X	

Respondent 4:

Novice 1	2	3	4	Expert 5
				x

Respondent 5:

Novice 1	2	3	4	Expert 5
				5

Respondent 6:

Novice 1	2	3	4	Expert 5
				xx

Dairy Industry – Parting Shots (optional)

24. Thinking 'outside of the box', are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in the dairy industry?

Respondent 1: The use of Biogas and Biomass offer some good opportunities for renewable energy on dairies.

Respondent 2: Promoting through the milk haulers/vets/nutritionists. Establishing an Energy Star-like standard for carbon neutral/carbon negative farm operations.

Respondent 3: Yes – don't treat dairy like commercial or industrial – address unique aspects

Respondent 4: No.

Respondent 5: I believe producing heat and electricity with wood, grain, wind, solar, manure, etc, is not only renewable but should also be considered energy efficient and larger incentives should be offered to even small scale farms, hobby farms, etc.

Respondent 6: Utility costs (electric and gas) are typically less than 2% of the overall production cost on a dairy so there is less emphasis placed on investments in this area than on production of feed which can be 30% or more of the cost of producing milk.

25. Are there energy efficiency measures offering substantial opportunities for reducing dairy energy consumption that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?

Respondent 2: Clean-in-place sanitation systems, thermal storage systems, CHP systems.

Respondent 3: Yes, but they are few and savings are more difficult to quantify.

Respondent 4: No.

Respondent 5: Farms that use wood, corn, or pellet boilers to produce heat for their house, parlor, shop, etc. should have better incentives.

Respondent 6: Need program to actively promote replacement of mercury vapor yard lights with HPS. Need increase education on recycling of lamps containing mercury (everything except incandescent and halogen).

26. Are there future changes on the horizon that may present new energy challenges for dairy farmers in Wisconsin?

Respondent 2: Expanded automation as farms struggle to find enough farm help, further consolidation of smaller operations, on-farm processing.

Respondent 3: Yes.

Respondent 4: If trouble citing new dairies, large manure handling may present a challenge for the number of digestors.

Respondent 5: As energy prices continue to rise and commodity prices stay at levels were farmers are struggling to brake even is a huge challenge for Wisconsin Agriculture.

Respondent 6: As dairy farm size increases more will be milking 24/7. This may reduce AM (5-9 AM) and PM (4-7PM) peak use but will increase the peak load from 1 to 4 PM – the summer time peak demand period.

Grain Drying

27. Little data exists concerning the quantity and type of grain dryers currently owned and operated in Wisconsin. The following questions are designed to help estimate the quantitative and qualitative characteristics of the market for grain drying equipment in Wisconsin.
    a. In your opinion, what percentage of farms own grain drying equipment, with the remainder either drying grain in the field or transporting wet grain to a central grain handling facility?

Respondent 2:

Percent owning drying equipment	10
Percent drying at a central handling facility	80
Percent drying in the field/storage (no drying equip)	10
Total	100%

Respondent 3:

Percent owning drying equipment	50
Percent drying at a central handling facility	65
Percent drying in the field/storage (no drying equip)	0
Total	115%

Respondent 4:

Percent owning drying equipment	5
Percent drying at a central handling facility	20
Percent drying in the field/storage (no drying equip)	75
Total	100%

b. In your opinion, what percentage of grain dryers operating in Wisconsin could be described using the following 'flow' characteristics?

Respondent 3:

Continuous Flow – Column	50
Batch Feed – Bin	15
Automated Batch Feed – Bin	15
Continuous Flow – Bin	10
Other:	10
Total	100%

c. In your opinion, what percentage of grain dryers operating in Wisconsin could be described using the following 'temperature' characteristics?

Respondent 2:

High Temperature	70
Low or Ambient Temperature	10
Combination High/Low Temperature	20
Total	100%

Respondent 3:

High Temperature	75
Low or Ambient Temperature	20
Combination High/Low Temperature	5
Total	100%

d. In your opinion, what percentage of column dryers operating in Wisconsin are of the following type?

Respondent 3:

Cross Flow	95
Mixed Flow	5
Concurrent Flow	0
Counter Flow	0
Total	100%

e. In your opinion, what percentage of In-bin dryers operating in Wisconsin are of the following type?

Respondent 3:

Low Temperature In-Bin	25
High Temperature In-Bin	75
Total	100%

28. Please estimate the current and future market penetration rates for the following grain drying technologies, regardless of the size of operation.

Respondent 3:

	Market share (% of grain drying operations possessing this technology.)		
Technology	**2008**	**2012**	**2018**
Automated Controls	25	35	35
In-bin Cooling	10	10	10
Dryeration	10	10	10
Addition of a Stirring Mechanism	10	10	10
High Efficiency Ventilation Fans	10	10	10
Heat Recovery	10	10	10
Total	100%	100%	100%

29. Cross flow driers are currently the most widely used column-type grain drying system. Mixed and concurrent flow column-type systems are said to be more energy efficient but are not yet widely used in the US. What is your estimation for current and future market penetration rates for mixed and concurrent flow column type driers?

Respondent 3:

	Market share (% column type driers possessing this technology.)		
	2008	**2012**	**2018**
Cross Flow	45	35	25
Enhanced Cross Flow (Heat Recovery, Automated Controls, etc)	50	60	60
Mixed Flow	5	5	10
Concurrent Flow	0	0	
Counter Flow	0	0	
Total	100%	100%	100%

VSDs in Sectors Other than Dairy

30. What are your estimates for the market share of variable speed drive (VSDs) to power ventilation fans used in potato or other produce storage facilities under the program scenarios and time periods listed below?

Respondent 3:

	Market share (% of facilities using VSDs)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	10	N/A
2012 (in four years)	10	15	25
2018 (in ten years)	15	20	50

Respondent 4:

	Market share (% of facilities using VSDs)		
Year	**In the absence of state or utility programs**	**Under existing program approaches and funding**	**Under the most aggressive possible program approaches and funding**
2008 (current installed base)	N/A	60	N/A
2012 (in four years)	65	70	75
2018 (in ten years)	70	80	85

Sectors Other than Dairy– Parting Shots (optional)

31. Thinking ‘outside of the box’, are there innovative program strategies that offer new approaches for promoting energy efficiency improvement in Wisconsin’s agriculture sector?

Respondent 2: Develop industry standards for drying efficiency.

Respondent 3: Yes.

Respondent 4: No.

32. Are there energy efficiency measures offering substantial opportunities for reducing energy consumption within agriculture that are not currently addressed by Focus on Energy incentives or that remain otherwise unpublicized?

Respondent 2: Renewable-based drying options, biomass-fueled dryers, high density solar salt ponds.

Respondent 3: Yes.

Respondent 4: No.

33. Are there future changes on the horizon that may present new energy challenges for farmers in Wisconsin?

Respondent 2: New varieties of grains with different drying characteristics/needs. More grains being used for fuel production and more use of spent grains for animal feed.

Respondent 3: Yes.

Respondent 4: The input costs and regulations for each commodity.