memo

To: Natelle Dietrich, PSC; Brenda Wilbers, DNR
From: Tom Franks
Date: September 27, 2010
Copy: Fred Coito & Kristina Kelly, KEMA; Gwen Mizell, GSM Development
Subject: Interim Memo on Measure Data

This memorandum is intended to meet the following objectives:

1. To provide the Commission and stakeholders with a representative set of measures likely to be included in the analysis;
2. To inform the Commission and stakeholders on the relative magnitude of savings anticipated from each measure; and,
3. To create a brief window during which measures may be added to or removed, or their inputs adjusted, from the analysis with relative ease.

The measures in this document are derived from past analyses for other jurisdictions. In light of the global market place for equipment that has developed over the last several decades, the relative consistency of construction & installation methodologies across time and climate zones, and the relative homogeneity of behavioral norms across the United States, this representative set of measures will serve as a starting point for discussion.

The KEMA team has received a substantial quantity of information in response to data requests submitted to PSC and DNR staff. Missouri staff members have been most helpful and forthcoming. The KEMA team has examined this data and found that:

- The data are not in a consistent format – The inputs necessary for our analysis are presented by different utilities in different formats.
- The data are not presented with a consistent degree of detail – For example, while the total savings per measure may be presented in terms of kWh/year across several utilities, the underlying inputs are often not provided. Absent definition of all inputs, comparison and normalization of inputs is not fully possible.
- The data are scattered across a wide variety of documents and challenging to find – For example, when KEMA asked PSC staff to find documentation for the data presented in one utility-filed integrated resource plan, staff reported that they were unable to locate the data.

The KEMA team continues to examine the Missouri-provided data, and is looking for other sources of Missouri-specific scaling and/or evaluation of measure inputs. The issues enumerated above apply to the other data sets that feed into the analysis, and will be addressed in subsequent interim memos and the final data input reports.

Due to the limited time frame and the issues with the local data, we will prioritize our data update efforts that we expect to represent the largest share of savings potential, base on the findings of

studies done in other areas. Below we show, by sector and fuel, the measures that were top twenty measures by share of savings potential in some of our previous studies. Because the penetration of efficiency measures will vary between jurisdictions, the tables supplied are not a guarantee of what the top twenty measures will be for each sector and fuel in this study. The tables are given as a starting point to see which measures have historically had the most impact on savings potential in other jurisdictions. These will also serve as a guideline for KEMA as we will focus a majority of our efforts on updating the input data for these measures to be as Missouri centric as possible.

These tables rank the measures by their savings as a percent of total technical potential. The tables also indicate whether or not the measure passed the total resource cost (TRC) test.[1] In the residential sector, measures are shown by building type, but in the commercial and industrial sectors, the technical potential savings has been aggregated across all building types and the TRC is an average across the sector. Note that the percent of savings falls off sharply from the highest-saving measure to the lowest; across the sectors the 20th measure on the list saves between 0.55 and 1.4 percent of technical potential, compared to 7 to 22 percent of savings for the top measure.

Table of Figures

[1] For discussion of technical potential and TRC, please see KEMA's proposal, Section 5 and Appendix A.

Figure 1 – Residential Existing Electric Top 20 Measures from Past Studies

Measure Name	Building Type	Technical GWh as % of total Sector Technical	Pass TRC Test
CFL (15-Watt integral ballast), 1.8 hr/day	Single Family	18.09%	Yes
CFL (15-Watt integral ballast), 1.8 hr/day	Multi-family	9.83%	Yes
Heat Pump Dryer	Single Family	5.47%	No
Second Refrigerator Recycling	Single Family	3.90%	Yes
Conservation Practices	Single Family	3.81%	Yes
CFL (15-Watt integral ballast), 1.8 hr/day	Low Income	2.94%	Yes
Variable speed furnace fans (ROB)	Single Family	2.79%	Yes
Conservation Practices	Multi-family	1.80%	Yes
Variable speed furnace fans (RET)	Single Family	1.67%	Yes
LEDs w/ Incandescent Baseline	Single Family	1.64%	No
LEDs w/ CFL Baseline	Single Family	1.49%	Yes
Variable speed furnace fans (ROB)	Multi-family	1.21%	Yes
Second Refrigerator Recycling	Multi-family	1.17%	Yes
Energy Star Dehumidifier (ROB)	Single Family	1.07%	Yes
Single Pane Windows to Double Pane with Gas	Single Family	1.01%	Yes
High Efficiency CD (EF=3.01 w/moisture sensor)	Single Family	1.01%	No
LEDs w/ CFL Baseline	Multi-family	0.97%	Yes
Proper Refrigerant Charging and Air Flow	Single Family	0.94%	Yes
Heat Pump Dryer	Multi-family	0.92%	No
LEDs w/ Incandescent Baseline	Multi-family	0.89%	No
Total		**62.61%**	

Figure 2 – Commercial Existing Electric Top 20 Measures from Past Studies

Measure Name	Technical GWh as % of total Sector Technical	Pass TRC Test
CFL Screw-in 18W	7.78%	Yes
PC Network Power Management Enabling	4.51%	Yes
DX Packaged System, EER=13.4, 10 tons	4.42%	Yes
Variable Speed Drive Control, 5 HP	3.65%	Yes
CFL Hardwired, Modular 18W	3.14%	Yes
LED Outdoor Area Lighting	2.71%	Yes
High Pressure Sodium 250W Lamp	2.53%	Yes
LED Streetlighting	2.52%	Yes
Aerosol Duct Sealing - DX	2.29%	No
Outdoor Lighting Controls (Photocell/Timeclock)	2.05%	Yes
Fiber Optic Display Lighting	2.04%	Yes
Demand Controlled Ventilation	2.02%	Yes
ROB 2L4' Premium T8, 1EB	1.87%	Yes
High-efficiency fan motors	1.84%	Yes
Prog. Thermostat - DX	1.75%	Yes
Demand Defrost Electric	1.72%	Yes
LED Indoor Lighting - Base 2L4'T8	1.68%	No
High Bay T5 - Base Std MH	1.68%	Yes
High Performance Lighting Remod/Renov - 25% Savings - Base 2L4'T8	1.47%	Yes
Energy Star or Better PC	1.38%	Yes
Total	**53.05%**	

Figure 3 – Industrial Existing Electric Top 20 Measures from Past Studies

Measure Name	Technical GWh as % of total Sector Technical	Pass TRC Test
Metal Halide, 50W	7.84%	No
Extruders/injection Moulding-multipump	7.75%	Yes
RET 2L4' Premium T8, 1EB	6.23%	Yes
Pumps - System Optimization	6.02%	Yes
Fans - Controls	5.73%	Yes
Pumps - Controls	3.93%	Yes
Centrifugal Chiller, 0.51 kW/ton, 500 tons	3.82%	Yes
Direct drive Extruders	3.66%	Yes
Compressed Air - System Optimization	3.27%	Yes
Fans - System Optimization	3.22%	Yes
Pumps - Sizing	2.97%	Yes
Pumps - O&M	1.96%	Yes
O&M - Extruders/Injection Moulding	1.94%	Yes
Injection Moulding - Impulse Cooling	1.86%	Yes
DX Packaged System, EER=10.9, 10 tons	1.79%	Yes
Injection Moulding - Direct drive	1.79%	Yes
EMS - Chiller	1.73%	Yes
Pumps - ASD (100+ hp)	1.66%	Yes
Compressed Air-O&M	1.61%	Yes
Optimization Refrigeration	1.21%	Yes
Total	**70.00%**	

Figure 4 – Residential Existing Gas Top 20 Measures from Past Studies

Measure Name	Technical as % of total Sector Technical	Pass TRC Test
Solar Water Heater	17.00%	No
HE Water Heater (EF=0.71)	16.33%	Yes
Condensing Furnace - 94 AFUE (Tier 2)	10.20%	Yes
Wall 2x4 R-0 to Blow-In R-13 Insulation	7.56%	Yes
Furnace Diagnostic Testing, Repair and Maintenance	3.56%	Yes
High Efficiency Condensing Boiler (AFUE = 90%)	3.45%	Yes
Windows - Add Storm Windows to Double-Glazed	3.37%	No
Basement insulation R-13 (Furnace)	3.28%	Yes
Crawlspace insulation	2.81%	Yes
Convection Oven	2.35%	Yes
Windows - Double-Glazed to Energy Star	2.27%	Yes
Boiler controls	2.12%	Yes
Comprehensive Shell Air Sealing - Inf. Reduction	2.09%	Yes
Low-Flow Showerheads	1.75%	Yes
Plastic Film (1-2 yr measure, window kit)	1.53%	No
Drain Water Heat Recovery (GFX)	1.51%	Yes
Self Install Weatherization	1.37%	Yes
Wall 2x4 R-0 to Blow-In R-13 Insulation	1.35%	Yes
Windows - Add Storm Windows to Single-Glazed	1.19%	No
High efficiency gas room heater	1.18%	Yes
Total	86.26%	

Figure 5 - Commercial Existing Gas Top 20 Measures from Past Studies

Measure Name	Technical as % of total Sector Technical	Pass TRC Test
High Efficiency (Power Burner/ Premium) Boiler	22.43%	Yes
Demand controlled ventilation (DCV)	14.65%	Yes
Insulation (wall)	9.92%	Yes
Installation of Energy Management Systems (EMS)	8.61%	Yes
Water Heater Tank Blanket/Insulation	5.50%	Yes
Clock / Programmable Thermostat	4.34%	Yes
Tankless Water Heater	4.06%	Yes
Condensing Water Heater	4.01%	Yes
Insulation (ceiling)	3.70%	Yes
High Efficiency (Power Burner/ Premium) Furnace	3.03%	No
High Efficiency Windows	2.49%	Yes
Energy Star Fryer	2.26%	Yes
Energy Star Steamer	2.25%	Yes
Stack Heat Exchanger	2.12%	Yes
EMS Optimization	2.07%	Yes
Thermally activated heat pump/chiller	2.00%	Yes
Installation of Air Side Heat Recovery Systems	0.91%	No
High-Efficiency Range	0.80%	No
Demand controlled circulating systems	0.74%	Yes
Heat Recovery from AC	0.55%	No
Total	96.44%	

Figure 6 - Industrial Existing Gas Top 20 Measures from Past Studies

Measure Name	Technical as % of total Sector Technical	Pass TRC Test
Improved insulation	12.46%	Yes
Heat Recovery	10.34%	Yes
Process Controls & Management	9.58%	Yes
Steam trap maintenance	8.68%	Yes
Efficient burners	7.72%	Yes
Load control	6.78%	Yes
Improve ceiling insulation	5.68%	Yes
Install high efficiency (95%) condensing furnace/boiler	4.33%	Yes
Automatic steam trap monitoring	3.99%	Yes
Process integration	3.68%	Yes
Maintain boilers	3.46%	Yes
Improved process control	2.88%	Yes
Efficient drying	2.44%	Yes
EMS install	2.25%	No
Thermally activated heat pump/chiller	2.10%	Yes
Combustion controls	2.04%	Yes
Oxyfuel	1.79%	Yes
Optimize furnace operations	1.68%	Yes
Water treatment	1.43%	Yes
Flue gas heat recovery/economizer	1.40%	Yes
Total	94.72%	

Figure 7 –Measures List for Commercial Existing Electricity from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Health Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Fluorescent Fixture, 4L4'T12, 34W, 2EEMAG	fixture	$27.00	$23.32										
RET 4L4' Premium T8, 1EB, base 4L4'T12	fixture	$35.00	$23.32	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
RET 2L4' Premium T8, 1EB, Reflector, base 4L4'T12	fixture	$46.74	$22.09	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%
LED Indoor Lighting - Base 4L4'T12	fixture	$180.00	$23.32	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
Occupancy Sensor, 4L4' Fluorescent Fixtures - Base 4L4'T12	sq ft	$0.14		30.0%	20.0%	20.0%	20.0%	30.0%	30.0%	20.0%	20.0%	20.0%	20.0%
Continuous Dimming, 5L4' Fluorescent Fixtures - Base 4L4'T12	sq ft	$0.75		52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Lighting Control Tuneup	sqft		$0.01	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
High Performance Lighting Remod/Renov - 25% Savings - Base 4L4'T12	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Base Fluorescent Fixture, 2L4'T12, 34W, 1EEMAG	fixture	$16.19	$23.32										
RET 2L4' Premium T8, 1EB -- base 2L4'T12	fixture	$25.74	$23.32	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
RET 1L4' Premium T8, 1EB, Reflector OEM - Base 2L4'T12	fixture	$44.09	$22.09	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%
LED Indoor Lighting - Base 2L4'T12	fixture	$90.00	$23.32	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
Occupancy Sensor, 8L4' Fluorescent Fixtures - Base 2L4'T12	sq ft	$0.14		30.0%	20.0%	20.0%	20.0%	30.0%	30.0%	20.0%	20.0%	20.0%	20.0%
Continuous Dimming, 10L4' Fluorescent Fixtures - Base 2L4'T12	sq ft	$0.75		52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Lighting Control Tuneup - Base 2L4'T12	sqft		$0.01	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
High Performance Lighting Remod/Renov - 25% Savings - Base 2L4'T12	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Base Fluorescent Fixture, 2L8'T12, 60W, 1EEMAG	fixture	$36.00	$17.00										
RET 2 - 2L4' Premium T8, 1EB - Base 2L8'T12	fixture	$51.48	$46.64	12.9%	12.9%	12.9%	12.9%	12.9%	12.9%	12.9%	12.9%	12.9%	12.9%
RET 2 - 1L4' Premium T8, 1EB, Reflector OEM - Base 2L8'T12	fixture	$88.18	$44.18	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%
LED Indoor Lighting - Base 2L8'T12	fixture	$180.00	$46.64	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
Occupancy Sensor, 4L8' Fluorescent Fixtures - Base 2L8'T12	sq ft	$0.14		30.0%	20.0%	20.0%	20.0%	30.0%	30.0%	20.0%	20.0%	20.0%	20.0%
Continuous Dimming, 5L8' Fluorescent Fixtures - Base 2L8'T12	sq ft	$0.75		52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%	52.0%
High Performance Lighting Remod/Renov - 25% Savings - Base 2L8'T12	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Base Incandescent Flood, 75W to Screw-in Replacement	fixture	$0.68	$4.91										
CFL Screw-in 18W	fixture	$7.97	$4.91	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%
Cold Cathode Lamps	fixture	$22.00	$4.91	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%
Screw-in LED--Base Incandescent	fixture	$75.00	$4.91	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Base CFL to screw-in replacement	fixture	$7.97	$4.91										
Screw-in LED--Base CFL	fixture	$75.00	$4.91	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Base Incandescent Flood, 75W to Hardwired CFL	fixture	$0.61	$3.77										
CFL Hardwired, Modular 18W	fixture	$19.00	$27.00	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%
Ceramic Metal Halide	fixture	$90.00	$27.00	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Hardwired LED fixture--Base Incandescent	fixture	$94.61	$30.77	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Base CFL to Hardwired replacement	fixture	$19.61	$30.77										
Hardwired LED fixture--Base CFL	fixture	$94.61	$30.77	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Base High Bay Probe-start Metal Halide, 400W	fixture	$200.00	$60.00										
High Bay T5 - Base Std MH	fixture	$290.00	$60.00	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%
PSMH + electronic ballast	fixture	$413.60	$60.00	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Induction High Bay Lighting - Base Std MH	fixture	$480.00	$60.00	37.4%	37.4%	37.4%	37.4%	37.4%	37.4%	37.4%	37.4%	37.4%	37.4%
Occupancy Sensor, High Bay T5 - Base Std MH	sq ft	$0.14		20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
High Performance Lighting Remod/Renov - 25% Savings - Base High Bay PSMH	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Base 4L4'T8, 1EB	fixture	$0.00	$0.00										
ROB 4L4' Premium T8, 1EB - Base 4L4'T8	fixture	$7.00	$0.00	15.8%	15.8%	15.8%	15.8%	15.8%	15.8%	15.8%	15.8%	15.8%	15.8%
Occupancy Sensor, 4L4' Fluorescent Fixtures - Base 4L4'T8	sq ft	$0.14		30.0%	20.0%	20.0%	20.0%	30.0%	30.0%	20.0%	20.0%	20.0%	20.0%
Lighting Control Tuneup - Base 4L4'T8	sqft		$0.01	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LED Indoor Lighting - Base 4L4'T8	fixture	$180.00	$23.32	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%
High Performance Lighting Remod/Renov - 25% Savings - Base 4L4'T8	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Base 2L4'T8, 1EB	fixture	$0.00	$0.00										
ROB 2L4' Premium T8, 1EB - Base 2L4'T8	fixture	$5.00	$0.00	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%
Occupancy Sensor, 8L4' Fluorescent Fixtures - Base 2L4'T8	sq ft	$0.14		30.0%	20.0%	20.0%	20.0%	30.0%	30.0%	20.0%	20.0%	20.0%	20.0%
Lighting Control Tuneup - Base 2L4'T8	sqft		$0.01	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LED Indoor Lighting - Base 2L4'T8	fixture	$90.00	$23.32	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%
High Performance Lighting Remod/Renov - 25% Savings - Base 2L4'T8	sqft	$0.20		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%

Figure 8 - Measures List for Commercial Existing Electricity from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Health Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Exit Sign	fixture	$0.00											
LED Exit Sign	fixture	$50.00		80.8%	80.8%	80.8%	80.8%	80.8%	80.8%	80.8%	80.8%	80.8%	80.8%
Base Outdoor Mercury Vapor 400W Lamp	fixture												
High Pressure Sodium 250W Lamp	fixture	$89.00	$60.00	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
LED Outdoor Area Lighting	fixture	$400.00	$57.00	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%
LED Outdoor Bi-level Fixtures	fixture	$1,300.00	$57.00	69.6%	69.6%	69.6%	69.6%	69.6%	69.6%	69.6%	69.6%	69.6%	69.6%
Outdoor Lighting Controls (Photocell/Timeclock)	fixture	$51.00	$57.00	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%
Base Street Lighting	fixture	$118.00	$150.00										
Induction Streetlighting	fixture	$400.00	$150.00	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
LED Streetlighting	fixture	$400.00	$150.00	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%	51.9%
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	ton	$220.00											
Centrifugal Chiller, 0.51 kW/ton, 500 tons	ton	$255.00		12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%
Window Film (Standard)	sf-window	$2.06	$0.64	9.3%	10.3%	2.5%	2.5%	9.3%	3.9%	2.5%	1.2%	7.0%	2.5%
EMS - Chiller	ton	$60.00		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Cool Roof - Chiller	sf-roof	$0.35		3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
Chiller Tune Up/Diagnostics	sqft			8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
VSD for Chiller Pumps and Towers	ton	$32.00	$10.00	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
EMS Optimization	sqft	$0.00		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Economizer - Chiller	ton	$126.76	$43.34	27.0%	0.0%	21.0%	21.0%	27.0%	12.0%	21.0%	18.0%	43.0%	0.0%
Duct/Pipe Insulation - Chiller	sqft-insulation	$3.08		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
High Efficiency Chiller Motors	ton	$19.49		3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Base DX Packaged System, EER=10.3, 10 tons	ton	$460.83	$308.85										
DX Tune Up/ Advanced Diagnostics	sqft			5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
DX Packaged System, EER=10.9, 10 tons	ton	$487.48	$308.85	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
DX Packaged System, EER=11.5, 10 tons	ton	$567.50	$308.85	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
DX Packaged System, EER=13.4, 10 tons	ton	$1,500.00	$308.85	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%
Ductless (Mini Split) Cooling System													
Window Film (Standard)	sf-window	$2.06	$0.64	9.3%	10.3%	2.5%	2.5%	9.3%	3.9%	2.5%	1.2%	7.0%	2.5%
Prog. Thermostat - DX	ton	$5.50	$15.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Cool Roof - DX	sf-roof	$0.35		1.8%	6.9%	13.0%	13.0%	1.8%	6.1%	13.0%	0.6%	0.4%	13.0%
Optimize Controls	sqft			5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Economizer	ton	$126.76	$43.34	21.0%	8.0%	17.0%	1.0%	0.0%	10.0%	10.0%	1.0%	8.0%	8.0%
Aerosol Duct Sealing - DX	ton	$16.67	$91.24	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Ceiling/roof Insulation - DX	sf-ceiling	$0.38	$0.24	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%
Duct/Pipe Insulation - DX	sqft	$0.68	$2.40	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
DX Coil Cleaning	ton	$8.77		4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Base Fan Motor, 5hp, 1800rpm, 87.5%	HP	$52.00											
Fan Motor, 5hp, 1800rpm, 89.5%	HP	$72.00		2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Variable Speed Drive Control, 5 HP	HP	$214.00	$171.00	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Demand Controlled Ventilation	sqft	$0.48		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Base Fan Motor, 15hp, 1800rpm, 91.0%	HP	$43.00											
Fan Motor, 15hp, 1800rpm, 92.4%	HP	$54.00		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Variable Speed Drive Control, 15 HP	HP	$129.00	$102.00	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Air Handler Optimization, 15 HP	sqft	$0.00		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Energy Recovery Ventilation	ton	$130.95		7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Electronically Commutated Motors (ECM) on an air handler unit	ton	$27.76		14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%
Separate Makeup Air/Exhaust Hoods AC	HP	$3.00		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Demand Controlled Ventilation	sqft	$0.48		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Base Fan Motor, 40hp, 1800rpm, 93.0%	HP	$37.00											
Fan Motor, 40hp, 1800rpm, 94.1%	HP	$47.00		1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Variable Speed Drive Control, 40 HP	HP	$120.00	$37.00	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Air Handler Optimization, 40 HP	sqft	$0.00		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Demand Controlled Ventilation	sqft	$0.48		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Base Non-Commercial Refrigerator	refrigerator	$1,052.00	$0.00										
Energy Star Refrigerator	refrigerator	$1,131.00	$0.00	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
HE Refrigerator - CEE Tier 2 (side by side freezer)	refrigerator	$1,231.00	$0.00	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%

Figure 9 - Measures List for Commercial Existing Electricity from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Health Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Refrigeration System	40,000 sqft store	$0.00	$0.00										
High-efficiency fan motors	40,000 sqft store	$46,429.20	$0.00	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Strip curtains for walk-ins	40,000 sqft store	$1,995.00	$0.00	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Night covers for display cases	linear ft. display	$9.25	$0.00	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Evaporator fan controller for MT walk-ins	controller	$300.00	$0.00	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Efficient compressor motor	40,000 sqft store	$3,510.00	$0.00	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
Compressor VSD retrofit	40,000 sqft store	$16,200.00	$0.00	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%
Floating head pressure controls	40,000 sqft store	$4,995.00	$0.00	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
Refrigeration Commissioning	Ton of Load	$113.00	$0.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Demand Hot Gas Defrost	HP	$25.00	$0.00	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Demand Defrost Electric	HP	$25.00	$0.00	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%
Anti-sweat (humidistat) controls	40,000 sqft store	$6,450.40	$0.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Ice-makers (CEC Tier II = 5 kWh/100 lbs ice)	ice maker	$31.00	$0.00	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Freezer-Cooler Replacement Gaskets	lin ft doors	$5.00	$0.00	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%
High R-Value Glass Doors	lin ft glass doors	$100.28	$0.00	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Multiplex Compressor System	tons	$1,750.00	$0.00	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%
Oversized Air-Cooled Condenser	tons	$350.00	$0.00	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%
LED Display Lighting	lin ft glass doors	$100.00	$0.00	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Fiber Optic Display Lighting	lin ft glass doors	$114.08	$0.00	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%
Beverage Merchandisers	merchandiser	$166.00	$0.00	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Reach-In Refrigerators	merchandiser	$60.00	$0.00	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Reach-In Freezers	merchandiser	$250.00	$0.00	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
Walk-Ins	walk-in		$0.00										
Base Desktop PC	PC	$0.00	$0.00										
Energy Star or Better PC	PC	$1.00	$0.00	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%
PC Manual Power Management Enabling	PC	$0.00	$7.50	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%
PC Network Power Management Enabling	PC	$0.00	$7.50	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%
Base Monitor, CRT	PC	$0.00	$0.00										
Energy Star or Better Monitor - CRT	PC	$1.00	$0.00	56.1%	56.1%	56.1%	56.1%	56.1%	56.1%	56.1%	56.1%	56.1%	56.1%
Monitor Power Management Enabling - CRT	PC	$0.00	$7.50	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%
Base Monitor, LCD	Monitor	$0.00	$0.00										
Energy Star or Better Monitor - LCD	Monitor	$1.00	$0.00	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Monitor Power Management Enabling - LCD	Monitor	$0.00	$7.50	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%
Base Copier	Copier	$0.00	$0.00										
Energy Star or Better Copier	Copier	$1.00	$0.00	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%
Copier Power Management Enabling	Copier	$0.00	$45.00	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%
Base Laser Printer	Printer	$0.00	$0.00										
Printer Power Management Enabling	Printer	$0.00	$45.00	49.2%	49.2%	49.2%	49.2%	49.2%	49.2%	49.2%	49.2%	49.2%	49.2%
Base Data Center/Server Room	data center sqft												
Data Center Improved Operations	data center sqft	$0.10		20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Data Center Best Practices	data center sqft	$0.50		45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Data Center State of the Art practices	data center sqft	$1.00		56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Base Water Heating	kBtu/hr	$0.00	$0.00										
Demand controlled circulating systems	unit	$59.00	$165.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
High Efficiency Water Heater (electric)	kBtu/hr	$1.31	$0.00	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Heat Pump Water Heater (air source)	kBtu/hr	$30.22	$0.00	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Hot Water Pipe Insulation	Lin Ft Pipe	$0.37	$2.44	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Faucet Aerators													
Heat Recovery Unit	sqft	$0.08	$0.00	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Heat Trap	kBtu/hr	$0.36	$2.00	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Tankless Water Heater	kBtu/hr	$6.73	$4.54	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Solar Water Heater	kBtu/hr	$94.50	$0.00	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Pre-rinse spray valves													
Base Vending Machines	machine	$0.00	$0.00										
Vending Misers (cooled machines only)	machine	$179.00	$35.50	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Base Cooking		$0.00	$0.00										
Convection Oven	single oven	$750.00	$0.00	3.8%	2.2%	2.4%	3.3%	0.0%	4.0%	0.0%	3.7%	0.9%	4.1%
Efficient Fryer	unit	$1,344.00	$0.00	2.8%	2.6%	0.0%	2.4%	0.0%	0.3%	0.0%	1.5%	1.0%	2.8%
Efficient Steamer	unit	$2,490.00	$0.00	4.4%	7.0%	4.1%	4.2%	0.0%	5.5%	0.0%	6.9%	10.5%	7.2%
Energy Star Hot Food Holding Cabinets	cu ft	$1,713.00	$0.00	3.4%	12.9%	17.9%	9.6%	0.0%	20.5%	0.0%	17.5%	19.0%	0.0%

Figure 10 - Measures List for Commercial New Electricity from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Health Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Bldg Design - 30%	sqft	$0.00											
High Performance Building/Int Design - Tier 1 30%	sqft	$0.50		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Base Bldg Design - 50%	sqft	$0.00											
High Performance Building/Int Design - Tier 2 50%	sqft	$1.00		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Base Bldg Design - 70%	sqft	$0.00											
Near Zero Energy (60-75%)	sqft	$3.00		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%

Figure 11- Measures List for Commercial Existing Gas from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Cooking - Fryer	$/unit	$ -	$0.00										
Energy Star Fryer	$/unit	$ 1,400.00	$ -	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%
Base Cooking - Steamer	$/unit	$ -	$0.00										
Energy Star Steamer	$/unit	$ 2,075.00	$ -	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%
Base Cooking - Convection Oven	$/unit	$ -	$0.00										
High-Efficiency Convection Oven	$/unit	$ 1,571.00	$ -	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Base Cooking - Griddle	$/unit	$ -	$0.00										
High-Efficiency Griddle	$/unit	$ 1,165.00	$ -	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%
Base Cooking - Range	$/unit	$ -	$0.00										
High-Efficiency Range	$/unit	$ 2,493.00	$ -	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%
Base Heating	$/kBtuhr	$ -	$0.00										
High Efficiency Windows (Multiple Glazed, Low Emissivity)	$/sf-window	$ 6.99	$ -	18.4%	1.4%	5.1%	3.2%	0.0%	1.0%	0.0%	1.5%	3.0%	3.2%
Insulation (ceiling)	$/sf-ceiling	$ 0.38	$ 0.24	33.1%	40.0%	23.4%	20.1%	23.4%	15.7%	15.7%	6.0%	25.3%	23.4%
Insulation (wall)	$/sf-wall	$ 3.50		41.5%	32.5%	28.6%	37.6%	28.6%	18.0%	18.0%	35.0%	6.7%	28.6%
Duct Repair and Sealing	$/sf building	$ 0.16	$ -	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	2.0%	2.0%	0.0%	0.0%
Duct Insulation	$/sf insulation	$ 0.68	$ 2.40	1.8%	0.0%	2.4%	0.0%	0.0%	0.0%	3.9%	1.9%	2.2%	1.8%
Insulation of Pipes	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
Boiler Tune-Up	$/boiler	$ -	$ 300.00	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Clock / Programmable Thermostat	$/sqft	$ 0.05	$ 0.06	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	0.0%	6.0%	6.0%
Installation of Energy Management Systems (EMS)	$/control point	$ 750.00	$ -	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
EMS Optimization	$/sqft	$ -	$ 0.03	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Heat Recovery from AC	$/CFM	$ 2.30	$ -	20.0%	63.0%	0.0%	84.0%	0.0%	20.0%	20.0%	20.0%	20.0%	10.0%
Installation of Air Side Heat Recovery Systems	$/O-A CFM	$ 1.00	$ -	15.0%	25.0%	5.0%	15.0%	0.0%	15.0%	9.0%	25.0%	5.0%	10.0%
High Efficiency (Power Burner/ Premium) Furnace 95% efficiency (in situ base=82%)	$/kBtuhr	$ 14.00	$ -	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
High Efficiency (Power Burner/ Premium) Boiler 95% efficiency (in situ base=82%)	$/kBtuhr	$ 14.00	$ -	27.0%	27.0%	27.0%	27.0%	27.0%	27.0%	27.0%	27.0%	27.0%	27.0%
Stack Heat Exchanger	$/kBtuH boiler capacity	$ 1.00	$ -	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.7%	4.7%	4.6%	5.0%
Condensing unit heaters	$/unit	$ 1,325.00	$ -	0.0%	0.0%	0.0%	0.0%	21.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Radiant heater	$/unit	$ 1,938.00	$ -	0.0%	0.0%	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hot water temperature reset	$/unit	$ 300.00	$ -	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Demand controlled ventilation (DCV)	$/zone	$ 1,200.00	$ -	2.0%	17.6%	15.0%	37.0%	21.0%	32.0%	25.6%	0.0%	12.0%	12.0%
Refrigeration heat recovery - space conditioning	$/bldg	$ -	$ 40,000.00	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retrocommissioning	$/sqft	$ -	$ 0.06	6.0%	0.0%	4.0%	4.0%	2.0%	6.0%	6.0%	10.0%	6.0%	6.0%
Base Miscellaneous	$/unit	$ -	$0.00										
Base Water Heating - high standby loss (as % of load)	$/kBtuhr	$ -	$0.00										
Hot Water Pipe Insulation	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Water Heater Tank Blanket/Insulation	$/tank	$ 28.92	$ 45.29	19.2%	2.0%	16.0%	15.3%	19.2%	8.3%	2.0%	6.6%	2.0%	18.6%
Demand controlled circulating systems	$/unit	$ 59.00	$ 165.00	5.7%	1.9%	1.1%	0.7%	4.5%	5.0%	6.5%	5.6%	3.0%	3.8%
Tankless Water Heater	$/unit	$ 950.00	$ -	51.4%	0.0%	41.0%	42.7%	50.1%	28.3%	0.0%	25.6%	18.6%	39.9%
Thermally activated heat pump/chiller	$/kBtuhr	$ 5.10	$ 4.05	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%
Base Water Heating - low standby loss (as % of load)	$/kBtuhr	$ -	$0.00										
Hot Water Pipe Insulation	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Water Heater Tank Blanket/Insulation	$/tank	$ 28.92	$ 45.29	1.6%	1.2%	1.3%	1.1%	4.4%	0.5%	0.3%	0.1%	0.1%	4.9%
Demand controlled circulating systems	$/unit	$ 59.00	$ 165.28	5.7%	1.9%	1.1%	0.7%	4.5%	5.0%	6.5%	5.6%	3.0%	3.8%
Condensing Water Heater (gas, 95% thermal efficiency)	$/unit	$ 1,000.00	$ -	25.9%	26.8%	25.7%	25.5%	27.2%	25.7%	25.3%	25.2%	25.2%	27.5%
Thermally activated heat pump/chiller	$/kBtuhr	$ 5.10	$ 4.05	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%
Pre-Rinse Spray Valve	$/unit	$ 10.00	$ -	0.0%	3.7%	0.0%	3.0%	2.1%	1.1%	3.9%	1.3%	0.4%	1.0%

Figure 12 - Measures List for Commercial New Gas from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Office Measure Savings	Restaurant Measure Savings	Retail Measure Savings	Grocery Measure Savings	Warehousing Measure Savings	School Measure Savings	College Measure Savings	Care Measure Savings	Hotel Measure Savings	Miscellaneous Measure Savings
Base Cooking - Fryer	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Energy Star Fryer	$/unit	$ 1,400.00	$ -	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%
Base Cooking - Steamer	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Energy Star Steamer	$/unit	$ 2,075.00	$ -	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%	81.0%
Base Cooking - Convection Oven	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High-Efficiency Convection Oven	$/unit	$ 1,571.00	$ -	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Base Cooking - Griddle	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High-Efficiency Griddle	$/unit	$ 1,165.00	$ -	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%
Base Cooking - Range	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High-Efficiency Range	$/unit	$ 2,493.00	$ -	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%
Base Heating	$/kBtuhr	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Efficiency Windows (Multiple Glazed, Low Emissivity)	$/sf-window	$ 6.99	$ -	18.4%	1.4%	5.1%	3.2%	0.0%	1.0%	0.0%	1.5%	3.0%	3.2%
Insulation (ceiling)	$/sf-ceiling	$ 0.70	$ 0.16	5.3%	6.4%	8.0%	5.0%	15.0%	5.0%	3.0%	3.0%	3.0%	9.5%
Insulation (wall)	$/sf-wall	$ 0.90	$ 0.27	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Duct Repair and Sealing	$/sf building	$ 0.16	$ -	1.0%	1.0%	1.0%	0.5%	0.5%	0.5%	1.0%	1.0%	0.0%	0.0%
Duct Insulation	$/sf insulation	$ 0.68	$ 2.40	1.8%	0.0%	2.4%	0.0%	0.0%	0.0%	3.9%	1.9%	2.2%	1.8%
Insulation of Pipes	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
Boiler Tune-Up	$/boiler	$ -	$ 300.00	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Installation of Energy Management Systems (EMS)	$/control point	$ 750.00	$ -	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
EMS Optimization	$/sqft	$ -	$ 0.03	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Heat Recovery from AC	$/O-A CFM	$ 2.00	$ -	20.0%	63.0%	0.0%	84.0%	0.0%	20.0%	20.0%	20.0%	20.0%	10.0%
Installation of Air Side Heat Recovery Systems	$/CFM	$ 0.85	$ 0.15	15.0%	25.0%	5.0%	15.0%	0.0%	15.0%	9.0%	25.0%	5.0%	10.0%
High Efficiency (Power Burner/ Premium) Furnace/Boiler 95% efficiency (in situ base=82%)	$/kBtuhr	$ 12.00	$ -	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%
Stack Heat Exchanger	$/kBtuH boiler capacity	$ 1.00	$ -	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.7%	4.7%	4.6%	5.0%
Condensing unit heaters	$/unit	$ 1,325.00	$ -	0.0%	0.0%	0.0%	0.0%	21.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Radiant heater	$/unit	$ 1,938.00	$ -	0.0%	0.0%	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hot water temperature reset	$/unit	$ 300.00	$ -	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Demand controlled ventilation (DCV)	$/zone	$ 750.00	$ -	1.6%	17.6%	12.0%	29.6%	16.8%	25.6%	25.6%	0.0%	9.6%	9.6%
Refrigeration heat recovery - space conditioning	$/bldg	$ -	$ 40,000.00	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Miscellaneous	$/unit	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Base Water Heating - high standby loss (as % of load)	$/kBtuhr	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hot Water Pipe Insulation	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Water Heater Tank Blanket/Insulation	$/tank	$ 28.92	$ 45.29	6.0%	2.5%	6.0%	4.0%	7.5%	4.0%	2.5%	2.5%	1.0%	5.0%
Tankless Water Heater	$/unit	$ 1,450.00	$ -	51.4%	0.0%	41.0%	42.7%	50.1%	28.3%	0.0%	25.6%	18.6%	39.9%
Thermally activated heat pump/chiller	$/kBtuhr	$ 5.10	$ 4.05	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%
Base Water Heating - low standby loss (as % of load)	$/kBtuhr	$ -	$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hot Water Pipe Insulation	$/Lin Ft Pipe	$ 0.37	$ 2.44	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Water Heater Tank Blanket/Insulation	$/tank	$ 28.92	$ 45.29	6.0%	2.5%	6.0%	4.0%	7.5%	4.0%	2.5%	2.5%	1.0%	5.0%
Condensing Water Heater (gas, 95% thermal efficiency)	$/unit	$ 1,000.00	$ -	25.9%	26.8%	25.7%	25.5%	27.2%	25.7%	25.3%	25.2%	25.2%	27.5%
Thermally activated heat pump/chiller	$/kBtuhr	$ 5.10	$ 4.05	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%

Figure 13 - Measures List for Industrial Existing Electricity from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Food Measure Savings	Textiles,Apparel Measure Savings	Lumber,Furniture Measure Savings	Paper Measure Savings	Printing Measure Savings	Chemicals Measure Savings	Petroleum Measure Savings	Rubber,Plastics Measure Savings	Stone,Clay,Glass Measure Savings	Prim Metals Measure Savings	Fab Metals Measure Savings	Ind Mach Measure Savings	Electronics Measure Savings	Transp Equip Measure Savings	Misc. Measure Savings
Base Compressed Air	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Compressed Air-O&M	$/kWh	$0.01	$0.00	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%
Compressed Air - Controls	$/kWh	$0.02	$0.00	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Compressed Air - System Optimization	$/kWh	$0.01	$0.00	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Compressed Air- Sizing	$/kWh	$0.00	$0.00	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Comp Air - Replace 1-5 HP motor	$/kWh	$0.05	$0.01	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Comp Air - ASD (1-5 hp)	$/kWh	$0.07	$0.01	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Comp Air - Motor practices-1 (1-5 HP)	$/kWh	$0.02	$0.00	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Comp Air - Replace 6-100 HP motor	$/kWh	$0.03	$0.00	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Comp Air - ASD (6-100 hp)	$/kWh	$0.00	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Comp Air - Motor practices-1 (6-100 HP)	$/kWh	$0.00	$0.00	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Comp Air - Replace 100+ HP motor	$/kWh	$0.01	$0.00	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
Comp Air - ASD (100+ hp)	$/kWh	$0.01	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Comp Air - Motor practices-1 (100+ HP)	$/kWh	$0.00	$0.00	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Power recovery	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Fans	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fans - O&M	$/kWh	$0.00	$0.00	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Fans - Controls	$/kWh	$0.084	$0.01	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Fans - System Optimization	$/kWh	$0.055	$0.01	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%	21.2%
Fans- Improve components	$/kWh	$0.005	$0.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Fans - Replace 1-5 HP motor	$/kWh	$0.048	$0.01	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Fans - ASD (1-5 hp)	$/kWh	$0.07	$0.01	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Fans - Motor practices-1 (1-5 HP)	$/kWh	$0.02	$0.00	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Fans - Replace 6-100 HP motor	$/kWh	$0.03	$0.00	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Fans - ASD (6-100 hp)	$/kWh	$0.00	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Fans - Motor practices-1 (6-100 HP)	$/kWh	$0.00	$0.00	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Fans - Replace 100+ HP motor	$/kWh	$0.01	$0.00	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
Fans - ASD (100+ hp)	$/kWh	$0.01	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Fans - Motor practices-1 (100+ HP)	$/kWh	$0.00	$0.00	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Optimize drying process	$/kWh	$0.05	$0.01	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Power recovery	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Pumps	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pumps - O&M	$/kWh	$0.00	$0.00	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Pumps - Controls	$/kWh	$0.02	$0.00	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Pumps - System Optimization	$/kWh	$0.06	$0.01	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%
Pumps - Sizing	$/kWh	$0.02	$0.00	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Pumps - Replace 1-5 HP motor	$/kWh	$0.05	$0.01	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Pumps - ASD (1-5 hp)	$/kWh	$0.07	$0.01	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Pumps - Motor practices-1 (1-5 HP)	$/kWh	$0.02	$0.00	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Pumps - Replace 6-100 HP motor	$/kWh	$0.03	$0.00	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Pumps - ASD (6-100 hp)	$/kWh	$0.00	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Pumps - Motor practices-1 (6-100 HP)	$/kWh	$0.00	$0.00	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Pumps - Replace 100+ HP motor	$/kWh	$0.01	$0.00	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
Pumps - ASD (100+ hp)	$/kWh	$0.01	$0.00	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Pumps - Motor practices-1 (100+ HP)	$/kWh	$0.00	$0.00	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Power recovery	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Figure 14 - Measures List for Industrial Existing Electricity from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Food Measure Savings	Textiles,Apparel Measure Savings	Lumber,Furniture Measure Savings	Paper Measure Savings	Printing Measure Savings	Chemicals Measure Savings	Petroleum Measure Savings	Rubber,Plastics Measure Savings	Stone,Clay,Glass Measure Savings	Prim Metals Measure Savings	Fab Metals Measure Savings	Ind Mach Measure Savings	Electronics Measure Savings	Transp Equip Measure Savings	Misc. Measure Savings
Base Drives	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bakery - Process (Mixing) - O&M	$/kWh	$0.00	$0.00	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
O&M/drives spinning machines	$/kWh	$0.03	$0.00	0.0%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Air conveying systems	$/kWh	$0.03	$0.00	0.0%	0.0%	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Replace V-Belts	$/kWh	$0.01	$0.00	0.0%	0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Drives - EE motor	$/kWh	$0.01	$0.00	0.0%	0.0%	3.5%	3.1%	0.0%	0.0%	0.0%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gap Forming papermachine	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	7.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Consistency forming	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	7.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Optimization control PM	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient practices printing press	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient Printing press (fewer cylinders)	$/kWh	$0.05	$0.01	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Light cylinders	$/kWh	$0.06	$0.01	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient drives	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Clean Room - Controls	$/kWh	$0.02	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%
Clean Room - New Designs	$/kWh	$0.12	$0.02	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Drives - Process Controls (batch + site)	$/kWh	$0.02	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	0.0%	0.0%	2.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Process Drives - ASD	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
O&M - Extruders/Injection Moulding	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Extruders/injection Moulding-multipump	$/kWh	$0.09	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Direct drive Extruders	$/kWh	$0.28	$0.04	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Injection Moulding - Impulse Cooling	$/kWh	$0.06	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Injection Moulding - Direct drive	$/kWh	$0.09	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient grinding	$/kWh	$0.21	$0.03	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Process control	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Process optimization	$/kWh	$0.03	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Drives - Process Control	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient drives - rolling	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Drives - Optimization process (M&T)	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	10.0%	0.0%	10.0%	0.0%
Drives - Scheduling	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.5%	5.5%	5.0%	5.5%	5.0%
Machinery	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	7.0%	3.5%	10.8%	0.0%
Efficient Machinery	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%
Base Heating	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bakery - Process	$/kWh	$0.05	$0.01	37.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Drying (UV/IR)	$/kWh	$0.07	$0.01	0.0%	26.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Heat Pumps - Drying	$/kWh	$0.16	$0.02	0.0%	0.0%	22.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Top-heating (glass)	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient electric melting	$/kWh	$0.03	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Intelligent extruder (DOE)	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Near Net Shape Casting	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Heating - Process Control	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient Curing ovens	$/kWh	$0.07	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Heating - Optimization process (M&T)	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	10.0%	0.0%	10.0%	0.0%
Heating - Scheduling	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.5%	5.5%	0.0%	0.0%	0.0%
Base Refrigeration	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient Refrigeration - Operations	$/kWh	$0.01	$0.00	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Optimization Refrigeration	$/kWh	$0.10	$0.01	26.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Other Process	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other Process Controls (batch + site)	$/kWh	$0.02	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient desalter	$/kWh	$0.04	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
New transformers welding	$/kWh	$0.05	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	25.0%	0.0%	25.0%	0.0%
Efficient processes (welding, etc.)	$/kWh	$0.05	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%
Process control	$/kWh	$0.01	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%
Power recovery	$/kWh	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Centrifugal Chiller, 0.58 kW/ton, 500 t	$/ton	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Centrifugal Chiller, 0.51 kW/ton, 500 tons	$/ton	$21.14	$2.78	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%
Window Film - Chiller	$/sf-window	$3.07	$0.40	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%
EMS - Chiller	$/ton	$60.00	$7.88	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Cool Roof - Chiller	$/sf-roof	$0.47	$0.06	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
Chiller Tune Up/Diagnostics	$/ton	$16.67	$2.19	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Cooling Circ. Pumps - VSD	$/ton	$65.04	$8.55	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%

Figure 15 - Measures List for Industrial Existing Electricity from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Food Measure Savings	Textiles,Apparel Measure Savings	Lumber,Furniture Measure Savings	Paper Measure Savings	Printing Measure Savings	Chemicals Measure Savings	Petroleum Measure Savings	Rubber,Plastics Measure Savings	Stone,Clay,Glass Measure Savings	Prim Metals Measure Savings	Fab Metals Measure Savings	Ind Mach Measure Savings	Electronics Measure Savings	Transp Equip Measure Savings	Misc. Measure Savings
Base DX Packaged System, EER=10.3, 10	$/ton	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DX Tune Up/ Advanced Diagnostics	$/ton	$78.00	$10.25	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
DX Packaged System, EER=10.9, 10 tons	$/ton	$51.60	$6.78	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Window Film - DX	$/sf-window	$3.07	$0.40	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%
Evaporative Pre-Cooler	$/ton	$133.33	$17.52	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Prog. Thermostat - DX	$/ton	$5.50	$0.72	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Cool Roof - DX	$/sf-roof	$0.47	$0.06	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
Base Lighting	fixture	$0.00	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RET 2L4' Premium T8, 1EB	fixture	$25.00	$3.29	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%	31.4%
CFL Hardwired, Modular 36W	fixture	$41.70	$5.48	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%
Metal Halide, 50W	fixture	$224.70	$29.53	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%
Occupancy Sensor, 4L4' Fluorescent Fixtur	fixture	$12.25	$1.61	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Base Other	$/kWh		$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Replace V-belts	$/kWh	$0.00	$0.00	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Membranes for wastewater	$/kWh	$0.03	$0.00	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Figure 16 - Measures List for Industrial Existing Gas from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Food Measure Savings	Textiles,Apparel Measure Savings	Lumber,Furniture Measure Savings	Paper Measure Savings	Printing Measure Savings	Chemicals Measure Savings	Petroleum Measure Savings	Rubber,Plastics Measure Savings	Stone,Clay,Glass Measure Savings	Prim Metals Measure Savings	Fab Metals Measure Savings	Ind Mach Measure Savings	Electronics Measure Savings	Transp Equip Measure Savings	Misc. Measure Savings
Base Boiler	$/Therm	$0.000	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Improved process control	$/Therm	$0.018	$0.00	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Maintain boilers	$/Therm	$0.002	$0.00	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Flue gas heat recovery/economizer	$/Therm	$0.039	$0.00	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Blowdown steam heat recovery	$/Therm	$0.035	$0.00	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
Upgrade burner efficiency	$/Therm	$0.023	$0.00	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
Water treatment	$/Therm	$0.010	$0.00	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Load control	$/Therm	$0.020	$0.00	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Improved insulation	$/Therm	$0.087	$0.01	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Steam trap maintenance	$/Therm	$0.062	$0.01	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
Automatic steam trap monitoring	$/Therm	$0.049	$0.00	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Leak repair	$/Therm	$0.016	$0.00	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Condensate return	$/Therm	$0.109	$0.01	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Thermally activated heat pump/chiller	$/Therm	$0.634	$0.42	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%
Base HVAC	$/Therm	$0.000	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Improve ceiling insulation	$/Therm	$0.961	$0.10	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Install high efficiency (95%) condensing furn	$/Therm	$0.355	$0.04	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%
Stack heat exchanger	$/Therm	$0.173	$0.02	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Duct insulation	$/Therm	$0.039	$0.00	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
EMS install	$/Therm	$1.185	$0.12	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
EMS optimization	$/Therm	$0.010	$0.00	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Base CHP	$/Therm	$0.000	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Other	$/Therm	$0.000	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Base Process Heat	$/Therm	$0.000	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Process Controls & Management	$/Therm	$0.074	$0.01	8.0%	5.0%	5.0%	3.0%	5.0%	4.0%	6.0%	5.0%	7.0%	6.0%	0.0%	5.0%	5.0%	8.0%	5.0%
Heat Recovery	$/Therm	$0.864	$0.09	10.0%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	5.0%	0.0%	20.0%	20.0%	20.0%	20.0%
Efficient burners	$/Therm	$0.222	$0.02	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	20.0%	20.0%	0.0%	0.0%	0.0%	0.0%
Process integration	$/Therm	$0.987	$0.10	25.0%	0.0%	0.0%	15.0%	0.0%	13.0%	13.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient drying	$/Therm	$0.578	$0.06	13.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%
Closed hood	$/Therm	$0.395	$0.04	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Extended nip press	$/Therm	$0.869	$0.09	0.0%	0.0%	0.0%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Improved separation processes	$/Therm	$0.247	$0.02	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Thermal oxidizers	$/Therm	$2.369	$0.24	0.0%	0.0%	0.0%	0.0%	0.0%	60.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flare gas controls and recovery	$/Therm	$0.987	$0.10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fouling control	$/Therm	$0.055	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Efficient furnaces	$/Therm	$0.130	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Oxyfuel	$/Therm	$0.592	$0.06	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Batch cullet preheating	$/Therm	$0.316	$0.03	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Preventative maintenance	$/Therm	$0.010	$0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Combustion controls	$/Therm	$0.118	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%
Optimize furnace operations	$/Therm	$0.148	$0.01	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%
Insulation/reduce heat losses	$/Therm	$0.395	$0.04	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%

Figure 17- Measures List for Residential Existing Electricity from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base, 13 SEER Split-System Air Conditioner	unit	$0.00	$448.01			
15 SEER Split-System Air Conditioner	unit	$512.00	$448.01	13.3%	13.3%	13%
17 SEER Split-System Air Conditioner	unit	$1,406.00	$448.01	23.5%	23.5%	24%
Programmable Thermostat	unit	$56.37	$16.96	2.0%	2.0%	2%
Portable Fans	unit	$25.00	$0.00	5.0%	5.0%	5%
Ceiling Fans	unit	$80.00	$40.00	5.0%	5.0%	5%
Whole House Fans	unit	$243.17	$269.72	20.0%	20.0%	20%
Attic Venting	unit	$41.00	$100.00	11.0%	9.1%	7%
Proper Refrigerant Charging and Air Flow	ton	$14.11	$28.23	12.6%	10.9%	9%
Duct Repair	ton	$16.67	$91.24	8.8%	13.1%	16%
Duct Insulation	linear foot	$0.68	$2.40	4.0%	4.0%	4%
AC maintenance and repair	unit	$0.00	$125.00	4.0%	4.0%	4%
Single Pane Windows to Double Pane with Gas	sq ft	$2.25	$0.00	16.0%	16.0%	16%
Double Pane Windows to Double Pane with Gas	sq ft	$2.25	$0.00	6.0%	6.0%	6%
Attic Insulation	sq ft	$1.90	$0.00	9.0%	9.0%	9%
Ceiling R-0 to R-19 Insulation	sq ft	$0.19	$0.00	17.9%	17.9%	18%
Ceiling R-19 to R-38 Insulation	sq ft	$0.11	$0.00	2.8%	2.8%	3%
Ceiling R-0 to R-49 Insulation	sq ft	$0.50	$0.00	20.2%	20.2%	20%
Ceiling R-19 to R-49 Insulation	sq ft	$0.30	$0.00	2.8%	2.8%	3%
Wall 2x4 R-0 to Blow-In R-13 Insulation	sq ft	$0.15	$0.00	7.9%	7.9%	8%
Self Install Weatherization	home	$5.74	$0.00	2.0%	2.0%	2%
Infiltration Reduction	home	$265.63	$0.00	20.0%	20.0%	20%
Base Early Replacement 10 SEER Split-System AC	unit	$0.00	$0.00			
15 SEER Split-System AC Early Replacement	unit	$514.00		20.2%	20.2%	20%
Base Room Air Conditioner - EER 9.7	unit	$0.00	$0.00			
HE Room Air Conditioner - Energy star EER 10.8	unit	$50.00		10.2%	10.2%	10%
HE Room Air Conditioner - CEE Tier 1 EER 11.3	unit	$53.00		14.2%	14.2%	14%
Ceiling Fans	unit	$80.00	$40.00	5.0%	5.0%	5%
Whole House Fans	unit	$243.17	$0.00	20.0%	20.0%	20%
Portable Fans	unit	$25.00		5.0%	5.0%	5%
Single Pane Windows to Double Pane with Gas	sq ft	$2.25		16.0%	16.0%	16%
Double Pane Windows to Double Pane with Gas	sq ft	$2.25		6.0%	6.0%	6%
Ceiling R-0 to R-19 Insulation	sq ft	$0.19		17.9%	17.9%	18%
Ceiling R-19 to R-38 Insulation	sq ft	$0.11		2.8%	2.8%	3%
Ceiling R-0 to R-49 Insulation	sq ft	$0.50		20.2%	20.2%	20%
Ceiling R-19 to R-49 Insulation	sq ft	$0.30		2.8%	2.8%	3%
Wall 2x4 R-0 to Blow-In R-13 Insulation	sq ft	$0.15		33.1%	33.1%	33%
Self Install Weatherization	home	$10.00	$0.00	2.0%	2.0%	2%
Infiltration Reduction	home	$265.63	$0.00	6.4%	6.4%	6%
Ductless Split Heat Pump	unit	$238.92		31.7%	31.7%	33%
Base Early Replacement Room Air Conditioner- EER 9.0	Unit	$0.00	$0.00			
EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	Unit	$67.71	$0.00	18.2%	18.2%	18%
Base Dehumidifier (EF =1.20)	unit	$100.00	$0.00			
Energy Star Dehumidifier (ROB)	unit	$110.00	$0.00	20.0%	20.0%	20%
Base Furnace Fans	Unit	$0.00	$0.00			
Variable speed furnace fans (RET)	Unit	$200.00	$0.00	50.0%	50.0%	50%
Variable speed furnace fans (ROB)	Unit	$15.00	$0.00	50.0%	50.0%	50%
Base Resistance Space Heating	Unit	$0.00	$0.00			
Single Pane Windows to Double Pane with Gas	sq ft	$2.25	$0.00	32.0%	32.0%	32%
Double Pane Windows to Double Pane with Gas	sq ft	$2.25	$0.00	6.0%	6.0%	6%
Ceiling R-0 to R-38 Insulation	sq ft	$0.84	$0.00	16.7%	16.7%	17%
Ceiling R-11 to R-38 Insulaton	sq ft	$0.54	$0.00	5.0%	5.0%	5%
Ceiling R-19 to R-38 Insulation	sq ft	$0.63	$0.00	2.2%	2.2%	2%
Ceiling R-0 to R-49 Insulation	sq ft	$1.10	$0.00	17.1%	17.1%	17%
Ceiling R-19 to R-49 Insulation	sq ft	$0.66	$0.00	2.7%	2.7%	3%
Ceiling R-30 to R-49 Insulation	sq ft	$0.63	$0.00	1.2%	1.2%	1%
Wall Blow-in R-0 to R-13 Insulation	sq ft	$0.15	$1.17	33.4%	33.4%	33%
Floor R-0 to R-19 Insulation	sq ft	$0.38	$0.51	10.0%	10.0%	10%
Basement Insulation	sq ft	$0.29	$0.58	18.2%	18.2%	18%
Programmable Thermostat	unit	$56.37	$16.96	5.0%	5.0%	5%
Infiltration Reduction	sq ft	$265.63	$0.00	6.4%	8.1%	10%
Self Install Weatherization	home	$10.00	$0.00	2.0%	2.0%	2%
Ductless Split Heat Pump	sq ft	$5,734.08	$0.00	60.0%	60.0%	60%
Base Lighting 60-Watt incandescent, 1.8 hr/hday	lamp	$0.61	$0.00			
CFL (15-Watt integral ballast), 1.8 hr/day	lamp	$1.25	$0.00	75.0%	75.0%	75%
LEDs w/ Incandescent Baseline	lamp	$8.50	$0.00	90.0%	90.0%	90%
Base Lighting 15 Watt CFL, 1.8 hours per day	lamp	$1.25	$0.00			
LEDs w/ CFL Baseline	lamp	$8.50	$0.00	60.0%	60.0%	60%

Figure 18 - Measures List for Residential Existing Electricity from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base Refrigerator (18 cf w/top-mount freezer, no through-door ice)	unit	$451.00	$0.00			
HE Refrigerator - Energy Star version of above (Top Mount)	unit	$530.00	$0.00	20.0%	20.0%	20%
HE Refrigerator - CEE tier 2 (Top Mount)	unit	$630.00	$0.00	25.0%	25.0%	25%
Base Early 18 cf Top Mount Replacement Refrigerator, no through door ice	unit	$0.00	$0.00			
Refrigerator - Early Replacement Top Mount to 2008 Energy Star	unit	$94.91	$0.00	27.6%	27.6%	28%
Base Refrigerator (21 cf w/ side by side freezer, no through-door ice)	unit	$1,052.00	$0.00			
HE Refrigerator - Energy Star version of above (side by side freezer)	unit	$1,131.00	$0.00	20.0%	20.0%	20%
HE Refrigerator - CEE Tier 2 (side by side freezer)	unit	$1,231.00	$0.00	25.0%	25.0%	25%
Base Early Replacement 21 cf w/ side by side freezer	unit	$0.00	$0.00			
Refrigerator - Early Replacement w/ side by side freezer to 2008 Energy Sta	unit	$119.79	$0.00	27.6%	27.6%	28%
Base Second Refrigerator	unit	$0.00	$0.00			
Second Refrigerator Recycling	unit	$25.00	$0.00	100.0%	100.0%	100%
Base Freezer	unit	$420.00	$0.00			
Energy Star Freezer	unit	$479.99	$0.00	15.0%	15.0%	15%
Base Early Replacement Freezer	unit	$0.00	$0.00			
Early Replacement Freezer to 2008 Energy Star	unit	$75.28	$0.00	15.2%	15.2%	15%
Base 40 gal. Water Heating (EF=0.88)	unit	$251.11	$0.00			
Heat Pump Water Heater (EF=2.5)	unit	$1,539.13	$122.83	64.8%	64.8%	65%
HE Water Heater (EF=0.93)	unit	$323.41	$0.00	5.4%	5.4%	5%
Low Flow Showerhead	unit	$22.95	$15.00	7.5%	7.5%	8%
Pipe Wrap	linear foot	$0.37	$2.44	4.0%	4.0%	4%
Faucet Aerators	unit	$7.12	$5.58	3.0%	3.0%	3%
Water Heater Blanket	unit	$15.00	$10.00	10.0%	10.0%	10%
2011 Energy Star Clotheswasher (MEF 2.00)	unit	$166.24	$0.00	3.9%	4.7%	4%
Tier 3 CW (MEF=2.20)	unit	$393.16	$0.00	4.0%	4.9%	4%
Energy Star Dishwasher (EF=0.68)	unit	$143.22	$0.00	2.1%	2.1%	2%
CEE Tier 2 DW (EF=0.72)	unit	$222.56	$0.00	2.4%	2.4%	2%
Base Early Replacement Water Heating to Heat Pump Water Heater	unit	$0.00	$0.00			
Early Replacement Water Heating to Heat Pump Water Heater	unit	$1,374.36		63.6%	63.6%	64%
Base Clotheswasher (MEF=1.26)	unit	$95.39	$0.00			
Energy Star Clotheswasher (MEF 2.00)	unit	$129.15	$0.00	29.5%	29.5%	29%
Tier 3 CW (MEF=2.20)	unit	$175.23	$0.00	31.8%	31.8%	32%
Base Clothes Dryer (EF=3.01)	unit	$319.02	$0.00			
High Efficiency CD (EF=3.01 w/moisture sensor)	unit	$557.25	$0.00	15.0%	15.0%	15%
Heat Pump Dryer	unit	$2,000.00	$0.00	60.0%	60.0%	60%
Base Dishwasher (EF=0.65)	unit	$292.65	$0.00			
Base Single Speed Pool Pump (RET)	unit	$273.32	$357.12			
Variable Speed Pool Pump (1.5 hp)	unit	$707.73	$357.12	90.0%	90.0%	90%
Base Two Speed Pool Pump (1.5 hp) (ROB)	unit	$313.26	$357.12			
Variable Speed Pool Pump (1.5 hp)	unit	$707.73	$357.12	33.0%	33.0%	33%
Base Plasma Screen TV	unit	$0.00	$0.00			
Energy Star Plasma Screen TV	unit	$1.00	$0.00	30.0%	30.0%	30%
Base LCD Screen TV	unit	$0.00	$0.00			
Energy Star LCD TV	unit	$1.00	$0.00	30.0%	30.0%	30%
Base Other TV	unit	$0.00	$0.00			
Energy Star LCD TV	unit	$1.00	$0.00	40.0%	40.0%	40%
Base Laptop Computer	unit	$0.00	$0.00			
Energy Star Laptop Computer	unit	$1.00	$0.00	13.4%	13.4%	13%
Base Desktop Computer	unit	$0.00	$0.00			
Energy Star Desktop Computer	unit	$1.00	$0.00	17.9%	17.9%	18%
Base Cooking	unit	$0.00	$0.00			
Base Miscellaneous	unit	$0.00	$0.00			
Plug Load Controls - Smart Power Strip	unit	$25.00	$0.00	2.0%	2.0%	2%
Base House Practices	home	$0.00	$0.00			
Conservation Practices	home	$10.00	$0.00	2.2%	2.2%	2%

Figure 19 - Measures List for Residential New Electricity from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base Code Home - 2011 Energy Star	home	$0.00	$0.00			
2011 ENERGY STAR Home	home	$1,427.46	$0.00	19.2%	19.2%	19%

Figure 20 - Measures List for Residential Existing Gas from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base Furnace	unit	$574.38	$0.00			
Basement insulation R-13 (Furnace)	sq.ft.	$0.87	$0.00	18%	18%	18%
Ceiling R-0 to R-38 Insulation	sq.ft.	$0.62	$0.00	26%	26%	26%
Ceiling R-0 to R-49 Insulation	sq.ft.	$0.77	$0.00	29%	29%	29%
Ceiling R-11 to R-38 Insulaton	sq.ft.	$0.47	$0.00	6%	6%	6%
Ceiling R-11 to R-49 Insulation	sq.ft.	$0.62	$0.00	7%	7%	7%
Ceiling R-19 to R-38 Insulation	sq.ft.	$0.37	$0.00	3%	3%	3%
Ceiling R-19 to R-49 Insulation	sq.ft.	$0.51	$0.00	3%	3%	3%
Comprehensive Shell Air Sealing - Inf. Reduction	home	$234.37	$0.00	6%	8%	6%
Condensing Furnace - 94 AFUE (Tier 2)	unit	$974.38	$0.00	11%	11%	11%
Crawlspace insulation	sq.ft.	$0.61	$0.00	18%	18%	18%
Duct Insulation	linear ft	$0.63	$0.00	4%	0%	4%
Duct Repair and Sealing	sq.ft.home	$0.11	$0.12	10%	0%	10%
ECM Furnace Fan (variable speed motor)	Unit	$175.00	$0.00	41%	41%	41%
ENERGY STAR Programmable Thermostat	unit	$34.40	$0.00	5%	5%	5%
Floor R-0 to R-19 Insulation-Batts	sq.ft.	$1.01	$0.00	10%	10%	10%
Floor R-0 to R-30 Insulation-Batts	sq.ft.	$1.48	$0.00	12%	12%	12%
Floor R-19 to R-30 Insulation-Batts	sq.ft.	$0.94	$0.00	2%	2%	2%
Furnace controls	unit	$585.00	$0.00	12%	12%	12%
Furnace Diagnostic Testing, Repair and Maintenance	unit	$150.00	$0.00	10%	10%	10%
Plastic Film (1-2 yr measure, window kit)	sq. ft.	$0.27	$0.00	2%	2%	2%
Self Install Weatherization	home	$9.11	$0.00	4%	4%	4%
Slab insulation R-0 to R-5 (4 ft)	sq.ft.	$0.19	$0.35	9%	9%	9%
Wall 2x4 R-0 to Blow-In R-13 Insulation	sq.ft.	$0.81	$0.00	33%	33%	33%
Windows - Add Storm Windows to Double-Glazed	sq.ft.	$7.33	$16.00	5%	5%	5%
Windows - Add Storm Windows to Single-Glazed	sq.ft.	$7.33	$16.00	13%	13%	13%
WINDOWS - Double-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
Windows - Double-Glazed to Energy Star	sq.ft.	$0.53	$0.00	10%	6%	10%
WINDOWS - Energy Star With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
WINDOWS - Single-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
Base Boiler	unit	$0.00	$0.00			
Basement insulation R-13 (Boiler)	sq.ft.	$0.87	$0.00	18%	18%	18%
Boiler controls	unit	$585.00	$0.00	12%	12%	12%
Boiler Diagnostic Testing, Repair and Maintenance	unit	$150.00	$0.00	10%	10%	10%
Ceiling R-0 to R-38 Insulation	sq.ft.	$0.62	$0.00	26%	26%	26%
Ceiling R-0 to R-49 Insulation	sq.ft.	$0.77	$0.00	29%	29%	29%
Ceiling R-11 to R-38 Insulaton	sq.ft.	$0.47	$0.00	6%	6%	6%
Ceiling R-11 to R-49 Insulation	sq.ft.	$0.62	$0.00	7%	7%	7%
Ceiling R-19 to R-38 Insulation	sq.ft.	$0.37	$0.00	3%	3%	3%
Ceiling R-19 to R-49 Insulation	sq.ft.	$0.51	$0.00	3%	3%	3%
Comprehensive Shell Air Sealing - Inf. Reduction	home	$234.37	$0.00	6%	8%	6%
Crawlspace insulation	sq.ft.	$0.61	$0.00	18%	18%	18%
ENERGY STAR Programmable Thermostat	unit	$34.40	$0.00	5%	5%	5%
Floor R-0 to R-19 Insulation-Batts	sq.ft.	$1.01	$0.00	10%	10%	10%
Floor R-0 to R-30 Insulation-Batts	sq.ft.	$1.48	$0.00	12%	12%	12%
Floor R-19 to R-30 Insulation-Batts	sq.ft.	$0.94	$0.00	2%	2%	2%
High Efficiency Condensing Boiler (AFUE = 90%)	unit	$213.00	$0.00	15%	15%	15%
Pipe Insulation (Boiler)	linear foot	$0.37	$0.00	3%	3%	3%
Plastic Film (1-2 yr measure, window kit)	sq.ft.	$0.27	$0.00	2%	2%	2%
Self Install Weatherization	home	$9.11	$0.00	4%	4%	4%
Slab insulation R-0 to R-5 (4 ft)	sq.ft.	$0.19	$0.35	9%	9%	9%
Stack Damper	unit	$150.00	$69.00	4%	4%	4%
Wall 2x4 R-0 to Blow-In R-13 Insulation	sq.ft.	$0.81	$0.00	33%	33%	33%
Windows - Add Storm Windows to Double-Glazed	sq.ft.	$7.33	$16.00	5%	5%	5%
Windows - Add Storm Windows to Single-Glazed	sq.ft.	$7.33	$16.00	13%	13%	13%
WINDOWS - Double-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
Windows - Double-Glazed to Energy Star	sq.ft.	$0.53	$0.00	10%	6%	10%
WINDOWS - Energy Star With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
WINDOWS - Single-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%

Figure 21 - Measures List for Residential Existing Gas from Past Studies (cont.)

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base Room Heat	unit	$680.95	$0.00			
Basement insulation R-13 (Room Heater)	sq.ft.	$0.87	$0.00	18%	18%	18%
Ceiling R-0 to R-38 Insulation	sq.ft.	$0.62	$0.00	26%	26%	26%
Ceiling R-0 to R-49 Insulation	sq.ft.	$0.77	$0.00	29%	29%	29%
Ceiling R-11 to R-38 Insulaton	sq.ft.	$0.47	$0.00	6%	6%	6%
Ceiling R-11 to R-49 Insulation	sq.ft.	$0.62	$0.00	7%	7%	7%
Ceiling R-19 to R-38 Insulation	sq.ft.	$0.37	$0.00	3%	3%	3%
Ceiling R-19 to R-49 Insulation	sq.ft.	$0.51	$0.00	3%	3%	3%
Comprehensive Shell Air Sealing - Inf. Reduction	home	$234.37	$0.00	6%	8%	6%
Crawlspace insulation	sq.ft.	$0.61	$0.00	18%	18%	18%
ENERGY STAR Programmable Thermostat	unit	$34.40	$0.00	5%	5%	5%
Floor R-0 to R-19 Insulation-Batts	sq.ft.	$1.01	$0.00	10%	10%	10%
Floor R-0 to R-30 Insulation-Batts	sq.ft.	$1.48	$0.00	12%	12%	12%
Floor R-19 to R-30 Insulation-Batts	sq.ft.	$0.94	$0.00	2%	2%	2%
Heater Diagnostic Testing, Repair and Maintenance	unit	$123.00	$0.00	10%	10%	10%
High efficiency gas room heater	unit	$318.05	$0.00	21%	21%	21%
Plastic Film (1-2 yr measure, window kit)	sq.ft.	$0.27	$0.00	2%	2%	2%
Self Install Weatherization	home	$9.11	$0.00	4%	4%	4%
Slab insulation R-0 to R-5 (4 ft)	sq.ft.	$0.19	$0.35	9%	9%	9%
Wall 2x4 R-0 to Blow-In R-13 Insulation	sq.ft.	$0.81	$0.00	33%	33%	33%
Windows - Add Storm Windows to Double-Glazed	sq.ft.	$7.33	$16.00	5%	5%	5%
Windows - Add Storm Windows to Single-Glazed	sq.ft.	$7.33	$16.00	13%	13%	13%
WINDOWS - Double-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
Windows - Double-Glazed to Energy Star	sq.ft.	$0.53	$0.00	10%	6%	10%
WINDOWS - Energy Star With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
WINDOWS - Single-Glazed Clear With Automatic Insulating Shades	window	$50.00	$16.00	10%	6%	10%
Base Water Heating	unit	$0.00	$0.00			
Commercial Clothes Washer (2.0 MEF)	unit	$10.00	$0.00		33%	
Condensing Gas Storage water heater (0.86 EF)	unit	$1,100.00	$0.00	31%	31%	31%
Drain Water Heat Recovery (GFX)	unit	$590.00	$81.00	38%	38%	38%
Energy Star CW CEE Tier 2 (MEF=2.0)	unit	$167.00	$0.00	6%	6%	6%
Energy Star Dishwasher (EF=0.72)	unit	$459.62	$0.00	1%	1%	1%
Energy Star Water Heater	unit	$107.07	$0.00	12%	12%	12%
Faucent Aerators	unit	$2.23	$0.00	3%	3%	3%
HE Water Heater (EF=0.71)	unit	$194.00	$0.00	27%	27%	27%
Low-Flow Showerheads	unit	$22.95	$15.00	11%	11%	11%
Pipe Wrap	linear ft	$0.37	$2.44	4%	4%	4%
Solar Water Heater	unit	$2,000.00	$1,850.00	70%	70%	70%
Tankless Water Heater (Energy Star 0.82 EF)	unit	$370.64	$250.90	21%	21%	21%
Base Clothes Drying	unit	$0.00	$0.00			
Efficient Clothes Dryer (EF = .52)	unit	$242.46	$0.00	15%	15%	15%
Base Cooking	unit	$0.00	$0.00			
Convection Oven	unit	$204.00	$0.00	33%	33%	33%
EE Gas Grill	unit	$100.00	$0.00	10%	10%	10%
Base Other	unit	$0.00	$0.00			
Base House Use	home	$0.00	$0.00			
Indirect Feedback	home	$4.20	$0.00	2%	2%	2%
Direct Feedback	home	$60.07	$0.00	5%	5%	5%

Figure 22 - Measures List for Residential New Gas from Past Studies

Measure Description	Cost Units	Unit Equipment Cost	Unit Labor Cost	Single Family Measures Savings	Multifamily Measure Savings	Low Income Measure Savings
Base Code Home - ES	home	$0.00				
ENERGY STAR Home	home	$1,025.27		24.9%	24.9%	24.9%
Base Code Home - Best Practice	home	$0.00				
Best Practice Home	home	$3,030.48		47.4%	47.4%	47.4%
Base Code Home - ES	home	$0.00				
ENERGY STAR Home	home	$1,025.27		24.9%	24.9%	24.9%
Base Code Home - Best Practice	home	$0.00				
Best Practice Home	home	$3,030.48		47.4%	47.4%	47.4%

End of Memorandum