VOLUME 5:

DEMAND-SIDE RESOURCE ANALYSIS

KCP&L

INTEGRATED RESOURCE PLAN

4 CSR 240-22.050

** PUBLIC **

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SECTION 1: IDENTIFICATION OF END-USE MEASURES

1.1 IDENTIFICATION OF END-USE MEASURES

The identification of end-use measures began by stratification of Kansas City Power & Light's (KCP&L's) residential, commercial and industrial (C&I) customer classes and segments by number of customers, annual energy sales in kWh, and annual peak demand in kW. C&I customer groups were further segmented by industry. Residential customers were sub-grouped as either single or multi-family homes. Sections 1.1.1 through 1.1.3 below meet the requirements of Rule 22.050 (1) (A). and Rule 22.050 (1) (C) Once these categories were established, the end-use measures were identified as detailed in the following discussion.

1.1.1 RESIDENTIAL CUSTOMER END-USE MEASURES

In 2006, KCP&L participated in the Missouri multi-client residential lighting and appliance saturation study which was conducted by RLW Analytics (RLW). RLW is a recognized industry leader providing innovative analytical, engineering and market research consulting for energy companies and end users. The report focused on the potential for residential energy savings and identified a universe of residential sector end-use measures relevant to the State of Missouri. The City of Columbia, Missouri was used as the model location to evaluate weather sensitive end-use measures.

The results and findings of this study, "2006 Missouri Statewide Residential Lighting and Appliance Efficiency Saturation Study, Final report", (RLW MO Statewide study) dated September 15, 2006, which was prepared by RLW, is attached as Appendix 5.A.

To further refine data specific to KCP&L, RLW was also engaged to estimate the residential end-use energy savings potential within the KCP&L service territory using the end-use measures identified in the above referenced study. For this KCP&L-specific study, the City of Kansas City, Missouri was used as the model location to

evaluate weather sensitive end-use measures. RLW augmented the survey data utilized in the RLW MO Statewide study with additional information obtained by a series of telephone surveys of KCP&L's residential customers. The final report, "2007 Kansas City Power & Light Single-Family residential Potential Analysis", (RLW KCP&L study) was published on March 13, 2007 and is attached as Appendix 5.B.

Table 1 identifies the residential energy efficient end-use measures, identified and described in the RLW Missouri Statewide and the RLW KCP&L consulting studies.

Table 1: Residential End-Use Measures

RLW ID	Baseline Situation	Energy Efficient End-Use Measure	Characteristic
RLW 1	A/C Refrigerant under charged	Add refrigerant	HVAC
RLW 2	A/C Refrigerant over charged	Remove refrigerant	HVAC
RLW 3	Low evaporator airflow A	Increase duct sizes or add new ducts	HVAC
RLW 4	Low evaporator airflow B	Increase blower speed	HVAC
RLW 5	High duct leakage (25%)	Reduce duct leakage to 5%	HVAC
RLW 6	Oversized A/C units A	Size A/C units to 100% of Manual J	HVAC
RLW 7	Oversized A/C units B	Size A/C units to 100% of Manual J	HVAC
RLW 8	One inch insulation on ducts in attic	Add two more inches of insulation	Building Envelope
RLW 9	Gas heat and 13 SEER A/C	Install A/C SEER = 16	HVAC
RLW 10	Home has 13 SEER heat pump	Install Heat Pump SEER = 16	HVAC
RLW 11	Home has electric strip heat	Install Heat Pump SEER = 16	HVAC
RLW 12	Attic insulation = R-7	Add another R-23 attic insulation	Building Envelope
RLW 13	Attic insulation = R-11	Add another R-19 attic insulation	Building Envelope
RLW 14	Exposed walls not insulated	Add R-11 wall insulation	Building Envelope
RLW 15	Basement floor not insulated	Add R-19 Insulation to floor	Building Envelope
RLW 16	House infiltration = 0.8 ACH	Reduce infiltration to 0.35 ACH	Building Envelope
RLW 17	Single pane windows A	Add storm windows	Building Envelope
RLW 18	Single pane windows B	Install Low E double pane window 2904	Building Envelope
RLW 19	Standard double pane windows	Install Low E double pane window 2904	Building Envelope

RLW ID	Baseline Situation	Energy Efficient End-Use Measure	Characteristic
RLW 20	No E & W window shading A	Add solar screens to E & W glass	Building Envelope
RLW 21	No E & W window shading B	Plant deciduous trees on E & W sides	Building Envelope
RLW 22	No Compact Fluorescent Lamps	10 CFLs throughout house	Lighting and Appliances
RLW 23	Refrigerator needs to be replaced	Purchase Energy Star® refrigerator	Lighting and Appliances
RLW 24	Refrigerator early retirement	Removed unit uses no energy	Lighting and Appliances
RLW 25	Dishwasher to be replaced	Purchase Energy Star® dishwasher	Lighting and Appliances
RLW 26	Clothes washer to be replaced	Purchase Energy Star® clothes washer	Lighting and Appliances
RLW 27	No programmable thermostat	Install programmable thermostat	HVAC
RLW 28	No faucet aerators	Install faucet aerators	Domestic Water
RLW 29	No low flow shower heads	Install low flow shower heads	Domestic Water
RLW 30	Hot water pipes not insulated	Insulate hot water pipes	Domestic Water
RLW 31	Electric water heater not wrapped	Wrap electric water heater	Domestic Water

Table 2 identifies twenty additional residential end-use measures that were not included in the RLW residential studies but were identified and analyzed by KCP&L. Descriptions of these additional residential end-use measures can be found in Appendix 5.D.2. These additional end-use measures are important because they offer additional opportunities to implement DSM measures in the residential sector.

Table 2: Additional Residential End-Use Measures

Measure	Baseline Situation	Energy Efficient End-Use Measure	Characteristic
KCP&L 1	SEER = 13	Install A/C with SEER = 14	HVAC
KCP&L 2	SEER = 13	Install A/C with SEER = 15	HVAC
KCP&L 3	SEER = 13	Install A/C with SEER = 16	HVAC
KCP&L 4	SEER = 9	Install A/C SEER = 14, early replacement	HVAC
KCP&L 5	SEER = 9	Install A/C SEER = 16, early replacement	HVAC
KCP&L 6	SEER = 9	Install A/C SEER = 15, early replacement	HVAC
KCP&L 7	Operating below SEER rating (9)	Recommissioning, to 9 SEER	HVAC

Measure	Baseline Situation	Energy Efficient End-Use Measure	Characteristic
KCP&L 8	2nd Refrigerator	Refrigerator Turn In	Lighting and Appliances
KCP&L 9	Old Freezer	Freezer Turn In	Lighting and Appliances
KCP&L 10	Older Dehumidifier	Dehumidifier Turn In	Lighting and Appliances
KCP&L 11	Older Room A/C	Room A/C Turn In	Lighting and Appliances
KCP&L 12		Blue Line - in home energy monitoring device	Usage Monitoring
KCP&L 13		On Line Home Energy Analyzer with home starter energy efficiency Kit	Usage Monitoring
KCP&L 14	Non Energy Star®	New Home Energy Star® - Above standard	New Construction
KCP&L 15	Resident unaware	In Home Energy Audit	Audit
KCP&L 16	Non Energy Star®	Energy Star® New Homes	New Construction
KCP&L 17	Poor insulation	Home weatherization, Low Income	Building Envelope
KCP&L 18		Affordable New Homes	New Construction
KCP&L 19	Resident unaware	Home Energy Efficiency Starter Kit	Monitoring
KCP&L 20		Residential A/C cycling	HVAC

1.1.2 C&I CUSTOMER END-USE MEASURES

KCP&L engaged Summit Blue Consulting (SBC) to conduct an energy efficiency potential study for KCP&L's C&I market segments. Summit Blue was formed by experienced utility industry professionals, whose careers have been focused on assessing markets for demand-side management, designing and implementing effective delivery mechanisms, and evaluating programs for their energy savings impacts and efficiency of administration. Summit Blue's qualifications include all of the necessary elements to successfully complete the tasks required. Its final report, entitled "Kansas City Power & Light C&I Final Report, Energy Efficiency Measures Potential Study" was completed by SBC and was published on September 17, 2007. A copy of this report is attached as Appendix 5.C.

Table 3 identifies the C&I energy efficient end-use measures identified and described in the SBC report.

Table 3 : Commercial & Industrial End-Use Measures

Measure	Characteristic	Measure Description	Baseline
SB_C&I 1	HVAC	Hi-E Air-Cooled Chillers (1.1 kW. ton)	Std air-cooled chiller (1.35 kW/ton)
SB_C&I 2	HVAC	Hi-E Water-Cooled Chillers (0.52 kW/ton)	Std water-cooled chiller (0.67 kW/ton)
SB_C&I 3	HVAC	Integrated economizer control	Economizer 60F set point
SB_C&I 4	HVAC	Packaged cooling 11.0 EER	Packaged cooling 9.0 EER
SB_C&I 5	HVAC	Programmable Thermostats	Std Thermostat (24-hr comfort)
SB_C&I 6	HVAC	Variable frequency drive Variable primary pumping - chilled water	Single speed constant flow chilled water
SB_C&I 7	HVAC	Variable frequency drive Ventilation Fans	VAV by damper control
SB_C&I 8	Lighting	Compact Fluorescent Lamp (20W)	Incandescent (70W)
SB_C&I 9	Lighting	Compact Fluorescent Lamp, engineered can (27W)	Incandescent (88W)
SB_C&I 10	HVAC	Hi-E Water-Cooled Chillers (0.52 kW/ton)	Std water-cooled chiller (0.67 kW/ton)
SB_C&I 11	HVAC	Integrated economizer control	Economizer 60F set point
SB_C&I 12	HVAC	Packaged cooling 11.0 EER	Packaged cooling 9.0 EER
SB_C&I 13	HVAC	Programmable Thermostats	Std Thermostat (24-hr comfort)
SB_C&I 14	HVAC	Variable frequency drive Variable primary pumping – chilled water	Single speed constant flow chilled water
SB_C&I 15	HVAC	Variable frequency drive Ventilation Fans	VAV by damper control
SB_C&I 16	Lighting	Compact Fluorescent Lamp (20W)	Incandescent (70W)
SB_C&I 17	Lighting	Occupancy Sensors (8 hrs/day)	No sensors (12 hrs/day)
SB_C&I 18	Lighting	Premium T8 w/ EB (3-lamp)	T12 w/ MB (3-lamp)
SB_C&I 19	Lighting	Premium T8 w/ EB (4-lamp)	T12 w/ MB (4-lamp)

Measure	Characteristic	Measure Description	Baseline
SB_C&I 20	Lighting	PS Metal Halides	Standard Metal Halide
SB_C&I 21	Lighting	Regular T8 w/ EB (3-lamp)	T12 w/ MB (3-lamp)
SB_C&I 22	Lighting	Regular T8 w/ EB (4-lamp)	T12 w/ MB (4-lamp)
SB_C&I 23	Lighting	T5 w/ EB	T8 w/ EB (3-lamp)
SB_C&I 24	Water Heating	Heat Pump Water Heater	Standard Electric Water Heater (90%)
SB_C&I 25	Water Heating	High Efficiency Water Heater (94%)	Standard Electric Water Heater (90%)
SB_C&I 26	Water Heating	Tankless Water Heater (98%)	Standard Electric Water Heater (90%)

Morgan Marketing Partners (MMP) and its subcontractors Architectural Energy Corporation (AEC) and Franklin Energy Services (FES), were also retained by KCP&L to further review and validate the SBC C&I report and to develop cost effective (C&I) programs and measures for a portfolio of energy efficiency programs. MMP is actively involved in the tactical implementation of energy efficiency programs throughout the United States. MMP published its report and recommendations, entitled "Kansas City Power & Light C&I Energy Efficiency Programs Findings and Documentation", on January 04, 2008. MMP also identified additional residential end-use measures that were not included in the RLW reports. A copy of the report is attached as Appendix 5.D.1

The MMP report expands on the level of detail and the number of end-uses provided by SBC. Table 4 identifies the C&I energy efficient end-use measures identified and described in the MMP report. Descriptions of these end-use measures can be found in Appendix 5.D.1 with additional information in Appendix 5.D.2.

Table 4 : Commercial & Industrial End-Use Measures

Measure	Characteristic	Description
MMP 1	C&I Lighting	T-8 Fluorescent 2ft 1 lamp
MMP 2	C&I Lighting	T-8 Fluorescent 2ft 2 lamp

Measure	Characteristic	Description
MMP 3	C&I Lighting	T-8 Fluorescent 2ft 3 lamp
MMP 4	C&I Lighting	T-8 Fluorescent 2ft 4 lamp
MMP 5	C&I Lighting	T-8 Fluorescent 3ft 1 lamp
MMP 6	C&I Lighting	T-8 Fluorescent 3ft 2 lamp
MMP 7	C&I Lighting	T-8 Fluorescent 3ft 3 lamp
MMP 8	C&I Lighting	T-8 Fluorescent 3ft 4 lamp
MMP 9	C&I Lighting	T-8 Fluorescent 4ft 1 lamp
MMP 10	C&I Lighting	T-8 Fluorescent 4ft 2 lamp
MMP 11	C&I Lighting	T-8 Fluorescent 4ft 3 lamp
MMP 12	C&I Lighting	T-8 Fluorescent 4ft 4 lamp
MMP 13	C&I Lighting	T-8 Fluorescent 8ft 2 lamp
MMP 14	C&I Lighting	T-8 Fluorescent 8ft 1 lamp
MMP 15	C&I Lighting	T-8 Fluorescent HO 8 ft 1 Lamp
MMP 16	C&I Lighting	T-8 Fluorescent HO 8 ft 2 Lamp
MMP 17	C&I Lighting	Low Watt T-8 Fluorescent lamps
MMP 18	C&I Lighting	1 Lamp T-5 Fluorescent with Electronic Ballast replacing T-12
MMP 19	C&I Lighting	2 Lamp T-5 Fluorescent replacing T-12
MMP 20	C&I Lighting	3 Lamp T-5 Fluorescent replacing T-12
MMP 21	C&I Lighting	4 Lamp T-5 Fluorescent replacing T-12
MMP 22	C&I Lighting	1 Lamp T-5 Fluorescent HO with Electronic Ballast replacing T-12
MMP 23	C&I Lighting	2 Lamp T-5 Fluorescent HO replacing T-12
MMP 24	C&I Lighting	3 Lamp T-5 Fluorescent HO replacing T-12
MMP 25	C&I Lighting	4 Lamp T-5 Fluorescent HO replacing T-12
MMP 26	C&I Lighting	High Bay 3L T-5 Fluorescent HO
MMP 27	C&I Lighting	High Bay 4LT-5 Fluorescent HO
MMP 28	C&I Lighting	High Bay 6L T-5 Fluorescent HO
MMP 29	C&I Lighting	High Bay 6L T-5 Fluorescent HO - Double fixture replace 1000W HID
MMP 30	C&I Lighting	High Bay Fluorescent 4LF32 T-8 Fluorescent
MMP 31	C&I Lighting	High Bay Fluorescent 6LF32 T-8 Fluorescent
MMP 32	C&I Lighting	High Bay Fluorescent 8LF32 T-8 Fluorescent
MMP 33	C&I Lighting	High Bay Fluorescent 8LF32 T-8 Fluorescent - Double fixture replace 1000W HID
MMP 34	C&I Lighting	42W 8 Lamp Hi Bay CFL
MMP 35	C&I Lighting	Pulse Start Metal Halide -retrofit only
MMP 36	C&I Lighting	CFL Fixture
MMP 37	C&I Lighting	CFL Screw in
MMP 38	C&I Lighting	LED Exit Signs Electronic Fixtures (Retrofit Only)
MMP 39	C&I Lighting	Occupancy Sensors under 500 W
MMP 40	C&I Lighting	Occupancy Sensors over 500 W
MMP 41	C&I Lighting	LED Auto Traffic Signals
MMP 42	C&I Lighting	LED Pedestrian Signals

Measure	Characteristic	Description
MMP 43	C&I Lighting	Light Tube
MMP 44	C&I Lighting	Central Lighting Control
MMP 45	C&I Lighting	Switching Controls for Multilevel Lighting
MMP 46	C&I Lighting	Daylight Sensor controls
MMP 47	C&I HVAC	ES Sleeve A/C under 14,000 Btu hr
MMP 48	C&I HVAC	ES Sleeve A/C over 14,000 Btu hr
MMP 49	C&I HVAC	HP Water Heater 500 gal day
MMP 50	C&I HVAC	HP Water Heater 1000 gal day
MMP 51	C&I HVAC	HP Water Heater 1500 gal day
MMP 52	C&I Motors	Motors 1-5 HP - Incentives per HP
MMP 53	C&I Motors	Motors 7.5-20 HP - Incentives per HP
MMP 54	C&I Motors	Motors 25-100 HP - Incentives per HP
MMP 55	C&I Motors	Motors 125-250 HP - Incentives per HP
MMP 56	C&I Motors	Variable frequency drive HP 1.5
MMP 57	C&I Motors	Variable frequency drive HP 2
MMP 58	C&I Motors	Variable frequency drive HP 3
MMP 59	C&I Motors	Variable frequency drive HP 5
MMP 60	C&I Motors	Variable frequency drive HP 7.5
MMP 61	C&I Motors	Variable frequency drive HP 10
MMP 62	C&I Motors	Variable frequency drive HP 15
MMP 63	C&I Motors	Variable frequency drive HP 20
MMP 64	C&I Motors	Variable frequency drive HP 25
MMP 65	C&I Motors	Variable frequency drive HP 30
MMP 66	C&I Motors	Variable frequency drive HP 40
MMP 67	C&I Motors	Variable frequency drive HP 50-N6ALL
MMP 68	C&I Motors	Pumps HP 1.5
MMP 69	C&I Motors	Pumps HP 2
MMP 70	C&I Motors	Pumps HP 3
MMP 71	C&I Motors	Pumps HP 5
MMP 72	C&I Motors	Pumps HP 7.5
MMP 73	C&I Motors	Pumps HP 10
MMP 74	C&I Motors	Pumps HP 15
MMP 75	C&I Motors	Pumps HP 20
MMP 76	C&I Commercial Appliance	Commercial Clothes Washers - Washer Only
MMP 77	C&I Office & Computing	Plug Load Occupancy Sensors Document Stations
MMP 78	Refrigeration	Vending Equipment Controller
MMP 79	C&I HVAC	Window Film
MMP 80	C&I Office & Computing	80Plus PC_Desktop Unit
MMP 81	C&I Office & Computing	80Plus PC_Server Unit
MMP 82	C&I Office & Computing	Computer Power Manager

Measure	Characteristic	Description
MMP 83	Refrigeration	Anti Sweat Heater Controls
MMP 84	Refrigeration	Efficient Refrigeration Condenser
MMP 85	Refrigeration	Night covers for displays
MMP 86	Refrigeration	Head Pressure Control
MMP 87	Refrigeration	Energy Star® Commercial Solid Door Refrigerators less than20ft3
MMP 88	Refrigeration	Energy Star® Commercial Solid Door Refrigerators 20-48 ft3
MMP 89	Refrigeration	Energy Star® Commercial Solid Door Refrigerators more than 48ft3
MMP 90	Refrigeration	Energy Star® Commercial Solid Door Freezers less than 20ft3
MMP 91	Refrigeration	Energy Star® Commercial Solid Door Freezers 20-48 ft3
MMP 92	Refrigeration	Energy Star® Commercial Solid Door Freezers more than 48ft3
MMP 93	Refrigeration	Energy Efficient Ice Machines less than500 lbs
MMP 94	Refrigeration	Energy Efficient Ice Machines 500-1000 lbs
MMP 95	Refrigeration	Energy Efficient Ice Machines more than 1000 lbs
MMP 96	C&I Industrial Process	Engineered Nozzles - COMPRESS AIR
MMP 97	C&I Industrial Process	Barrel Wraps - Injection Mold & Extruders
MMP 98	C&I Industrial Process	Pellet Dryer Tanks & Ducts 3 diameter
MMP 99	C&I Industrial Process	Pellet Dryer Tanks & Ducts 4 diameter
MMP 100	C&I Industrial Process	Pellet Dryer Tanks & Ducts 5 diameter
MMP 101	C&I Industrial Process	Pellet Dryer Tanks & Ducts 6 diameter
MMP 102	C&I Industrial Process	Pellet Dryer Tanks & Ducts 8 diameter
MMP 103	C&I HVAC	Water Loop Heat Pump 17,000
MMP 104	C&I HVAC	Water Loop Heat Pump 17,000-65,000
MMP 105	C&I HVAC	Water Loop Heat Pump 65,000-135,000
MMP 106	C&I HVAC	Setback Programmable Thermostat
MMP 107	C&I HVAC	Ground Source HP Closed Loop
MMP 108	C&I HVAC	A/C 65,000 1 Ph
MMP 109	C&I HVAC	A/C 65,000 3 Ph
MMP 110	C&I HVAC	A/C 65,000 - 135,000
MMP 111	C&I HVAC	A/C 135,000 - 240,000
MMP 112	C&I HVAC	A/C 240,000 - 760,000
MMP 113	C&I HVAC	A/C 760,000

Measure	Characteristic	Description
MMP 114	C&I HVAC	Heat Pump 65,000 1 Ph
MMP 115	C&I HVAC	Heat Pump 65,000 3 Ph
MMP 116	C&I HVAC	Heat Pump 65,000 - 135,000
MMP 117	C&I HVAC	Heat Pump 135,000 - 240,000
MMP 118	C&I HVAC	Heat Pump 240,000
MMP 119	C&I HVAC	PTAC
MMP 120	C&I HVAC	PTAC-Heat Pump
MMP 121	C&I HVAC	Economizer
MMP 122	C&I HVAC	Tune-up - Refrigerant Charge
MMP 123	C&I HVAC	Chilled Water Reset Air Cooled 0-100 tons
MMP 124	C&I HVAC	Chilled Water Reset Air Cooled 100-200 tons
MMP 125	C&I HVAC	Chilled Water Reset Air Cooled 200-300 tons
MMP 126	C&I HVAC	Chilled Water Reset Air Cooled 300-400 tons
MMP 127	C&I HVAC	Chilled Water Reset Air Cooled 400-500 tons
MMP 128	C&I HVAC	Chilled Water Reset Water Cooled 0-1000 tons
MMP 129	C&I HVAC	Chilled Water Reset Water Cooled 1000-2000 tons
MMP 130	C&I HVAC	Chilled Water Reset Water Cooled 2000-3000 tons
MMP 131	C&I HVAC	Air Cooled Chillers
MMP 132	C&I HVAC	Water Cooled Chillers less than 150 ton
MMP 133	C&I HVAC	Water Cooled Chillers 150 - 300 ton
MMP 134	C&I HVAC	Water Cooled Chillers more than 300 ton

1.1.3 INTERRUPTIBLE CUSTOMERS

Interruptible customers were identified as either belonging to the residential or C&I customer classes and having the capability to reduce or shift load.

1.2 SIGNIFICANT DECISION MAKERS

KCP&L regularly conducts meetings with customers, architectural and engineering firms, building, facility and property managers, product distributors and contractors to discuss energy efficiency measures, equipment and appliance efficiency levels and to review facility total and end-use energy usage and identify demand response opportunities.

KCP&L regularly conducts meetings with architectural and engineering (A&E) firms to review KCP&L electric services, to engage discussions about the current and future

needs of the building industry as related to energy efficiency measures, equipment efficiency, demand response measures and programs, and utilization levels of the energy-using capital stock. The discussions demonstrate compliance with the requirements of Rule 22.050 (1) (B) , which includes development of programs to provide broad coverage of significant decision makers for the selection of end-use energy-using capital stock.

A list of these A&E firms can be found in Appendix 5.N

In 2007, KCP&L conducted meetings with appliance distributors, and equipment contractors, to review KCP&L electric services and DSM programs, to engage discussions about the current and future needs of the building industry as related to equipment and appliance efficiency levels.

A list of these appliance distributors, and equipment contractors can be found in Appendix 5.N

March 27-30, 2007 Greater Kansas City Home Show

KCP&L participates annually in the Greater Kansas City Home Show as an exhibitor. The 2008 home show was conducted at the Kansas City Convention Center - Bartle Hall from March 27th - 30th, 2008. The shows provides KPC&L with the opportunity to meet with many of our residential customers, to discuss how they might implement energy efficient measures in their homes, to discuss their needs and to review KCP&L's electric service and demand side management (DSM) programs with them.

Participation in this event also provides KCP&L with the opportunity to meet with the many other exhibitors that include companies that manufacture or distribute building products and appliances, or provide energy services such as home energy audits.

Other Customer Meetings

KCP&L also regularly conducts customer meetings to discuss their needs and our services, including our demand-side management programs:

Jan 24, 2007: KCP&L conducted a seminar to review our load curtailment programs which was attended by over 40 large C&I firms.

March 6, 2007: KCP&L conducted a customer seminar to discuss and review our comprehensive energy plan and demand-side management programs which was attended by 47 C&I firms.

July 18, 2007: KCP&L conducted a customer lighting seminar to review current standards and review the benefits of more efficient technology.

Aug 29, 2007: KCP&L conducted a customer seminar to review industry best practices as related to building design features, thermal integrity levels, equipment and appliance efficiency levels, and utilization levels of the energy-using capital stock. Opportunities for benchmarking customer usage against regional and national standards were also discussed.

September 14, 2007: KCP&L participated in an energy efficiency forum with over 45 participants including representatives from the educational sector, hospital, city agencies, and product manufacturers.

1.3 MAJOR END-USES

Section 1.3 and Table 1 through Table 4 above meet the requirements of Rule 22.050 Demand-Side Resource Analysis, (1) (C). The categories of end-use measures considered were:

Residential

- Lighting
- Space cooling
- Space heating
- Residential refrigeration

- Energy Star® residential appliances, including dish washers, and clothes washers.
- Water heating
- Residential building structure improvements

Table 1 and Table 2 above also list the residential end-use measures considered for evaluation.

Commercial

- Lighting systems – indoor, outdoor and traffic control
- Refrigeration and food service equipment
- Heating, ventilation, and air conditioning (HVAC)
- Motors, pumps and variable frequency drives
- Commercial Energy Star® Washing Machines
- Office equipment, both personal computer & non-personal computer
- Thermal storage

Industrial

- Lighting systems – indoor, outdoor and traffic control
- Refrigeration and food service equipment
- Heating, ventilation, and air conditioning (HVAC)
- Motors, pumps and variable frequency drives
- Industrial process equipment

Table 3 and Table 4 above lists the C&I end-use measures.

1.4 RENEWABLE ENERGY SOURCES

KCP&L investigated several renewable energy sources and associated energy technologies for incorporation into an energy efficiency program.

KCP&L commissioned The Energy Savings Store (TESS), a renewable energy services company that designs, provides, installs and maintains renewable energy systems, to model the performance of twelve small scale renewable energy systems and to estimate project costs. The results of TESS analysis can be found in its report, "A Renewable Energy System Performance Analysis Report for Kansas City Power and Light", which was published on April 21, 2008, and is attached as Appendix 5.E.

The renewable energy system technologies analyzed were:

1. 2.16 kW solar photovoltaic system
2. 3.024 kW solar photovoltaic system
3. 1.8 kW wind turbine
4. 10 kW wind turbine
5. Solar hot water system
6. Solar air heating system

Two locations in the Greater Kansas City Area were modeled for each of the six technologies listed above. One in KCP&L's North service territory (MO) and one in KCP&L's South service territory (KS).

KCP&L again engaged MMP to review the TESS report and to evaluate the cost effectiveness of the technologies listed in above. MMP published its findings in the

report "Renewables Cost Effectiveness Analysis" on June 23, 2008 which is attached as Appendix 5.F.

KCP&L also reviewed the recent report "Innovations in Wind and Solar PV Financing", technical report NREL/TP-670-42919, which was published by the National Renewable Energy Laboratory (NREL) on February 2008. This report is attached as Appendix 5.G.

As a result of this analysis, renewable energy projects have not been included as part of this proposed portfolio of programs but KCP&L will continue to evaluate renewable projects for future consideration. However, the Solar Space Heat systems are technologies that warrant continued investigation as a potential program offering. Further analysis and program discussions would be needed to finalize these numbers for a program design. More information about these technologies can be found in Appendix 5.E and Appendix 5.F. This analysis meets the requirements of 22.050 (1) (D) .

1.5 ADDITIONAL END-USE RESEARCH

1.5.1 REVIEW OF OTHER UTILITY PROGRAMS

KCP&L also conducted an extensive review of the demand and price response programs managed by the New York Independent System Operator (NYISO), the Independent System Operator-New England (ISONE), the Pennsylvania-New Jersey-Maryland Independent System Operator (PJM) and the California Independent System Operator (CAISO). Documentation about the programs and products offered by these entities can be found on its websites.

As a result of a review of these programs, KCP&L was able to analyze alternative demand response program features and benefits. KCP&L subsequently modified the features and benefits of its on-going demand response programs and customer participation has increased as a result.

The ISO New England Load Response Program manual can be downloaded from its web-site: http://www.iso-ne.com/rules_proceds/isone_mnls/index.html

The New York ISO demand response program descriptions and manuals can be downloaded from its web-site:

http://www.nyiso.com/public/products/demand_response/index.jsp

The PJM interconnection demand response program descriptions, reference materials and manuals can be downloaded from its web-site:

http://www.pjm.com/markets/demand-response/reference.html

Information about the on-going demand response initiatives in the California ISO found on its web-site:

http://www.caiso.com/1893/1893e350393b0.html

1.5.2 KCP&L- SPECIFIC DSM PROGRAM REVIEWS

KEMA, Inc. and UtiliPoint International, Inc. were retained by KCP&L to review KCP&L's demand response programs and measures. Founded in 1927, KEMA is a commercial enterprise, specializing in high-grade business and technical consultancy, inspections and measurements, testing and certification. Much of the company's work centers around innovative technology. As an independent organization, KEMA supports clients concerned with the supply and use of electrical power and other forms of energy. KEMA published its report, entitled "Price Response and Demand Response Program Portfolio", on December 18, 2006. It is attached as Appendix 5.H.

The results of this study were used to validate assumptions employed by KCP&L in developing the DSM program offerings for consideration in the Integrated Resource Plan (IRP). The results of this study were also used to enhance KCP&L's existing demand response programs.

1.5.3 KCP&L C&I DEMAND/PRICE RESPONSE PROGRAMS

KCP&L subsequently conducted a focus group with a representative segment of KCP&L's C&I customers. At this meeting, the features and benefits of our current C&I demand / price response programs and tariffs were reviewed. Alternative program features that would be mutually beneficial and help to enhance customer participation were also discussed. As a result of these discussions, KCP&L revised its existing Comprehensive Energy Plan (CEP) related MPower demand response program tariffs and on May 05, 2007, KCP&L received approval from the Missouri Public Service Commission to offer a revised MPower Tariff Rider.

1.5.4 KCP&L RESIDENTIAL DEMAND/PRICE RESPONSE PROGRAMS

KCP&L is continuing to evaluate measures and technology to assist with residential demand / price response. Kansas City Power and Light's (KCP&L's) Energy Optimizer program (or Air Conditioner Cycling program) – delivered by Honeywell DMC Services L.L.C. – helps limit growing energy demands on the system by directly controlling participants' air conditioners for up to four hours during particularly hot summer days. An evaluation of this program's performance was recently completed by Opinion Dynamics Corporation (ODC). Its findings were provided in the report "Kansas City Power and Light Energy Optimizer Evaluation – Program Year 2007", on April 11, 2008 which is attached as Appendix 5.I. The report indicates that the program is delivering cost-effective peak load reduction, and is doing so with little customer inconvenience.

1.5.5 MISCELLANEOUS END-USE RESEARCH

KCP&L compiled end-use measure information from other sources, including:

1. The Electric Power Research Institute's (EPRI) "Commercial Building Energy Efficiency and Efficient Technologies Guidebook"©, publication #1016112, technical update April 2008. For further information about EPRI or this publication, contact the EPRI Customer Assistance Center at 800.313.3774, e-

mail askepri@epri.com or contact Mr. K R Amarnath, Technical Leader, Energy Efficiency at 650.855.1007.

2. The Database for Energy Efficient Resources (DEER) which is a California Energy Commission and California Public Utilities Commission (CPUC) sponsored database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) all with one data source. The users of the data are intended to be program planners, regulatory reviewers and planners, utility and regulatory forecasters, and consultants supporting utility and regulatory research and evaluation efforts. More information about the DEER database can be found on its web-site: http://www.energy.ca.gov/deer/index.html ;

3. Energy Star® which is a joint program of the U.S. Environmental Protection Agency and the U.S Department of Energy. Its website, http://www.energystar.gov/index.cfm?fuseaction=find_a_product, identifies many residential and commercial end-use measures and products;

4. The U.S. Department of Energy, Energy Efficiency and Renewable Energy's report on "Small Wind Electric Systems, A U.S. Consumer's Guide" dated March 2005, report #DOE/GO-102005-2095.

5. Reports and studies published by the Ernest Orlando Lawrence Berkeley National Laboratory (LBNL) including: "Estimating Demand Response Market Potential among Large Commercial and Industrial Customers: A Scoping Study".

6. Reports published by Efficiency Vermont that describe the energy efficiency programs that are available to customers in Vermont and the results achieved with its program offerings. The most recent report, "2006 Results Summary" can be found on its web-site, http://www.efficiencyvermont.com/pages/Common/News/2006AnnualSummaryNowAvailable/

7. Reports published by Wisconsin's Focus-On-Energy that describe the energy efficiency programs that are available to customers in Wisconsin and the results achieved with its program offerings. Evaluation reports of its programs can be found on its web-site, http://www.focusonenergy.com/EvaluationReports/default.aspx

A review of the reports and materials listed above further assisted KCP&L in the identification and development of its list of end-use measures. It also assisted KCP&L in indentifying alternative energy efficiency program features, and benefits. This process helped KCP&L to further validate energy efficient end-use measures and DSM program design.

SECTION 2: CALCULATION OF AVOIDED COST

The DSMore "Demand Side Management Option/Risk Evaluator" (DSMore) software package, which is available from Integral Analytics, LLC, was used to evaluate the benefits and costs of the end-use measures. DSMore also calculates utility total avoided costs and all the avoided cost parameters required under rule 22.050 (2).

DSMore is an analytical tool to evaluate the economic benefits and cost of demand side end-use measures and programs. Note that KCP&L was granted a waiver described in Item 13 of "Application for Waivers Concerning Kansas City Power & Light Company's August 2008 Integrated Resource Plan Submission", Case No. EE-2008-0034, effective October 5, 2007 to be allowed to use DSMore for the required screening and evaluations of DSM programs.

2.1 SUPPLY RESOURCE COST ESTIMATES

2.1.1 AVOIDED CAPACITY COSTS

KCP&L was granted a waiver described in Item 12 from the Application for Waivers cited above to utilize the cost of a Combustion Turbine (CT) for the avoided supply-side resource cost values. This value was utilized in the DSM program screening. The levelized capital cost per kilowatt-year of a new combustion turbine (CT) generator is shown below in Table 5. The cost estimate is based on estimated capital and operating costs available in late 2007, when the DSMore model was being developed for KCP&L specific applications. This discussion meets the requirements of Rule 22.050 (2) (A)

Table 5: Avoided Capacity Cost ** HIGHLY CONFIDENTIAL **

CT Value Utilized for Avoided Cost Calculations in 2008 IRP
[redacted]

2.1.2 AVOIDED TRANSMISSION & DISTRIBUTION COST

Adequate penetration of load management programs has the potential to allow deferral of delivery system upgrades. Although this potential savings is generally based on specific circuit conditions and a specific circuit-by-circuit analysis, KCP&L assumed that some level of upgrade deferral would be possible and would provide additional avoided costs associated with DSM programs.

KCP&L's transmission & distribution (T&D) avoided costs were calculated based on the potential to delay system upgrade costs. It was assumed that adequate penetration of DSM programs could achieve a 3-year deferral on Distribution circuit upgrades and a 5-year deferral for transmission upgrades. Calculated values were expressed as the levelized capital cost per kilowatt-year. T&D projects with the potential for deferrals were used in the calculation of avoided costs. Actual project costs from 2004, 2005 & 2006, were included as well as budgeted projects for 2007 through 2012. KCP&L's T&D engineering department reviewed the circuit upgrades

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included in these budgets to identify those upgrades that potentially could have been deferred. The resulting savings and calculation of potential avoided costs are shown in Table 6, which documents a projected avoided cost value of approximately ** [redacted] ** per kilowatt-year.

Table 6: T&D Avoided Costs for DSM Screening ** HIGHLY CONFIDENTIAL **

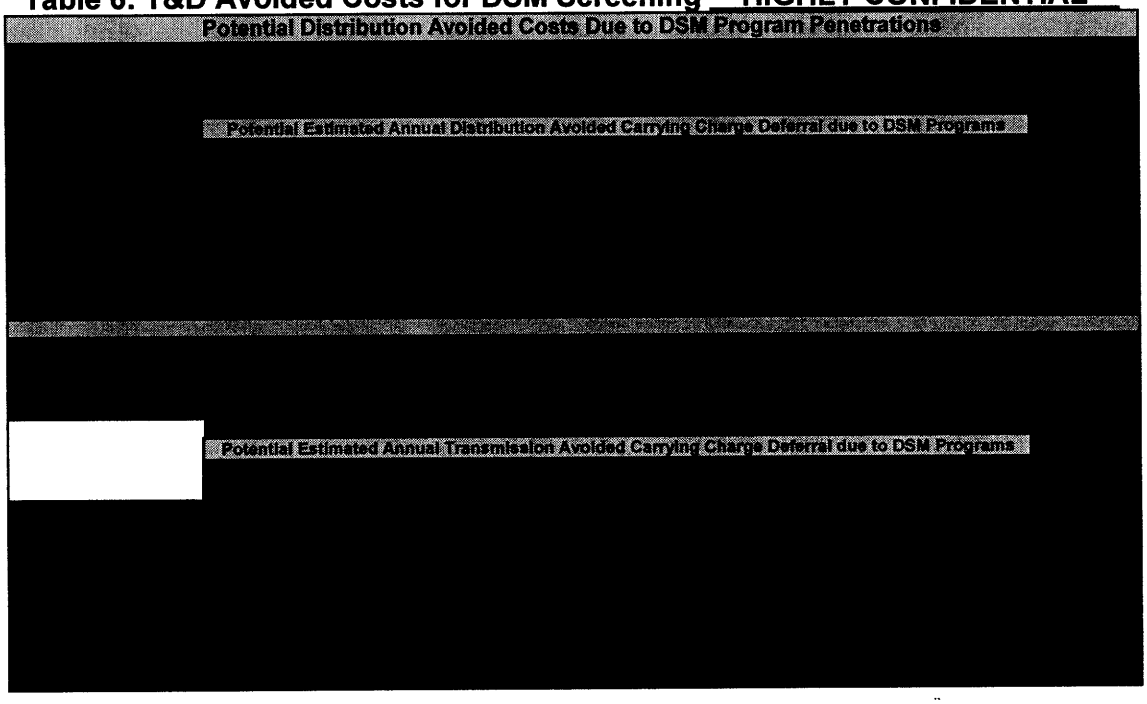

Table 5 and Table 6 fulfill the requirements of 22.050 (2) (A) 2.

2.2 AVOIDED DIRECT RUNNING COSTS

The DSMore software was used to model avoided running costs. In addition, pursuant to the variance described in item 4 of "Staff Recommendation To Grant Variances With Conditions", Case No. EE-2008-0034, dated March 7, 2008, KCP&L was granted a waiver to use energy market prices as a reasonable substitute for direct running costs. As required by this variance, a description of the MIDAS™ model used to calculate market energy prices is included in Volume 7 of the IRP filing. Section 2.2. of this report meets the requirements of Rules 22.050 (2) (A), 22.050 (2) (A) 3. and 22.050 (2) (C) 1.

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2.2.1 DIRECT RUNNING COSTS

DSMore evaluates hourly avoided costs and returns an annualized summary table including: 1) total avoided production cost, both capacity and energy costs, 2) avoided transmission & distribution cost, 3) avoided ancillary service costs, 4) total avoided costs in nominal dollars for the life-time of the end-use measure, and 5) emission costs or avoided probable environmental costs.

The avoided running costs are modeled as the avoided market price of energy, plus ancillary services and emission allowance costs. Market prices were obtained from MIDAS price forecasts supplied by KCP&L's Energy Resource Management department. A description of the MIDAS model is included in Volume 7, Risk Analysis of this IRP.

2.2.2 AVOIDED ENVIRONMENTAL COST

Avoided environmental costs were included as the projected cost of mercury emissions and future potential CO_2 regulation. Although SO_2 and NO_x emission values would increase the avoided environmental costs, these values were not originally modeled in the DSMore software. Because nearly all end-use measures were passed on to Integrated Analysis, KCP&L did not re-apply the SO_2 and NO_x values in the DSMore program. The end-use measures not passed on to Integrated Analysis were end-use renewable generation, and Residential end-uses of a) adding two more inches of attic duct insulation, b) add insulation to floor, c) purchase an Energy Star® dishwasher or d) clothes washer, e) insulate hot water pipes and f) replacing SEER 13 air conditioners with SEER 14, 15 or 16 SEER. All other end-use measures identified were passed to Integrated Analysis.

2.2.3 SUMMARY OF DIRECT RUNNING COSTS

Utility avoided cost inputs into the DSMore model include:

- An avoided capacity value of **[redacted]** in levelized dollars per kW-year. KCP&L used the levelized avoided cost of a combustion turbine (CT) generator as granted in the waiver request listed above.

- An avoided T&D value of **[redacted]** in levelized dollars per kW-year.

- Ancillary services avoided costs, which include load following and reserve margin costs.

- Environmental costs per kW-hr, which include emissions costs for mercury and CO_2 emissions.

2.3 AVOIDED COST PERIODS

DSMore uses an hourly load profile specific to each end-use measure to evaluate the avoided costs over the life of the measure. Thus each hour is implicitly defined as belonging to a specific season and as belonging to a specific time of use period, such as on-peak or off-peak. The value of energy served for each hour reflects the differences in running costs hour by hour. The type of capacity being utilized is the levelized capital cost per kilowatt-year of a new combustion turbine generator as shown in Table 5 above. The hourly load profile described above meets the requirements of Rule 22.050 (2) (B)

2.4 CALCULATION OF AVOIDED CAPACITY AND RUNNING COSTS

DSMore calculates the avoided direct running costs per kWh as the market value of energy for each hour. DSMore also calculates the avoided environmental cost on an hourly basis. The DSMore model was setup by Integral Analytics to model market prices that are specific to KCP&L. The market prices generated reflect price uncertainly through a probability distribution that provides more accurate valuations of DSM by including weather effects, and the covariance of hourly prices and loads. Section 2.4 and Section 2.2 above meet the requirements of 22.050 (2) (C).

The application of these costs is described further in Section 3.1.

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2.5 CALCULATION OF AVOIDED DEMAND AND RUNNING COSTS

Section 2.5 describes the DSMore applications that meet the requirements of 22.050 (2) (D). DSMore calculates the avoided capacity and running cost adjusted to reflect the costs associated with a reliability reserve margin as a percentage, and demand and energy system losses as a percentage. The reserve margin requirement was set to 13.6% and the demand and energy system losses were set to 7%. . These values are inputs into the DSMore model. The 13.6% reserve margin equates to SPP's 12% minimum required capacity margin as discussed in Section 1.6 of Volume 1, Executive Summary.

DSMore also allows the user to specify the coincident peak demand month and hour for both summer and winter when the probability of a loss of load is significant and is used to calculate demand period demand costs.

1. Demand period avoided demand costs include an avoided T&D demand cost of **[redacted]** and the avoided capacity cost of a new CT which was **[redacted]**.

2. DSMore creates hourly end-use load savings associated with each end use measure and calculates the total avoided cost for each hour which includes, demand period demand costs for new generation and T&D, running energy costs, and ancillary services costs. DSMore also reports the total annual avoided cost as the sum of total annual avoided production costs, total annual avoided T&D costs and total annual avoided ancillary service cost over the life of each end-use measure. DSMore also calculates the net present value (NPV) of the total annual avoided cost which is discounted at the utility cost of capital.

More information about how DSMore calculates avoided cost can be found in the DSMore user manual in Appendix 5.M. on page 28.

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SECTION 3: COST-EFFECTIVENESS SCREENING

3.1 INTRODUCTION

DSMore returns both cost-based and market-based standard practice economic benefit / cost test results for each end-use measure under evaluation. Market based results value DSM using a statistical price forecast at the hourly level and reflects more accurate valuations of DSM by including weather effects, and the associated covariance of price and load. Cost based results reflect traditional marginal production cost valuation which does not capture the value associated with market price volatility and load variance due to weather. Table 7 is a list of the cost / benefit tests. The probable environmental benefits test was used for initial screening of end-use measures.

Table 7: Economic Benefit / Cost Test Formulas
SCREENING BENEFIT-COST TESTS

Test	Formula
Total Resource Cost Test (TRC)	= (Total Avoided Cost - Arrears) / (Total Utility Program Cost + Participant Cost -Rebates)
Utility Cost Test (UCT)	= (Total Avoided Cost, Market Based + Arrears Reduced) / (Total Utility Program Cost)
Rate Impact Measure Test (RIM)	= (Total Avoided Costs, Market Based + Arrears Reduced) / (Total Utility Program Cost + Lost Revenue)
Societal Cost Test	= (Total Avoided Costs, Market Based + Arrears Reduced + Tax Savings Benefits + Total Environ Benefits) / (Total Utility Program Cost + Participant Cost – Rebates)
Participant Cost Test (PCT)	= (Total Lost Revenue + Incentives) / Participant cost
Probable Environmental Benefits Test (PEB), used for end-use measure initial screening only	= (Total Avoided Costs, Market Based + Total Environ Benefits) / (Total Utility Incentives, which excludes administration and marketing costs + Net Participant Cost after incentives)

Avoided capacity costs were modeled as the levelized cost of a CT expressed in dollars per kW-year, which was escalated to nominal costs for each year of the planning horizon.

Table 8 below lists the utility cost input values that were used by DSMore.

Table 8: DSMore Utility Cost Periods, Model Inputs And Demand Periods

Avoided Costs	Description	Values
Capacity Cost	Per granted waiver, the levelized annual value of an avoided CT	**[redacted]/kW-Yr** (2008 $'s)
T&D Costs	Value of deferred T&D system upgrades	**[redacted]/kW-Yr** (2008 $'s)
Energy Costs / Direct Running Costs	Per granted waiver, energy Market prices on an hourly basis	Varies, Supplied by MIDAS
Cost Periods	Covered by the use of hourly market prices	
Demand Periods	Covered by the waiver to apply the value of an avoided CT	
Arrears reduced (bad debt)	Used in DSMore benefits tests	KCP&L Value = $0
Rebates	Utility payments to customers for program participation	Varies by program
Total Avoided Costs (TAC)	Sum of: 1) total production costs (avoided capacity, running energy), total avoided T&D and total avoided ancillary services cost	
Environmental Benefits, Hg	Hg and CO_2 emissions cost	$ 0.0025 per kW-hr
Environmental Benefits, CO_2	Hg and CO_2 emissions cost	$0.01 per kW-hr
Reserve Margin, (ancillary services cost)	SPP reliability requirement cost	13.6% reserve margin

As required by Rule 22.050 (3), KCP&L used the Probable Environmental Cost test as the primary measure of end-use cost-effectiveness considering all costs in nominal dollars.

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3.2 END-USE MEASURE DEMAND REDUCTION AND ENERGY SAVINGS

Residential

The end-use measures described in Sections 1 and 2 above were used to develop estimates of hourly energy savings curves which were an input into the DSMore software. Residential end-use measures were provided by RLW Analytics and KCP&L as detailed above in Table 1 and Table 2.

A technical assessment of the energy saving and demand savings reductions of the end-use measures listed in Table 1 can be found in Appendix 5.B, pages 9 through 25 with a summary table on page 26.

A technical assessment of the energy saving and demand savings reductions of the end-use measures listed in Table 2 can be found in Appendix 5.D.2, pages 72 through 76.

Commercial & Industrial

C&I end-use measures were provided by SBC and MMP as detailed above in Table 3 and Table 4. A technical assessment of the energy saving and demand savings reductions identified by SBC can be found in Appendix 5.C, Sections 6 and 7, pages 32 through 44.

A technical assessment of the energy saving and demand savings reductions identified by MMP can be found in Appendices 5.D.1, 5.D.2 5.D.3.

Based on the projected peak and energy savings and the data discussed above in Sections 1 and 2, the DSMore model calculated the required benefit-cost measures including the Probable Environmental Cost test. The DSMore model and the assumptions input into the model provide the requirements of 22.050 (3) (B) and 22.050 (3) (C).

The estimates developed fulfill the requirements of Rule 22.050 (3) (A).

3.3 BENEFITS AND COSTS PER INSTALLATION FOR EACH END-USE MEASURE

The assumptions discussed in Section 1 and Section 2 above were employed through the DSMore software to meet the requirements of Rule 22.050 (3) (B) and 22.050 (3) (C). The annualized costs for end-use measures did not include marketing and delivery costs for demand-side programs or lost revenues due to measure-induced reductions in energy sales or billing demands between rate cases. The DSMore end-use screening evaluations meet the requirement of 22.050 (3) (D).

3.3.1 END-USE MEASURES NOT INCLUDED IN A DSM PROGRAM

The renewable end-use measures in Section 1.4 and described in Appendix 5.E did not pass the initial screening testing and were not found to be cost effective. These measures were not passed to Integrated Analysis. The residential end-use measures; RLW8, RLW15, and RLW30 listed in Table 1: Residential End-Use Measures did not pass the initial screening testing and were not found to be cost effective. The respective end-use measures were; a) the adding two more inches of attic duct insulation, b) add insulation to floor, and c) insulate hot water pipes. These measures were not passed to Integrated Analysis.

The residential end-use measures; KCP&L1, KCP&L2, and KCP&L3 listed in Table 2: Additional Residential End-Use Measures did not pass the initial screening testing and were not found to be cost effective. These measures were the upgrading of a SEER13 A/C unit to a SEER14, 15, or 16 A/C units. These measures were not passed to Integrated Analysis.

All other end-use measures evaluated were passed to Integrated Analysis. This action satisfies the requirement of Rule 22.050 (3) (E) and also satisfies the requirement of Rule 22.050 (3) (F).

3.4 RESULTS OF THE PROBABLE ENVIRONMENTAL BENEFITS TEST

Results of the probable environmental tests are shown in Appendix 5.L.

3.5 UTILITY BENEFITS RESULTS

For each end-use measure passing the Probable Environmental Cost test, the Utility Benefit test shall also be developed for informational purposes. Application of the DSMore model calculates the utility benefit tests and meets the requirements of Rule 22.050 (3) (G).

Results of this evaluation are included in Appendix 5.L.

SECTION 4: END-USE TECHNICAL POTENTIAL

RLW Analytics, Inc. estimated the technical potential for the residential end-use measures listed in Table 1. A technical assessment of the energy and demand savings reductions of the end-use measures listed in Table 1 can be found in Appendix 5.B, pages 9 through 25 with a summary table on page 26.

MMP estimated the technical potential for the additional residential end-use measures listed in Table 2. A technical assessment of the energy saving and demand savings reductions of the end-use measures listed in Table 2 can be found in Appendix 5.D.2, pages 72 through 76.

SBC estimated the technical potential for the C&I end-use measures listed in Table 3 on page 5. A technical assessment of the energy saving and demand savings reductions identified by SBC can be found in Appendix 5.C, Sections 6 and 7, pages 32 through 44.

MMP estimated the technical potential for the C&I end-use measures listed in Table 4. A technical assessment of the energy saving and demand savings reductions identified by MMP can be found in Appendix 5.D.1 in Sections 3 and 4, in Appendix 5.D.2, and in Appendix 5.D.3.

These estimates of technical potentials for each end-use measure meet the requirements of Rule 22.050 (4).

SECTION 5: RESEARCH ACTIVITIES

5.1 MARKET RESEARCH ACTIVITIES

The studies referenced above completed by RLW, MMP and SBC demonstrate compliance with Rule 22.050 (5). Additional market research is discussed in the subsections below.

5.2 RESIDENTIAL CUSTOMER SATISFACTION (J.D. POWER)

The annual J.D. Power and Associates residential customer satisfaction study ranks 120 large and midsize electric utilities in the United States based on the brand name promoted to the customer which is attached as Appendix 5.P. All utilities that reported having more than 125,000 residential customers are included in the study. From March 31st through May 27th, J.D. Power conducted the survey online using an updated questionnaire that measures 49 satisfaction attributes within six components.

In terms of the total U.S. electric utility industry, KCP&L ranks #14 out of 120 electric utilities surveyed. This firmly establishes KCP&L as one of the leading utilities in the country with a Customer Satisfaction Index (CSI) score in the First Quartile. Twenty-nine utilities are listed in the First Quartile.

5.3 CUSTOMER AND INDUSTRY RESEARCH STUDY

KCP&L has contracted with Stax (a market research firm) to be engaged in three areas:

1. Understand industry practices resulting in the greatest efficacy of DSM programs.

2. Determine baselines and goals for KCP&L's DSM program performance.

3. Understand customer attitudes and tradeoffs with respect to energy conservation and to develop a segmentation model based on demographic,

attitudinal, and behavioral data to be used for more effective marketing communications.

5.4 ADVERTISING EFFECTIVENESS TRACKING

In 2007, 385 KCP&L customers completed a telephone survey about KCP&L's advertising, which is attached as Appendix 5.Q. Altogether, over half of the customers recall having seen or heard KCP&L advertising in the past six months. Four in ten customers said that they were aware of some type of KCP&L advertising without prompting (unaided).

Over half of the respondents were aware of the Energy Optimizer Program, significantly more than in 2006, and approximately one-fourth were aware of the Energy Analyzer online tool that is on KCP&L's web-site.

5.5 ENERGY OPTIMIZER SATISFACTION

In April 2008, 327 Energy Optimizer customers completed an online survey that asked about program satisfaction, program drivers, demographics and suggested improvements to the program, which is attached as Appendix 5.R. Approximately two-thirds of the respondents (83%) were extremely/somewhat satisfied with the program. The top drivers why respondents signed up for the Energy Optimizer were "Saving on heating and cooling bills" (79%) and "Keeping electric rates as low as possible" (73%).

5.6 ACCOUNTLINK SATISFACTION

In May 2008, 1,561 AccountLink customers completed an online survey about the importance of KCP&L energy initiatives, which is attached as Appendix 5.S. The most important energy company initiatives for respondents are "energy at the lowest possible cost" and "best response time after power outages." The number one activity that respondents are doing to address their concern about the environment is to adjust their thermostat (84%). Also, 71% are using compact fluorescent lamps (CFLs).

5.7 WEB USABILITY RESEARCH

On an ongoing basis, KCP&L conducts web usability research with employees and customers to receive feedback on design elements which contribute to the ideal customer experience (faster task time, fewest problems, least amount of errors & highest preference ratings). Also, we solicit feedback from our customers on what features and functionality they want available on www.kcpl.com. For example, KCP&L recently created a primary navigation tab "Energy Solutions" after customers stated that the following information areas made sense being grouped together:

- How to save energy at home
- Information about customer programs and services
- Energy supply plans for the future
- Interactive energy tools and calculators

SECTION 6: DEMAND-SIDE PROGRAM DEVELOPMENT

Overview - Ongoing & Planned Demand-Side Programs.

The portfolio of programs was developed through a multi-step process. KCP&L initiated this effort by utilizing a state-wide market potential study by RLW and having an over-sampling completed so that the KCP&L service territory could be statistically represented. This data was used as an initial review of potential technologies and applications for homes in each sector. To determine cost effectiveness, KCP&L utilized DSMore, a cost effectiveness software tool. All RLW Residential electric technologies and a listing of potential C&I technologies were run through the model to determine cost effectiveness.

In addition, the RLW information was reviewed by MMP, an energy efficiency planning and consulting firm. Measures were updated for incremental costs and verification of savings to reflect changes in markets and prices. For example since the time of the RLW study the average costs for CFLs has reduced. Additional measures were also added where appropriate to expand the technology/measure listing from the original RLW study.

The last step was a combining of similar measures that would be delivered in a single program which reduces administrative and marketing delivery costs. The new "programs" were also analyzed using DSMore for cost effectiveness. The program descriptions that follow are the result of that analysis and put forth by KCP&L for consideration.

Planned new programs are both informational and direct impact programs. They target both the residential customers and the C&I customers, and target both the retrofit and new construction markets.

The incentive levels set for the measures covered by both new and planned programs have been assessed through a cost-effectiveness analysis using the DSMore model that evaluated the Total Resource Cost (TRC), Utility Cost (UCT), Ratepayer Impact Measure (RIM), Societal Cost Test (SCT) and Participant Test

(PT). The cost-effectiveness tests account for the energy and demand savings, the associated avoided costs and net benefits to KCP&L, the incremental or installed costs, and the program costs.

In addition to helping customers reduce and manage their energy costs, these programs provide other societal and customer benefits. These include reduced greenhouse gas emissions, improved levels of service from energy expenditures, and lower overall rates and energy costs compared to other resource options.

KCP&L had developed demand-side programs as part of its Comprehensive Energy Plan (CEP). These programs were approved by the Missouri Public Service Commission as part of Missouri Case EO-2005-0329 .

6.1 ON-GOING DSM PROGRAMS

These on-going programs are shown in the subsections below.

6.1.1 ON-GOING AFFORDABILTY PROGRAMS

- Low-Income Affordable New Homes Program
- Low Income Weatherization And High Efficiency Program

6.1.2 ON-GOING EFFICIENCY PROGRAMS

- Online Energy Information And Analysis Program Using Nexus® Residential Suite
- Home Performance With Energy Star®
- Change A Light– Save The World
- Cool Homes Program
- Energy Star® Homes – New Construction

- Online Energy Information And Analysis Program Using Nexus® Commercial Suite
- Energy Audit and Energy Savings Measures
    - C&I Energy Audit
    - C&I Custom Incentives
    - C&I Custom Rebate – New Construction
- Building Operator Certification Program

6.1.3 ON-GOING DEMAND RESPONSE PROGRAMS

- Air Conditioning Cycling (Energy Optimizer)
- MPower, C&I Load curtailment

6.2 PROPOSED ENHANCEMENTS TO ON-GOING PROGRAMS:

6.2.1 ENHANCED EFFICIENCY PROGRAMS

- Cool Homes Program
- Home Performance With Energy Star®
- Online Energy Information Plus – Residential
- C&I Custom Incentives
- C&I New Construction

6.3 PROPOSED NEW PROGRAMS

6.3.1 NEW EFFICIENCY PROGRAMS

- Residential Energy Use Monitor

- Appliance Turn-In Program
- C&I Prescriptive Incentive Program
- C&I Request For Proposal Program

Complete descriptions of these on-going programs, proposed enhanced programs and proposed new programs can be found in Appendix 5.O.

6.4 MARKET SEGMENTS

To meet the requirements of Rule 22.050 (6) (A) KCP&L analyzed market segments by both customer class and by end-use measure classification.

6.4.1 RESIDENTIAL SECTOR

KCP&L worked with RLW to indentify and classify KCP&L's residential market segments, and the associated end-use energy consumption profiles. Details of this research can be found in the 2006 Missouri Statewide Residential Lighting and Appliance Efficiency Saturation Study and the RLW KCP&L study which are attached as Appendix 5.A and Appendix 5.B.

The residential segments were classified as either single-family or multi-family dwellings. The single family segment was further classified by the type of heating, cooling and ventilation system utilized and by the general building envelope characteristics.

6.4.2 C&I MARKET SEGMENTS

KCP&L worked with SBC to identify and classify KCP&L's C&I market segments and the associated end-use energy consumption profiles of the segment. Details of this research can be found in sections 5, 6 and 7 of SBC's report, "Kansas City Power & Light C&I Final Report, Energy Efficiency Measures Potential Study" attached as Appendix 5.C.

Table 9 is a summary list of the market segment classification by type and the associated total 2006 energy usage.

Table 9: Peak and Energy Savings by Market Segment ** HIGHLY CONFIDENTIAL **

Market Segment	2006 MWh sales	2006 Peak MW	Rank as % of 2006 MWh Sales
Commercial, Data Center	[redacted]		
Commercial, Utilities			
Commercial, Apartment			
Commercial, Churches			
Commercial, Warehousing			
Commercial, Lodging			
Commercial, Entertainment Sector			
Commercial, Restaurant			
Commercial, Schools			
Commercial, Grocery Segment			
Commercial, Colleges			
Residential, Single Family Heat Pump			
Commercial, Communications			
Commercial, Health Care			
Residential, Single Family Strip Heat			
Commercial, Small Office			
Commercial, Retail			
Commercial, Other Tier 2/3			
Commercial, Large Office			
Industrial / Manufacturing			
Residential, Single Family Gas Heat			
Residential, Multi-Family			
Total			

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Table 10 is a summary of the total end-use consumption by market segment.

Table 10: Peak and Energy Consumption by End Use ** HIGHLY CONFIDENTIAL **

Segment & End-Use	2006 MWh	2006 Peak MW
Industrial, Electro-Chemical Processes	[redacted]	
Industrial, Other Process Use		
Industrial, Indirect Uses-Boiler Fuel		
Commercial, Cooking		
Industrial, Process Cooling and Refrigeration		
Industrial, Process Heating		
Commercial, Refrigeration		
Residential, Furnace fans		
Commercial, Water Heating		
Industrial, Other Facility Support		
Industrial, Facility Lighting		
Commercial, Ventilation		
Industrial, Facility HVAC (f)		
Residential, Television & Personal Computers		
Commercial, Space Heating		
Commercial, Office Equipment (PC)		
Residential, Other		
Residential, Water Heating		
Commercial, Office Equipment (non-PC)		
Commercial, Space Cooling		
Residential, Lighting		
Residential, Appliances		
Industrial, Machine Drive		
Residential, HVAC		
Commercial, Lighting		
Commercial, Other Uses		
Total		

These market segments are numerous, diverse and are representative of KCP&L's customer base. The classifications define characteristics and imperfections that are common to each market segment.

Section 6.4 fulfills the requirements of Rule 22.050 (6) (A).

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6.5 END-USE MEASURES INTERACTIONS

6.5.1 RESIDENTIAL SECTOR

RLW utilized the DOE-2 building simulation software model to estimate the interaction of weather sensitive residential end-use measures such as the interaction between lighting load and cooling or heating load. DOE-2 is an energy simulation program intended to aid in the analysis of energy usage in buildings. Using DOE-2, an engineer can analyze design alternatives that improve energy efficiency while maintaining thermal comfort and cost-effectiveness of buildings. By providing simple or increasingly detailed description of a building design or alternative design options, accurate estimates of the proposed building's energy consumption, interior environmental conditions and energy operation cost can be obtained. DOE-2 can be used in many applications, especially those involving design of the building envelope and HVAC systems, and selection of energy conserving or peak demand reduction alternatives. A discussion of the baseline building characteristics that were modeled, and the model methodology and results can be found in the 2006 Missouri Statewide Residential Lighting and Appliance Efficiency Saturation Study and the RLW KCP&L study which are attached as Appendix 5.A. and Appendix 5.B.

The representative set of residential building prototypes that were modeled by RLW included:

- Gas space heating with central air conditioning
- Electric (strip) resistance heating with central air conditioning.
- Electric heat pump for heating and cooling.

6.5.2 COMMERCIAL AND INDUSTRIAL SECTORS

SBC utilized the eQUEST® building simulation software model to estimate the interaction of C&I weather sensitive end-use measures such as the interaction between lighting load and cooling or heating load. Engineering estimates provided by MMP were used for non weather sensitive end-use measures.

KCP&L supplied considerable input data for this task including customer counts and billing data by market segment and sales forecasts for the Company's overall C&I customer sectors. Other data sources included Energy Insights' proprietary Energy Market Profiles data, which was available to KCP&L through their Load Analysis Strategies subscription. Energy Insights, a sub-contractor to SBC, used the results of the market profile analysis to calibrate market segment versions of the eQUEST® building simulation model. eQUEST® is a widely used commercial building simulation model based on the DOE-2 model. eQUEST® is a sophisticated, yet easy to use building energy use analysis tool which provides professional-level results with an affordable level of effort. This freeware tool was designed to allow an engineer to perform detailed analysis of today's state-of-the-art building design technologies using today's most sophisticated building energy use simulation techniques but without requiring extensive experience in the "art" of building performance modeling. This is accomplished by combining a building creation wizard, an energy efficiency measure (EEM) wizard and a graphical results display module with an enhanced DOE-2-derived building energy use simulation program.

A discussion of the baseline building model characteristics, and the model methodology and results can be found in Section 5 and 6 of SBC's report, "Kansas City Power & Light C&I Final Report, Energy Efficiency Measures Potential Study" which is attached as Appendix 5.C.

Section 6.5 fulfills the requirements of Rule 22.050 (6) (B)

6.6 DEMAND-SIDE PROGRAMS MENU

The required end-use menus are listed in Table 1, Table 2, Table 3, and Table 4 in Section 1 above. Results of the screening benefit tests are attached in Appendix 5.L. Complete descriptions of the program can be found in Appendix 5.O. The referenced Tables, Appendix 5.L and the program descriptions in Appendix 5.O fulfill the requirements of Rule 22.050 (6) (C).

6.7 MARKETING PLAN AND DELIVERY PROCESS OF END-USE MEASURES

Rule 22.050 (6) (D), requires development of marketing plans and delivery processes to present the proposed programs to members of each market segment. The marketing and delivery plans are considered key elements to the implementation of successful DSM/EE programs. Implementation plans are included in Appendix 1.C under Volume 1, Executive Summary.

SECTION 7: COST-EFFECTIVE SCREENING OF DEMAND-SIDE PROGRAMS

Rule 22.050 (7) in its entirety addresses specific applications of various cost-effectiveness tests. These requirements are all met through the above discussions and the application of the DSMore model. Results of all of the required cost and benefit tests are included in Appendix 5.L.

SECTION 8: LOAD IMPACT ESTIMATES

Rule 22.050 (8) addresses the time-differentiated load impacts and requires the level of detail to satisfy the requirements of the simulation model used for Integrated Analysis. Load impacts were provided in the format required by MIDAS™.

SECTION 9: EVALUATION OF DEMAND-SIDE PROGRAMS

9.1 OVERVIEW

Program evaluation, measurement and verification (EM&V) are key elements of KCP&L's demand-side management (DSM) programs. EM&V are used to document and measure the effects of a program and determine whether it met its goal with respect to being a reliable energy resource, EM&V are also used to help understand why certain effects occurred and identify ways to improve current programs and select future programs. Appendix 5.O includes detailed descriptions of proposed DSM/EE programs and also includes three completed studies related to measurement & verification of two existing programs: 1) Low Income Weatherization and 2) two reports summarizing results of the Compact Florescent Lightbulb program. These Appendices and the following discussions meet the requirements of Rule 22.050 (9)

The two types of evaluation utilized by KCP&L are:

- **Process evaluation:** Process evaluation assesses program delivery, from design to implementation, in order to identify bottlenecks, efficiencies, what did and did not work, constraints and potential improvements. Timeliness in identifying opportunities for improvement is essential to making corrections along the way.

- **Impact evaluation:** Impact evaluation determines the impacts (energy and demand savings) and co-benefits (avoided emissions, energy security, transmission/distribution benefits) that directly result from a program. Impact evaluations also support cost-effectiveness analyses aimed at identifying relative program costs and benefits.

The Monitoring and Verification (M&V) process acts as a quality control and quality assurance process for the savings, tracking and accounting for the program. There are two parts to M&V:

- **Monitoring**: This is the monitoring of installations when needed to determine or verify savings from a measure that is applied in a unique way, is significant in savings, or is new to the market. Working with the Evaluation Contractor, guidelines will be developed to determine which projects should be monitored.

- **Verification:** During the processing of an application for customer incentives (rebates), KCP&L will review the equipment specifications by model number to determine if that measure qualifies. This "paper" verification will occur on all applications. In addition there will be random field visits to assure the correct number and types of measures were indeed installed at the customer's facility. The field verification protocol will be a random sample of 5% of the applications up to $10,000 and a 10% sampling of projects from $10,000 to $30,000. All projects over $30,000 and all Custom Applications will be field verified. These levels will be refined with the Evaluation Contractor according to industry standard.

9.1.1 PROCESS EVALUATION

Evaluation plans are developed by KCP&L's evaluation contractor(s) and describe all necessary data collection, process evaluation tasks and impact evaluation tasks by program. Evaluation Plans include the following information:

- Study Methodology by Program
- Data Collection Strategies
- Data Requests by Program
- Detailed Work Plan and Schedule

The goal of the process evaluation component is to help improve program design and implementation processes in order to improve their effectiveness or operational efficiencies. Through the process evaluations, the evaluation contractor documents program accomplishments, administrative processes, participant experiences,

customer satisfaction and successes and failures. Process evaluation is meant to inform the program implementers, provide corrective guidance regarding program implementation and help to assess whether there is a continuing need for the programs.

Section 9.1.1 fulfills the requirements of Rule 22.050 (9) (A)

9.1.2 IMPACT EVALUATION

The goal of impact evaluation is to calculate gross program energy and demand savings. Gross program impacts are the estimated site level demand and energy savings caused by the measures installed through the program and do not account for factors such as free ridership which may influence attribution of savings to the program. Depending on the level of rigor demanded, a variety of technical issues can be addressed to determine gross program impacts, including:

- Determining the pre-installation technology performance baseline.
- Determining the standard efficiency baseline.
- Verifying that the DSM measures listed for projects were actually installed and developing an accurate count of the installed measures.
- Verifying the performance characteristics of the measures installed, and revising or computing performance variables as needed.
- Determining the demand and energy savings performance of the DSM measures installed.
- Estimating the load shapes for the DSM measures installed through the programs, including the coincidence of each DSM measure with seasonal and day type peak demand periods.
- Estimating the long-term persistence of the program's impacts.

Other technical issues associated with determining gross program impacts include assessing the quality of the data that is available to work with from program files and databases, and determining what data manipulation systems and supplemental analyses are required to produce reliable estimates of program impacts.

9.1.2.1 EVALUATION CONTRACTOR(S)

KCP&L will retain one or more evaluation contractors to perform process and impact evaluations for its programs in order to avoid conflicts of interest and to insure credibility of the evaluation results. M&V will be conducted by the implementation team with advice of the Evaluation Contractor.

9.1.2.2 PROTOCOLS FOR EVALUATING PROGRAMS

KCP&L initiated EM&V activities in conjunction with initial program design for implementing programs under the CEP Regulatory Plan. This permitted processes to be established to collect data needed for evaluation. Different methods of evaluation were planned for each program based on participation levels, kW savings, kWh savings, scope and maturity of each program. Also the level of evaluation was based on the number of evaluation and the quality of evaluation data gleaned from similar DSM programs conducted at other utility companies.

Program performance should be based on the evaluation protocol approved when the program was initially approved by the Commission at the beginning of each DSM program cycle.

Section 9.1.2 fulfills the requirements of Rule 22.050 (9) (B)

9.1.3 STANDARD M&V PROTOCOL EXPERIENCE AND BENEFIT

The International Performance Measurement and Verification Protocol (IPMPV) is a widely accepted standard for conducting on-site measurement and verification (M&V) of energy efficiency measures and programs. KCP&L supports this standard for some programs; however, it is not readily applicable to all programs.

IPMVP provides a protocol for conducting on-site M&V in support of the estimation of energy and demand impacts attributable to program measures. The protocol specifies a range of approaches with varying levels of accuracy and cost. In terms of being a widely accepted protocol for how to conduct on-site visits, it is a valuable standard.

The EM&V plans should be designed for a level of rigor (and cost) that is sufficient to demonstrate cost effective savings and other performance metrics with a degree of accuracy that is required by regulators to evaluate the programs and support policy decisions. If the level of accuracy of evaluation requires on-site M&V for a particular program or measure, then the EM&V plan should comply with the IPMVP for the on-site M&V protocols.

Section 9.1.3 fulfills the requirements of Rule 22.050 (9) (C).

9.2 EVALUATION OF THERMAL STORAGE

Pursuant to the Non-Unanimous Stipulation and Agreement, Case EO-2007-0008, dated February 13, 2007, KCP&L is attaching a case study of ice thermal storage (TS) performed in 2006 for the Richard Bolling Federal Building And the Charles Evans Whittaker United States Courthouse. Results of the study indicate that adding Ice TS to other alternatives for HVAC equipment results in increasing the life cycle cost of the HVAC equipment. The simple payback for adding the thermal storage was 27-years. Based on these results, KCP&L did not include Thermal Storage alternatives as an end-use measure in DSM/EE programs. The study is attached in Appendix 5.J.

SECTION 10: COSTS OF LOAD BUILDING PROGRAMS

KCP&L did not include load-building programs in the IRP evaluations therefore Rule 22.050 (10) has been fulfilled.

SECTION 11: REPORTING REQUIREMENTS

11.1 END-USE MEASURE IDENTIFICATION

Results are provided in Table 1 through Table 4 in Section 1: to meet the requirements of Rule 22.050 (11) (A).

11.2 END-USE MEASURE IMPACTS, COSTS, PROBABLE ENVIRONMENTAL TEST RESULTS

The requirements of this rule are included in the inputs and outputs of the DSMore model as described in various sections of this report and included in the various Appendices. The assumptions documented meet the requirements of Rule 22.050 (11) (B).

11.3 TECHNICAL POTENTIAL AND UTILITY BENEFITS TEST

The technical potential of each program is shown in Section 4 of this report. The results of benefits tests are shown in Appendix 5.L. This section fulfills the requirements of Rule 22.050 (11) (C).

11.4 DEVELOPMENT OF AVOIDED COSTS

Development of avoided costs is included in Section 2 of this report. This section fulfills the requirements of Rule 22.050 (11) (D).

11.5 MARKET RESEARCH

The studies completed by RLW, MMP and SBC document a portion of the market research completed by KCP&L. Appendix 5.C, 5.O and 5.K include additional studies related to market research as well as the additional sources of information cited in Section 5. These items fulfill the requirements of Rule 22.050 (11) (E).

11.6 MARKET SEGMENTATION

See Section 6.4 and Table 9 and Table 10 as documentation meeting the requirements of Rule 22.050 (11) (F).

11.7 DEMAND-SIDE PROGRAM DESCRIPTIONS

The descriptions of all existing and proposed demand-side programs can be found in Appendix 5.O to meet the requirements of Rule 22.050 (11) (G).

11.8 PROPOSED DEMAND-SIDE PROGRAM DATA

The data provided in Section 11.8 meets the requirements of Rule 22.050 (11) (H). It should be noted that the eight C&I programs modeled in Integrated Analysis and in Risk Analysis have been combined and condensed into the four C&I programs described below. The combining of programs simplifies development and implementation while still addressing each end-use measure included in the original eight programs.

There are five proposed Residential Energy Efficiency programs: Cool Homes, Home Performance with Energy Star, Home Energy Analyzer Plus, Energy Use Monitor – Blue Line, and Appliance Turn-In. There are four proposed C&I Efficiency programs: Custom Incentives, New Construction, RFP, and Prescriptive. Data for these programs are listed as follows:

11.8.1 COOL HOMES

Tests		
	Today's Value	Cost-Based Value
Utility Test	2.45	0.84
TRC Test	1.82	0.62
RIM Test	1.16	0.40
RIM (Net Fuel)	1.16	0.40
Societal Test	1.99	0.79
Participant Test	2.01	N/A

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Lost Revenues, Costs, and Benefits	
	Today's Value
Lost Revenue (Electric)	[redacted]
Total	
Participant Costs (net free)	
Avoided Gas Production	
Avoided Gas Capacity	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Other Benefits	
Total	

	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

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Avoided Costs (Net Free Riders) for Today Scenario					Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							

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11.8.2 HOME PERFORMANCE WITH ENERGY STAR

Tests		
	NPV (Today's) Value	Cost-Based Value
Utility Test	7.47	1.50
TRC Test	4.36	0.88
RIM Test	1.29	0.26
RIM (Net Fuel)	1.29	0.26
Societal Test	5.05	1.56
Participant Test	3.94	N/A

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Lost Revenues, Costs, and Benefits	
	NPV (Today's) Value
Net Lost Revenue (Electric)	[redacted]
Total	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Other Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

Avoided Costs (Net Free Riders) for Today Scenario					Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2010							
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028	$ -	$ -	$ -	$ -	$ -	$ -	$ -

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11.8.3 HOME ENERGY ANALYZER PLUS

Tests		
	Today's Value	Cost-Based Value
Utility Test	12.53	4.24
TRC Test	12.53	4.24
RIM Test	1.57	0.53
RIM (Net Fuel)	1.57	0.53
Societal Test	14.24	5.95
Participant Test	12.04	N/A

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Lost Revenues, Costs, and Benefits	
	Today's Value
Net Lost Revenue (Electric)	[redacted]
Total	
Tax Savings Benefits	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029	0	0	0	0	0	$ -	$ -	$ -

	Avoided Costs (Net Free Riders) for Today Scenario				Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2010							
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							

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11.8.4 ENERGY USE MONITOR – BLUE LINE

Tests		
	NPV (Today's) Value	Cost-Based Value
Utility Test	1.65	0.57
TRC Test	1.73	0.59
RIM Test	0.86	0.30
RIM (Net Fuel)	0.86	0.30
Societal Test	1.97	0.84
Participant Test	2.03	N/A

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Lost Revenues, Costs, and Benefits	
	NPV (Today's) Value
Lost Revenue (Electric)	[redacted]
Total	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Other Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								
2031								
2032								
2033								
2034								

Avoided Costs (Net Free Riders) for Today Scenario					Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							

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11.8.5 APPLIANCE TURN-IN

Tests		
	Today's Value	Cost-Based Value
Utility Test	1.42	0.49
TRC Test	1.83	0.63
RIM Test	0.80	0.28
RIM (Net Fuel)	0.80	0.28
Societal Test	2.09	0.89
Participant Test		N/A

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Lost Revenues, Costs, and Benefits	
	Today's Value
Net Lost Revenue (Electric)	[redacted]
Total	
Tax Savings Benefits	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

	Avoided Costs (Net Free Riders) for Today Scenario				Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							

HC

11.8.6 CUSTOM INCENTIVES, NEW CONSTRUCTION AND RFP PROGRAM

Tests		
	NPV (Today's) Value	Cost-Based Value
Utility Test	7.50	2.47
TRC Test	4.58	1.51
RIM Test	2.08	0.69
RIM (Net Fuel)	2.08	0.69
Societal Test	5.08	2.01
Participant Test	2.50	N/A

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Lost Revenues, Costs, and Benefits	
	NPV (Today's) Value
Lost Revenue (Electric)	[redacted]
Total	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Implementation / Participation Costs	
Incentives	
Other / Miscellaneous Costs	
Total	
Environmental Benefits	
Other Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

	Avoided Costs (Net Free Riders) for Today Scenario				Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							

Split of Program Participation					
Year	2009	2010	2011	2012	2013
Custom Incentives	98%	93%	90%	85%	85%
New Construction	2%	5%	7%	10%	10%
RFP	0%	2%	3%	5%	5%

HC

11.8.7 PRESCRIPTIVE INCENTIVE PROGRAM

Tests		
	Today's Value	Cost-Based Value
Utility Test	5.86	2.16
TRC Test	4.09	1.51
RIM Test	1.94	0.72
RIM (Net Fuel)	1.94	0.72
Societal Test	4.58	2.00
Participant Test	2.31	N/A

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Lost Revenues, Costs, and Benefits	Today's Value
Net Lost Revenue (Electric)	[redacted]
Total	
Participant Costs (net free)	
Avoided Electric Production with Adders	
Avoided T&D Electric	
Total	
Cost-Based Avoided Electric Production	
Cost-Based Avoided Electric Capacity	
Total	
Administration Costs	
Incentives	
Total	
Environmental Benefits	
Total	

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	Participation					Total Participant Costs		
Year	New Participants	New Free Riders	Cumulative Participants	Cumulative Free Riders	Cumulative Participants (net free riders)	One-Time Investment	Annual Investment	Total Costs
2010	[redacted]							
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

	Avoided Costs (Net Free Riders) for Today Scenario				Utility Program Costs		
Year	Production	T&D	Ancillary	Total	Administration	Incentives	Total
2010	[redacted]						
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							

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11.9 DEMAND-SIDE PROGRAMS UTILITY COST AND TOTAL RESOURCE COST TEST RESULTS

These test results are shown in Appendix 5.L to meet the requirements of Rule22.050 (11) (I).

11.10 DEMAND-SIDE PROCESS AND IMPACT EVALUATION PLANS

Section 9 above meets the requirements of Rule 22.050 (11) (J)..