KANSAS CITY POWER & LIGHT 2016 DSM POTENTIAL STUDY

VOLUME 4: PROGRAM POTENTIAL

FINAL REPORT

Prepared for:
Kansas City Power & Light

April 19, 2017

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AEG would also like to acknowledge the valuable contributions of
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INTRODUCTION

Kansas City Power and Light Company (KCP&L) engaged the Applied Energy Group (AEG) Team to conduct this Demand Side Management (DSM) Market Potential Study. It evaluates various categories of electricity DSM resources in the residential, commercial, and industrial sectors of KCP&L's service territory in Kansas and Missouri for the years 2019-2037. The resource categories investigated are: Energy Efficiency, Demand Response, Demand-Side Rates, and Combined Heat & Power.

The key objectives of the study are to:

- Perform a comprehensive analysis that complies with the respective statutory requirements of the Missouri Public Service Commission and the Kansas Corporation Commission
- Develop annual electricity energy and peak demand potential estimates for the DSM resource categories by customer class for each KCP&L jurisdiction for the time period of 2019 to 2037
- Develop baseline projections of annual electricity use and peak demand for each KCP&L jurisdiction, accounting for future codes and standards, naturally occurring energy efficiency, opt-out customers, smart connected devices, and combined heat and power
- Identify a subset of economic and program potential that is applicable to low-income customers
- Conduct a reliable, accurate and useful residential appliance saturation survey and C&I end-use saturation survey
- Quantify potential program savings from the DSM initiatives at various levels of cost
- Support KCP&L's effort to offer programs to all customer market segments while achieving the ultimate goal of all cost-effective demand-side savings

The study assesses various tiers of potential including technical, economic, maximum achievable, and realistic achievable potential. The study developed updated baseline estimates with the latest information on federal, state, and local codes and standards for improving energy efficiency.

As part of the study, the AEG Team conducted primary market research to collect data for the KCP&L service territory, including: end-use equipment saturation data and customer demographics and firmographics. All models and assumptions include the results from these primary market research efforts.

KCP&L will use the results of this study in its DSM and IRP planning process to optimally implement programs across its four service territories: Kansas City Power & Light Missouri (KCP&L-MO), Kansas City Power & Light Kansas (KCP&L-KS), Greater Missouri Operations Missouri Public Service (GMO-MPS), and Greater Missouri Operations St. Joseph Light & Power (GMO-SJLP).

REPORT ORGANIZATION

This report is presented in five volumes:

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Potential Analysis
- Volume 4, Program Potential
- Volume 5, Appendices

This document is Volume 4: Program Potential.

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1

DEVELOPMENT OF PROGRAM POTENTIAL

As the final step of KCP&L's 2016 DSM Market Potential Study, AEG developed Program Potential. The program-level potential is when the measure-level analysis components from the previous volumes – energy efficiency, demand response, demand side rates, and combined heat and power – are considered and bundled in an integrated and holistic manner to ascertain the total potential savings, costs, and delivery structure of an actual and realizable portfolio of DSM resources. Program potential is defined as the portion of the achievable potential that might be reasonably achieved given the realities of implementation and the constraints of program resources. It is a subset of measure-level potential that is aligned with recent program accomplishments, available future budget, and long-term strategic goals. See Figure 1-1 below for a graphical depiction of the various levels of potential from the industry standard for potential studies, the EPA's National Action Plan for Energy Efficiency.[1]

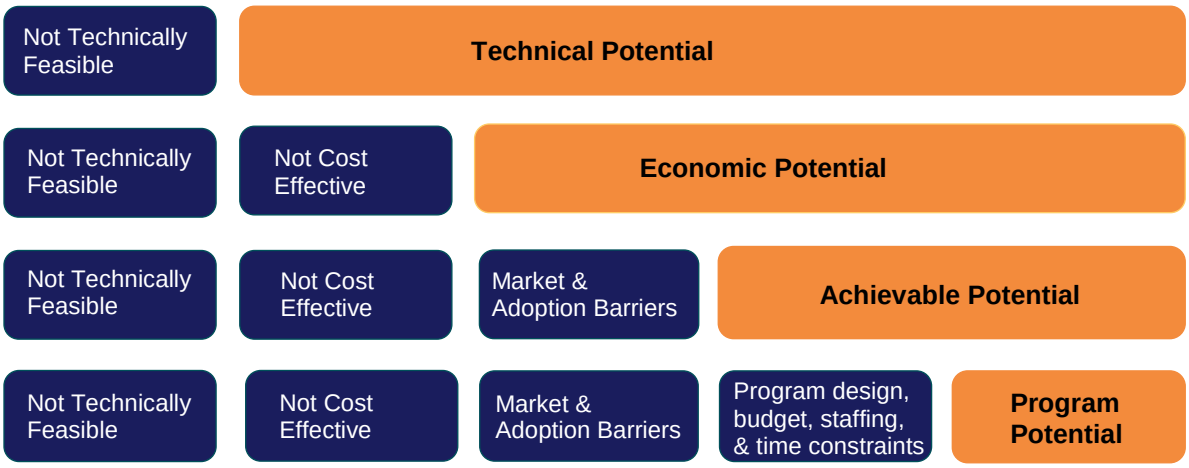

Figure 1-1 Definitions of DSM Potential

We used program design, incentive structures, marketing approaches, budgets, and levels of staffing from field experience to refine delivery assumptions and participation rates to a level that can be accomplished given KCP&L's current DSM programs; and also to reflect the ramp-up time necessary for new initiatives. Incentive amounts and administrative budgets are associated with continuing KCP&L's current program momentum as well as launching new initiatives into the marketplace. We developed these assumptions based on discussions with KCP&L staff, review of existing program data, and AEG program benchmarking research.

Specifically, when translating from the measure-level potential to program-level potential, AEG applied the following adjustments:

- Allocated measures to one or more programs, considering measure bundling.

[1] Per Missouri requirements, two levels of achievable potential are estimated: maximum and realistic. Size of Boxes not necessarily indicative of size of associated resources.

Source: National Action Plan for Energy Efficiency, "Guide to Resource Planning with Energy Efficiency." Figure 2-1. https://www.epa.gov/sites/production/files/2015-08/documents/resource_planning.pdf

- Assigned incentive and administrative program costs consistent with bundles and delivery mechanisms
- Reviewed marginally cost-effective measures (TRC benefit-to-cost ratio close to 1.0). Some non-cost-effective measures may remain in a program for market continuity purposes and to provide a robust portfolio, while other measures may be removed to improve program and portfolio cost-effectiveness.
- Excluded measures with small potential or that are challenging to implement (e.g., residential electronic equipment).
- As appropriate, considered multiple efficiency levels for technologies that may not have been part of measure-level results. For example, measure-level potential analysis selects one SEER level of residential central air conditioners to maximize absolute energy savings, but the program potential includes several tiers of SEER levels to provide a more customer-friendly set of choices and options.
- Evaluated program cost-effectiveness incorporating delivery, administration and EM&V costs. The program-level potential relied primarily on the TRC test to determine cost-effectiveness.

The proposed DSM programs deliver an effective and balanced portfolio of energy savings opportunities across all customer segments. Program eligibility has been defined broadly to make programs as inclusive as possible. In general, participation guidelines are designed to include all customer sectors and end uses. Each program was designed to leverage the optimal mix of best-practice measures, delivery strategies, and target markets in order to most effectively deliver programs and measures to KCP&L customers.

KCP&L's program portfolio uses a combination of education and customer incentives to advance energy efficiency. Customer incentives are the primary mechanism for program delivery. Customers receive rebates to purchase energy efficient equipment and services through existing market actors, including equipment dealers and retailers. To achieve the portfolio's long-term savings goals, it will be necessary for KCP&L to continue to engage customers, retailers, trade allies, and state and local agencies. Targeting retailers / trade allies and leveraging KCP&L's relationship with its stakeholders will increase program awareness among consumers and promote the market adoption of high efficiency equipment. Creative and sustained marketing is important to a successful and robust energy efficiency program portfolio.

KCP&L's programs have been aligned to offer customers consistent programs and incentives across all four service territories. This will allow KCP&L to streamline implementation and marketing activities and provide equitable programs to all of their customers, regardless of whether they are located within KCP&L-MO, KCP&L-KS, GMO-MPS, or GMO-SJLP.

The resulting portfolio of programs is listed by sector below in Table 1-1.

Table 1-1 List of Programs in KCP&L DSM Portfolio

Residential Programs	Business Programs
Home Lighting Rebate	Business Energy Efficiency Rebate - Standard
Home Energy Report	Business Energy Efficiency Rebate - Custom
Income-Eligible Home Energy Report	Strategic Energy Management
Online Home Energy Audit	Retrocommissioning
Whole House Efficiency	Block Bidding
Income-Eligible Multi-Family	Online Business Energy Audit
Income-Eligible Weatherization	Small Business Targeted
Residential Smart Thermostat with DLC	Business Smart Thermostat with DLC
Central Air Conditioner DLC Switch	Demand Response Incentive
Water Heating DLC Switch	

NOTABLE PORTFOLIO CHANGES AND ENHANCEMENTS

The proposed programs are similar to those currently being offered in the KCP&L service territory. New and enhanced initiatives in the program potential include:

- Lighting measures will generally evolve toward LED technologies and away from fluorescent technologies, most notably for screw-in lamps.
- Expansion of residential demand response programs with smart thermostats to incorporate direct load control (DLC) of central air conditioners and water heaters via DLC switches installed on equipment.
- Income-Eligible Weatherization measures are better aligned with the Missouri Weatherization Assistance Program, to allow local agencies to achieve deeper savings in more homes throughout KCP&L's service territory.
- The Business Custom program will feature a program sub-segment that targets data centers, a vibrant and growing segment in the KCP&L territories with large energy efficiency potential.
- Retrocommissioning is a new program that will be offered to business customers to optimize the controls and operations of their facilities.
- Commercial demand response program will move from switch technology to smart thermostats.

The residential and business DSM programs are described in more detail in Table 1-2 and Table 1-3.

Table 1-2 Summary of Residential DSM Programs

Residential Programs	High-Level Description
Home Lighting Rebate	Instant incentives at qualifying retailers for standard and specialty LEDs.
Home Energy Report	Behavioral program utilizing customized energy reports with peer comparisons sent periodically to households to encourage energy efficient behaviors.
Income-Eligible Home Energy Report	Behavioral program utilizing customized energy reports with peer comparisons sent periodically to households to encourage energy efficient behaviors. Targets low-income customer segment.
Online Home Energy Audit	Online energy audit tool.
Whole House Efficiency	A holistic program that aims at increasing efficiency across multiple systems in a customer's home, with measures that affect all end uses and building shell.
Income-Eligible Multi-Family	The program aims to provide direct install measures in housing units and common area measures to multi-family buildings, targeting low-income customers.
Income-Eligible Weatherization	The program leverages the Missouri Weatherization Assistance Program to provide qualifying customers with approved energy efficiency measures and equipment. Targets low-income customers and provides fully subsidized measures.
Residential Smart Thermostat with DLC	Direct load control program that modifies heating and cooling temperature settings and curtails HVAC equipment by way of a smart, communicating thermostat. Targets peak demand reductions during DR events, but also has energy savings from occupancy sensors and schedules with learning algorithms.
Central Air Conditioner DLC Switch	Direct load control program that cycles and curtails central air conditioners by way of a remote-controlled switch to provide peak demand reductions during DR events.
Water Heating DLC Switch	Direct load control program that cycles and curtails electric water heaters by way of a remote-controlled switch to provide peak demand reductions during DR events.

Table 1-3 Summary of Business DSM Programs

Business Programs	High-Level Description and Notes
Business Energy Efficiency Rebate - Standard	Customers receive incentives by installing efficient measures from a pre-qualified list of options.
Business Energy Efficiency Rebates - Custom	Customers receive incentives for installing efficient measures not explicitly identified in the Standard program. The measures are pre-approved by the implementer through an application and review process prior to installation. Incentives are paid based on a dollar per unit of energy saved basis.
Strategic Energy Management	Provide energy education, technical assistance, and coaching for commercial and industrial customers in order to drive behavioral change and transformation of the company culture.
Retrocommissioning	Initial or ongoing monitoring of building energy systems and operations to optimize energy use, focusing at least initially on low-cost or no-cost measures and actions.
Block Bidding	The utility purchases large blocks of electricity savings by issuing an RFP to eligible customers and third-party suppliers, representing reduced electric usage from non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs.
Online Business Energy Audit	Online energy audit tool.
Small Business Targeted	Small business customers that typically do not have the staffing or financial resources to engage in energy efficiency receive targeted marketing and incentives up to 70% of the installed equipment cost for qualifying measures.
Business Smart Thermostat with DLC	Direct load control program that modifies heating and cooling temperature settings and curtails HVAC equipment by way of a smart, communicating thermostat. Targets peak demand reductions during DR events, but also has energy savings from occupancy sensors and schedules with learning algorithms.
Demand Response Incentive	Interruptible tariff program for customers that can reduce load by at least 25 kW during times of system peak congestion.

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PORTFOLIO IMPACTS AND BUDGETS

In keeping with the structure of the preceding analysis components, program potential was developed for Program RAP and Program MAP. Two additional portfolios, RAP- and RAP+ (pronounced "RAP minus" and "RAP plus"), are extrapolated based on those program-level RAP and MAP portfolios in order to provide KCP&L with a more diverse set of planning cases. RAP- represents participation levels that are approximately 75% of the RAP scenario, while RAP+ represents participation levels at the average or midpoint between RAP and MAP. This results in the following set of scenarios from lowest to highest participation levels:

- Program RAP- (approximately 75% of RAP participation levels)
- Program RAP
- Program RAP+ (approximate average of RAP and MAP participation levels)
- Program MAP

Tables 2-1 through 2-5 below present high-level summaries of each scenario's budget, cumulative energy savings, and cumulative summer peak demand savings for all of KCP&L as well as broken out by service territory. Following this, tables 2-6 through 2-10 present additional detail for the RAP scenario for the combined KCP&L Company and subsequently by service territory.[2]. This includes the annual budget and incremental energy and demand savings by program for the first 3 years of the analysis horizon (2019-2021). For additional detail by program and scenario, please see the final chapter of the Volume 5 appendices.

[2] Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective.

Table 2-1 Program Potential Case Summary – All KCP&L Service Territories

All KCP&L Service Territories	2019	2020	2021	2030	2037
Total Budget (000s)					
Program RAP-	$25,285	$27,691	$30,952	$33,826	$45,437
Program RAP	$36,323	$39,844	$44,427	$49,637	$67,541
Program RAP+	$46,845	$50,658	$56,201	$65,829	$90,043
Program MAP	$59,724	$64,642	$71,256	$86,368	$118,746
Net Cumulative Energy Savings (MWh)					
Program RAP-	135,266	220,256	307,938	1,010,795	1,450,099
Program RAP	177,284	287,497	401,301	1,312,666	1,886,204
Program RAP+	205,504	333,098	465,043	1,536,543	2,258,677
Program MAP	233,418	378,027	527,741	1,744,232	2,578,995
Net Cumulative Summer Peak Demand Savings (MW)					
Program RAP-	149	207	267	520	591
Program RAP	198	274	354	688	780
Program RAP+	206	305	395	779	895
Program MAP	215	336	436	867	1,001
Energy Savings as % of Baseline					
Program RAP-	0.6%	0.9%	1.3%	4.2%	5.6%
Program RAP	0.8%	1.2%	1.7%	5.4%	7.3%
Program RAP+	0.9%	1.4%	2.0%	6.3%	8.8%
Program MAP	1.0%	1.6%	2.3%	7.2%	10.0%
Summer Peak Demand Savings as % of Baseline					
Program RAP-	2.7%	3.7%	4.7%	8.9%	9.6%
Program RAP	3.6%	4.9%	6.3%	11.7%	12.7%
Program RAP+	3.7%	5.5%	7.0%	13.3%	14.6%
Program MAP	3.9%	6.0%	7.8%	14.8%	16.3%

Table 2-2 Program Potential Case Summary – KCP&L-MO

KCP&L-MO	2019	2020	2021	2030	2037
Total Budget (000s)					
Program RAP-	$8,472	$9,154	$10,146	$11,221	$14,356
Program RAP	$12,223	$13,230	$14,636	$16,504	$21,303
Program RAP+	$15,772	$16,882	$18,557	$21,988	$28,369
Program MAP	$20,415	$21,852	$23,846	$29,145	$37,761
Net Cumulative Energy Savings (MWh)					
Program RAP-	45,700	77,098	109,420	365,282	513,042
Program RAP	60,026	100,982	143,171	476,533	667,556
Program RAP+	68,846	115,867	164,359	551,159	794,886
Program MAP	77,556	130,535	185,223	619,710	898,183
Net Cumulative Summer Peak Demand Savings (MW)					
Program RAP-	47	70	94	189	212
Program RAP	62	93	125	250	280
Program RAP+	64	99	134	281	320
Program MAP	67	105	142	312	356

Table 2-3 Program Potential Case Summary – KCP&L-KS

KCP&L-KS	2019	2020	2021	2030	2037
Total Budget (000s)					
Program RAP-	$6,865	$7,636	$8,673	$9,577	$14,165
Program RAP	$9,909	$11,015	$12,472	$14,074	$21,165
Program RAP+	$12,988	$14,186	$15,962	$18,778	$28,437
Program MAP	$16,725	$18,276	$20,407	$24,464	$37,194
Net Cumulative Energy Savings (MWh)					
Program RAP-	37,175	60,616	84,861	285,703	426,501
Program RAP	48,711	79,094	110,544	369,713	551,349
Program RAP+	58,043	94,101	131,484	444,183	675,287
Program MAP	67,334	108,979	152,211	510,304	773,032
Net Cumulative Summer Peak Demand Savings (MW)					
Program RAP-	29	47	67	147	171
Program RAP	39	62	89	195	225
Program RAP+	42	79	109	222	261
Program MAP	46	97	130	248	292

Table 2-4 Program Potential Case Summary – GMO-MPS

GMO-MPS	2019	2020	2021	2030	2037
Total Budget (000s)					
Program RAP-	$7,544	$8,236	$9,188	$9,836	$12,816
Program RAP	$10,794	$11,830	$13,158	$14,492	$19,079
Program RAP+	$13,813	$14,897	$16,532	$19,024	$25,316
Program MAP	$17,253	$18,660	$20,622	$24,854	$33,342
Net Cumulative Energy Savings (MWh)					
Program RAP-	40,827	63,506	86,954	273,033	386,503
Program RAP	53,576	82,945	113,343	355,231	506,468
Program RAP+	61,499	95,192	130,118	412,399	598,612
Program MAP	69,313	107,217	146,553	468,626	689,695
Net Cumulative Summer Peak Demand Savings (MW)					
Program RAP-	53	66	78	138	157
Program RAP	71	88	104	183	207
Program RAP+	73	93	113	207	237
Program MAP	75	99	122	232	267

Table 2-5 Program Potential Case Summary – GMO-SJLP

GMO-SJLP	2019	2020	2021	2030	2037
Total Budget (000s)					
Program RAP-	$2,404	$2,664	$2,945	$3,192	$4,100
Program RAP	$3,396	$3,769	$4,161	$4,566	$5,994
Program RAP+	$4,273	$4,693	$5,150	$6,040	$7,922
Program MAP	$5,331	$5,854	$6,381	$7,904	$10,449
Net Cumulative Energy Savings (MWh)					
Program RAP-	11,563	19,036	26,702	86,776	124,052
Program RAP	14,970	24,475	34,243	111,189	160,831
Program RAP+	17,116	27,937	39,082	128,802	189,892
Program MAP	19,214	31,296	43,754	145,592	218,086
Net Cumulative Summer Peak Demand Savings (MW)					
Program RAP-	20	24	28	46	51
Program RAP	26	31	37	61	68
Program RAP+	27	33	39	68	77
Program MAP	27	35	42	76	87

Table 2-6 *RAP Program Pote*ntial Summary – All Service Territories

Program	Total Budget (000s)			Net Incremental Energy Savings (MWh)			Net Incremental Peak Demand Savings (MW)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Home Lighting Rebate	$3,028	$2,242	$2,136	35,804	12,716	12,215	3.18	1.13	1.09
Home Energy Report	$1,444	$1,444	$1,444	34,766	34,766	34,766	15.96	15.96	15.96
Income-Eligible Home Energy Report	$462	$462	$462	9,100	9,100	9,100	4.26	4.26	4.26
Online Home Energy Audit	$336	$336	$336	-	-	-	-	-	-
Whole House Efficiency	$5,103	$5,145	$5,184	15,975	13,666	13,781	3.93	3.75	3.80
Income-Eligible Multi-Family	$1,344	$1,344	$1,344	1,921	1,585	1,585	0.37	0.34	0.34
Income-Eligible Weatherization	$1,752	$1,772	$1,792	3,037	2,465	2,521	0.12	0.06	0.06
Residential Smart Thermostat w DLC	$4,855	$6,645	$9,663	3,761	4,813	7,199	59.57	80.77	97.62
Central AC DLC Switch	$2,584	$4,091	$5,036	-	-	-	9.12	23.49	40.12
Water Heating DLC Switch	$1,386	$2,194	$2,670	-	-	-	1.75	4.53	7.72
Business Energy Efficiency Rebate - Standard	$5,741	$5,775	$5,812	32,322	34,430	34,654	5.25	5.56	5.59
Business Energy Efficiency Rebate - Custom	$3,813	$3,842	$3,871	17,929	18,074	18,219	4.62	4.66	4.70
Strategic Energy Management	$723	$723	$723	4,263	4,263	4,263	0.85	0.85	0.85
Retrocommissioning	$927	$927	$927	5,035	5,035	5,035	1.01	1.01	1.01
Block Bidding	$1,257	$1,257	$1,257	8,802	8,802	8,802	1.53	1.53	1.53
Online Business Energy Audit	$84	$84	$84	-	-	-	-	-	-
Small Business Targeted	$1,052	$1,053	$1,056	2,859	2,133	2,149	0.52	0.42	0.42
Business Smart Thermostat w DLC	$173	$220	$301	1,711	2,232	3,422	1.44	2.10	2.65
Demand Response Incentive	$259	$289	$330	-	-	-	84.14	102.49	125.46
Total Residential	$22,294	$25,673	$30,066	104,362	79,111	81,167	98.25	134.29	170.96
Total Business	$14,029	$14,171	$14,361	72,921	74,968	76,544	99.35	118.61	142.21
Total Portfolio	**$36,323**	**$39,844**	**$44,427**	**177,284**	**154,079**	**157,710**	**197.60**	**252.90**	**313.17**

Table 2-7 RAP Program Potential Summary – KCP&L-MO

Program	Total Budget (000s)			Net Incremental Energy Savings (MWh)			Net Incremental Peak Demand Savings (MW)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Home Lighting Rebate	$850	$634	$607	9,985	3,508	3,378	0.89	0.31	0.30
Home Energy Report	$402	$402	$402	9,579	9,579	9,579	4.42	4.42	4.42
Income-Eligible Home Energy Report	$148	$148	$148	2,928	2,928	2,928	1.37	1.37	1.37
Online Home Energy Audit	$84	$84	$84	-	-	-	-	-	-
Whole House Efficiency	$1,361	$1,370	$1,379	4,361	3,575	3,599	0.98	0.91	0.92
Income-Eligible Multi-Family	$494	$494	$494	776	641	641	0.15	0.14	0.14
Income-Eligible Weatherization	$571	$571	$591	1,031	847	874	0.04	0.02	0.02
Residential Smart Thermostat w DLC	$1,521	$2,053	$2,999	1,161	1,472	2,227	19.99	26.33	31.39
Central AC DLC Switch	$827	$1,293	$1,602	-	-	-	2.92	7.46	12.75
Water Heating DLC Switch	$293	$457	$536	-	-	-	0.36	0.94	1.58
Business Energy Efficiency Rebate - Standard	$2,304	$2,315	$2,326	13,304	14,143	14,217	2.18	2.30	2.31
Business Energy Efficiency Rebate - Custom	$1,986	$1,996	$2,006	9,599	9,649	9,698	2.48	2.49	2.50
Strategic Energy Management	$248	$248	$248	1,470	1,470	1,470	0.29	0.29	0.29
Retrocommissioning	$302	$302	$302	1,640	1,640	1,640	0.33	0.33	0.33
Block Bidding	$347	$347	$347	2,515	2,515	2,515	0.44	0.44	0.44
Online Business Energy Audit	$21	$21	$21	-	-	-	-	-	-
Small Business Targeted	$342	$343	$343	1,008	678	680	0.18	0.13	0.13
Business Smart Thermostat w DLC	$62	$77	$108	669	818	1,265	0.36	0.62	0.85
Demand Response Incentive	$60	$78	$95	-	-	-	24.68	37.04	49.54
Total Residential	$6,551	$7,504	$8,840	29,821	22,550	23,226	31.12	41.90	52.88
Total Business	$5,672	$5,726	$5,796	30,205	30,913	31,485	30.93	43.64	56.39
Total Portfolio	**$12,223**	**$13,230**	**$14,636**	**60,026**	**53,463**	**54,711**	**62.04**	**85.54**	**109.28**

Table 2-8 RAP Program Potential Summary – KCP&L-KS

Program	Total Budget (000s)			Net Incremental Energy Savings (MWh)			Net Incremental Peak Demand Savings (MW)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Home Lighting Rebate	$985	$722	$682	11,674	4,170	3,983	1.04	0.37	0.35
Home Energy Report	$377	$377	$377	10,046	10,046	10,046	4.57	4.57	4.57
Income-Eligible Home Energy Report	$68	$68	$68	1,409	1,409	1,409	0.65	0.65	0.65
Online Home Energy Audit	$84	$84	$84	-	-	-	-	-	-
Whole House Efficiency	$1,056	$1,074	$1,091	3,393	3,003	3,052	0.83	0.81	0.83
Income-Eligible Multi-Family	$367	$367	$367	448	375	375	0.09	0.08	0.08
Income-Eligible Weatherization	$236	$236	$236	348	268	273	0.02	0.01	0.01
Residential Smart Thermostat w DLC	$1,525	$2,089	$2,998	1,177	1,511	2,227	19.01	25.63	30.78
Central AC DLC Switch	$813	$1,292	$1,601	-	-	-	2.87	7.40	12.70
Water Heating DLC Switch	$437	$686	$870	-	-	-	0.55	1.42	2.46
Business Energy Efficiency Rebate - Standard	$1,856	$1,873	$1,893	10,073	10,854	10,962	1.64	1.77	1.78
Business Energy Efficiency Rebate - Custom	$780	$794	$808	3,530	3,601	3,671	0.91	0.93	0.95
Strategic Energy Management	$201	$201	$201	1,176	1,176	1,176	0.24	0.24	0.24
Retrocommissioning	$273	$273	$273	1,476	1,476	1,476	0.30	0.30	0.30
Block Bidding	$345	$345	$345	2,515	2,515	2,515	0.44	0.44	0.44
Online Business Energy Audit	$21	$21	$21	-	-	-	-	-	-
Small Business Targeted	$401	$402	$404	1,001	840	851	0.19	0.17	0.17
Business Smart Thermostat w DLC	$49	$62	$82	446	595	893	0.51	0.67	0.80
Demand Response Incentive	$34	$47	$70	-	-	-	4.80	10.68	21.10
Total Residential	$5,948	$6,996	$8,374	28,495	20,781	21,365	29.61	40.94	52.44
Total Business	**$3,961**	**$4,018**	**$4,097**	**20,216**	**21,056**	**21,544**	9.01	15.17	25.76
Total Portfolio	**$9,909**	**$11,015**	**$12,472**	**48,711**	**41,838**	**42,909**	**38.62**	**56.12**	**78.20**

Table 2-9 RAP Program Potential Summary – GMO-MPS

Program	Total Budget (000s)			Net Incremental Energy Savings (MWh)			Net Incremental Peak Demand Savings (MW)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Home Lighting Rebate	$982	$728	$697	11,649	4,162	4,010	1.04	0.37	0.36
Home Energy Report	$552	$552	$552	12,574	12,574	12,574	5.79	5.79	5.79
Income-Eligible Home Energy Report	$189	$189	$189	3,636	3,636	3,636	1.71	1.71	1.71
Online Home Energy Audit	$84	$84	$84	-	-	-	-	-	-
Whole House Efficiency	$2,174	$2,187	$2,200	6,650	5,757	5,795	1.71	1.64	1.65
Income-Eligible Multi-Family	$327	$327	$327	507	418	418	0.10	0.09	0.09
Income-Eligible Weatherization	$689	$709	$709	1,232	1,007	1,023	0.04	0.02	0.02
Residential Smart Thermostat w DLC	$1,428	$1,933	$2,832	1,098	1,392	2,108	18.14	24.21	29.07
Central AC DLC Switch	$765	$1,219	$1,489	-	-	-	2.70	6.98	11.90
Water Heating DLC Switch	$457	$731	$875	-	-	-	0.58	1.51	2.55
Business Energy Efficiency Rebate - Standard	$1,188	$1,194	$1,199	6,763	7,153	7,184	1.08	1.13	1.13
Business Energy Efficiency Rebate - Custom	$782	$786	$790	3,561	3,580	3,598	0.92	0.92	0.93
Strategic Energy Management	$178	$178	$178	1,029	1,029	1,029	0.21	0.21	0.21
Retrocommissioning	$258	$258	$258	1,394	1,394	1,394	0.28	0.28	0.28
Block Bidding	$345	$345	$345	2,515	2,515	2,515	0.44	0.44	0.44
Online Business Energy Audit	$21	$21	$21	-	-	-	-	-	-
Small Business Targeted	$188	$188	$188	522	368	369	0.10	0.07	0.07
Business Smart Thermostat w DLC	$49	$61	$86	446	595	967	0.52	0.68	0.82
Demand Response Incentive	$140	$140	$140	-	-	-	35.58	35.63	35.68
Total Residential	$7,646	$8,660	$9,955	37,346	28,945	29,565	31.80	42.32	53.14
Total Business	$3,147	$3,171	$3,204	16,231	16,634	17,056	39.11	39.35	39.55
Total Portfolio	**$10,794**	**$11,830**	**$13,158**	**53,576**	**45,579**	**46,621**	**70.91**	**81.67**	**92.69**

Table 2-10 RAP Program Potential Summary – GMO-SJLP

Program	Total Budget (000s)			Net Incremental Energy Savings (MWh)			Net Peak Incremental Demand Savings (MW)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Home Lighting Rebate	$211	$157	$151	2,496	877	844	0.22	0.08	0.08
Home Energy Report	$113	$113	$113	2,567	2,567	2,567	1.18	1.18	1.18
Income-Eligible Home Energy Report	$58	$58	$58	1,127	1,127	1,127	0.53	0.53	0.53
Online Home Energy Audit	$84	$84	$84	-	-	-	-	-	-
Whole House Efficiency	$512	$513	$513	1,572	1,331	1,334	0.42	0.40	0.40
Income-Eligible Multi-Family	$156	$156	$156	190	151	151	0.03	0.03	0.03
Income-Eligible Weatherization	$256	$256	$256	425	344	351	0.02	0.01	0.01
Residential Smart Thermostat w DLC	$381	$570	$834	325	438	636	2.43	4.60	6.38
Central AC DLC Switch	$179	$286	$344	-	-	-	0.63	1.64	2.78
Water Heating DLC Switch	$199	$320	$389	-	-	-	0.26	0.66	1.13
Business Energy Efficiency Rebate - Standard	$392	$393	$394	2,183	2,279	2,292	0.36	0.37	0.37
Business Energy Efficiency Rebate - Custom	$264	$266	$267	1,239	1,245	1,251	0.32	0.32	0.32
Strategic Energy Management	$96	$96	$96	588	588	588	0.12	0.12	0.12
Retrocommissioning	$95	$95	$95	525	525	525	0.11	0.11	0.11
Block Bidding	$220	$220	$220	1,257	1,257	1,257	0.22	0.22	0.22
Online Business Energy Audit	$21	$21	$21	-	-	-	-	-	-
Small Business Targeted	$121	$121	$121	328	248	249	0.06	0.05	0.05
Business Smart Thermostat w DLC	$13	$20	$25	149	223	298	0.06	0.13	0.18
Demand Response Incentive	$25	$25	$25	-	-	-	19.07	19.14	19.14
Total Residential	$2,149	$2,513	$2,897	8,701	6,834	7,011	5.73	9.13	12.50
Total Business	$1,247	$1,256	$1,264	6,269	6,365	6,459	20.31	20.45	20.51
Total Portfolio	**$3,396**	**$3,769**	**$4,161**	**14,970**	**13,199**	**13,470**	**26.03**	**29.58**	**33.01**

Given the budgets and impacts for the program potential presented above, AEG performed the Total Resource Cost test (TRC) in order to gauge the economic merits of the portfolio. The cost-effectiveness analysis was conducted with AEG's BenCost software at the program and portfolio levels. The resulting benefits and costs of the DSM initiatives are all defined in terms of net present value of future cash flows. For the TRC test, the benefits are defined as the lifetime avoided energy costs and avoided capacity costs. The costs in this test are the incremental measure costs plus all administrative costs spent by the program administrator.

The cost-effectiveness results for the KCP&L RAP program potential are shown below in Table 2-11. The 3-year TRC ratio for the portfolio is 1.97, while a 20-year projected TRC ratio is 2.08. The levelized cost of energy saved is $0.036/kWh and the corresponding levelized cost of demand saved is $71/kW, both of which consider the long-term time period of 2019-2037. For cost of first-year savings, energy is $0.27/kWh and demand is $133/kW, both for the near-term period of 2019-2021. These costs are total utility program costs, i.e. incentives and administrative costs, with no allocation between energy and demand savings.

Several programs have better economics in 2019 than the following years due to the changing efficiency baseline standards for lighting in 2020, but average TRC ratios are well above 1.0 for all programs in the first 3 years as well as in the full study timespan. The only exception to this is Income-Eligible Multi-Family and Income-Eligible Weatherization, but this is acceptable since income-eligible programs are not required to be cost-effective as long as the portfolio as a whole is still cost-effective.[3]

Table 2-11 RAP Program Potential Cost Effectiveness – All Service Territories

	3-Year TRC Ratio (2019-2021)	19-Year TRC Ratio (2019-2037)	Levelized UCT $/kWh (2019-2037)	Levelized UCT $/kW (2019-2037)	First-Year UCT $/kWh (2019-2021)	First-Year UCT $/kW (2019-2021)
Home Lighting Rebate	3.21	3.39	$0.012	$139	$0.12	$1,385
Home Energy Report	2.18	2.26	$0.041	$88	$0.04	$96
Income-Eligible Home Energy Report	1.90	1.97	$0.047	$100	$0.05	$109
Whole House Efficiency	1.08	1.11	$0.030	$109	$0.36	$1,270
Income-Eligible Multi-Family	0.61	0.61	$0.095	$533	$0.96	$5,328
Income-Eligible Weatherization	0.99	1.01	$0.045	$2,264	$0.69	$20,206
Residential Smart Thermostat w DLC	1.26	2.18	$0.201	$66	$1.28	$133
Central AC DLC Switch	3.78	2.94	n/a	$51	n/a	$292
Water Heating DLC Switch	1.37	1.11	n/a	$131	n/a	$804
Business Energy Eff Rebate - Standard	1.74	2.11	$0.015	$94	$0.17	$1,076
Business Energy Eff Rebate - Custom	1.31	1.46	$0.023	$88	$0.21	$828
Strategic Energy Management	1.30	1.42	$0.049	$247	$0.16	$812
Retrocommissioning	1.16	1.30	$0.056	$279	$0.18	$903
Block Bidding	1.72	1.88	$0.020	$116	$0.18	$1,011
Small Business Targeted	1.32	1.37	$0.041	$209	$0.44	$2,298
Business Smart Thermostat w DLC	5.04	5.66	$0.014	$70	$0.09	$159
Demand Response Incentive	227.68	217.25	n/a	$1	n/a	$1
Residential Total:	1.60	1.90	$0.057	$103	$0.34	$313
Business Total:	2.68	2.77	$0.022	$46	$0.20	$61
Portfolio Total:	**1.97**	**2.08**	**$0.036**	**$71**	**$0.27**	**$133**

[3] Note that cost-effectiveness of demand response programs has been modeled using a 10-year program lifetime based on lifetime of equipment, with annual or 1-year accounting used to track participation and incentive payments.

3

DETAILED PROGRAM DESCRIPTIONS

This chapter provides detail on key elements of each program in the portfolio. Program data presented is specifically for the RAP scenario. Years highlighted are the nearest program implementation cycle of 2019-2021, as well as 2030 and the final year of the study, 2037. Data for all years and all scenarios are available in the BenCost program potential model that has been provided to KCP&L.

HOME LIGHTING REBATE

Description	The Home Lighting Rebate Program incentivizes the purchase and installation of efficient lighting utilizing an upstream strategy to provide customers incentives on qualifying LED light bulbs at participating retailers. Customers receive an instant incentive at the point-of-purchase. The incentives vary depending upon the type of light bulb, manufacturer and associated retail cost.
Objectives	Increase the penetration of efficient lighting in customer homes by incentivizing the purchase of ENERGY STAR® qualified LEDs.
Target Market	Residential customers as well as lighting manufacturers and local retailers.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to efficiently obtain the energy savings goals while adhering to the budget. The implementation contractor will: • Establish relationships with lighting manufacturers and retailers throughout KCP&L's service territory. • Provide in-store promotional materials and retail sales staff training. • Track program performance, including tracking sales data, reviewing sales data for accuracy and payment to retailers. • Periodically report progress towards program goals and opportunities for improvement. KCP&L will work with the implementation contractor to market the program to customers and educate retailer sales staff. Marketing efforts to increase customer awareness may include, but not be limited to bill inserts, newspaper advertisements, internet placement, and Point-of-Purchase materials (hang tags, posters). The Home Lighting Rebate Program will be cross-marketed with KCP&L's other Residential DSM programs and be used to increase awareness of KCP&L DSM rebates.
Risk Management	Upstream programs simplify the participation process for residential customers, eliminating the need to complete and submit a rebate application. However, upstream programs typically have higher free ridership and leakage outside of the service territory. A number of steps will be taken to reduce free ridership and leakage while increasing spillover, including: • KCP&L will work with the implementation contractor to select retailers located well within the service territory to reduce leakage outside of the service territory. • The program will be cross-marketed with KCP&L's other Residential DSM programs (e.g. bill inserts will promote multiple programs). • Incentives will be modified as needed to respond to the market price of qualifying light bulbs, with a goal of the incentive being no higher than 50% of the incremental cost. • KCP&L will work with the implementation contractor and third party evaluator to understand any market transformation elements that arise from this upstream program. Another potential risk management issue is the onset of the federal lighting standard starting January 1, 2020, which will raise the minimum efficacy requirements of general service screw-in lamps from approximately 17 lumens per watt to 45 lumens per watt. This will change savings per lamp and change program cost-effectiveness. AEG and KCP&L have included projections that

	account for these changes, appropriately adjust incentives, and maintain cost effectiveness, but program staff will monitor market data and make adjustments as appropriate.
Measures	The measures may be modified to reflect market conditions. Eligible measures include standard LEDs and specialty LEDs.
Projected Energy & Demand Savings Target	A NTG ratio of 100% was applied to the energy and demand savings. Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	9,985	3,508	3,378	2,691	2,691
KCP&L-KS	11,674	4,170	3,983	3,852	4,239
GMO-SJLP	2,496	877	844	673	673
GMO-MPS	11,649	4,162	4,010	3,215	3,215
KCP&L Total	35,804	12,716	12,215	10,431	10,817

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.89	0.31	0.30	0.24	0.24
KCP&L-KS	1.04	0.37	0.35	0.34	0.38
GMO-SJLP	0.22	0.08	0.08	0.06	0.06
GMO-MPS	1.04	0.37	0.36	0.29	0.29
KCP&L Total	3.18	1.13	1.09	0.93	0.96

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$849,555	$633,554	$606,551	$394,858	$394,858
KCP&L-KS	$984,858	$722,287	$681,962	$552,866	$612,347
GMO-SJLP	$211,339	$157,339	$150,604	$97,664	$97,664
GMO-MPS	$982,223	$728,472	$697,188	$452,167	$452,167
KCP&L Total	$3,027,975	$2,241,652	$2,136,305	$1,497,555	$1,557,036

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	3.57	2.69	2.78	4.00	4.11
KCP&L-KS	3.60	2.82	2.93	4.07	4.14
GMO-SJLP	3.59	2.72	2.80	4.05	4.16
GMO-MPS	3.59	2.79	2.88	4.18	4.30
KCP&L Total	3.59	2.77	2.86	4.09	4.18

HOME ENERGY REPORT

Description	The Home Energy Report Program provides individualized energy use information to customers while simultaneously offering recommendations on how to save energy and money by making small changes to energy consuming behaviors. Energy reports are sent periodically to customer households to give them self-awareness and a peer comparison of their energy usage. Customers are also provided access to an online tool to track energy consumption and receive tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.
Objectives	Reduce consumption via socially- and information-driven behavioral change and raise general awareness of energy efficiency and KCP&L's DSM programs.
Target Market	Residential single family homes.
Implementation Strategy	KCP&L will select an implementation contractor that specializes in developing and issuing residential energy reports. The implementation contractor will utilize experimental design to select report recipients and a control group, design the reports and develop customized energy reduction tips with input from KCP&L. The program will cross-promote and market the KCP&L DSM portfolio.
Risk Management	Potential issues/risks to be aware of: • The program may undergo a meaningful change in customer responsiveness and evaluation paradigms in the coming years. • Research is being conducted on the persistence of savings after the program has ended. The program has been assumed to have a one year measure life and therefore has a relatively high-cost of energy savings on a lifetime or levelized cost basis. • Customer attrition may reduce the potential achievable program savings. The implementation contractor may account for customer attrition by adding new customers each year during designated periods. The program provides a significant opportunity to promote KCP&L's Residential DSM programs via the customer reports and online tool, thereby resulting in increased program spillover. However, the spillover impact will need to be carefully determined through an impact evaluation.
Measures	Customers receive personalized energy reports, but there is no monetary incentive.
Projected Energy & Demand Savings Target	A NTG ratio of 100% was applied to the energy and demand savings. Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	9,579	9,579	9,579	9,579	9,579
KCP&L-KS	10,046	10,046	10,046	10,046	10,046
GMO-SJLP	2,567	2,567	2,567	2,567	2,567
GMO-MPS	12,574	12,574	12,574	12,574	12,574
KCP&L Total	34,766	34,766	34,766	34,766	34,766

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	4.42	4.42	4.42	4.42	4.42
KCP&L-KS	4.57	4.57	4.57	4.57	4.57
GMO-SJLP	1.18	1.18	1.18	1.18	1.18
GMO-MPS	5.79	5.79	5.79	5.79	5.79
KCP&L Total	15.96	15.96	15.96	15.96	15.96

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$401,646	$401,646	$401,646	$401,646	$401,646
KCP&L-KS	$376,980	$376,980	$376,980	$376,980	$376,980
GMO-SJLP	$113,327	$113,327	$113,327	$113,327	$113,327
GMO-MPS	$551,765	$551,765	$551,765	$551,765	$551,765
KCP&L Total	$1,443,718	$1,443,718	$1,443,718	$1,443,718	$1,443,718

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	2.25	2.30	2.32	2.63	2.81
KCP&L-KS	2.50	2.56	2.58	2.93	3.13
GMO-SJLP	2.14	2.19	2.21	2.51	2.68
GMO-MPS	2.16	2.20	2.23	2.53	2.70
KCP&L Total	2.27	2.32	2.35	2.66	2.84

INCOME-ELIGIBLE HOME ENERGY REPORT

Description	The Income Eligible Home Energy Report Program provides individualized energy use information to income-eligible customers while simultaneously offering recommendations on how to save energy and money by making small changes to energy consuming behaviors. Energy reports are sent periodically to customer households to give them self-awareness and a peer comparison of their energy usage. Customers are also provided access to an online tool to track energy consumption and offer tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.
Objectives	Reduce consumption via socially- and information-driven behavioral change and raise general awareness of energy efficiency and KCP&L's DSM programs.
Target Market	Income-eligible residential homeowners and renters that are below 200% of the Federal poverty level.
Implementation Strategy	KCP&L will select an implementation contractor that specializes in developing and issuing residential energy reports. The implementation contractor will utilize experimental design to select report recipients and a control group, design the reports and develop customized energy reduction tips with input from KCP&L. The program will cross-promote and market the KCP&L DSM portfolio.
Risk Management	Potential issues/risks to be aware of: • The program may undergo a meaningful change in customer responsiveness and evaluation paradigms in the coming years. • Research is being conducted on the persistence of savings after the program has ended. The program has been assumed to have a one year measure life and therefore has a relatively high-cost of energy savings on a lifetime or levelized cost basis. • Customer attrition may reduce the potential achievable program savings. The implementation contractor may account for customer attrition by adding new customers each year during designated periods. The program provides a significant opportunity to promote KCP&L's Residential DSM programs via the customer reports and online tool, thereby resulting in increased program spillover. However, the spillover impact will need to be carefully determined through an impact evaluation.
Measures	Customers receive personalized energy reports, but there is no monetary incentive.
Projected Energy & Demand Savings Target	A NTG ratio of 100% was applied to the energy and demand savings. Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	2,928	2,928	2,928	2,928	2,928
KCP&L-KS	1,409	1,409	1,409	1,409	1,409
GMO-SJLP	1,127	1,127	1,127	1,127	1,127
GMO-MPS	3,636	3,636	3,636	3,636	3,636
KCP&L Total	9,100	9,100	9,100	9,100	9,100

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1.37	1.37	1.37	1.37	1.37
KCP&L-KS	0.65	0.65	0.65	0.65	0.65
GMO-SJLP	0.53	0.53	0.53	0.53	0.53
GMO-MPS	1.71	1.71	1.71	1.71	1.71
KCP&L Total	4.26	4.26	4.26	4.26	4.26

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$147,546	$147,546	$147,546	$147,546	$147,546
KCP&L-KS	$68,056	$68,056	$68,056	$68,056	$68,056
GMO-SJLP	$57,624	$57,624	$57,624	$57,624	$57,624
GMO-MPS	$188,622	$188,622	$188,622	$188,622	$188,622
KCP&L Total	$461,848	$461,848	$461,848	$461,848	$461,848

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.89	1.92	1.95	2.20	2.35
KCP&L-KS	1.97	2.01	2.03	2.30	2.45
GMO-SJLP	1.87	1.91	1.93	2.18	2.33
GMO-MPS	1.85	1.89	1.91	2.16	2.31
KCP&L Total	1.88	1.92	1.94	2.20	2.35

ONLINE HOME ENERGY AUDIT

Description	The program provides customers access to a free online tool to analyze the energy efficiency of their home, educational materials regarding energy efficiency and conservation, and information on KCP&L DSM programs.
Objectives	Encourage energy education and conservation, as well as further engagement in the broader portfolio of DSM programs. The program goals include: • Increase awareness of household energy consumption. • Educate residential customers about the benefits of energy efficiency and the opportunities to reduce energy consumption. • Increase awareness of and participation in other KCP&L DSM programs.
Target Market	Residential customers.
Implementation Strategy	KCP&L will engage a third-party contractor to develop and maintain the online tool(s).
Risk Management	The Online Home Energy Audit Program is an educational program that informs customers of household energy consumption and methods to reduce energy usage. KCP&L will strategize ways to highlight the audit tool on the KCP&L website and increase customer engagement.
Measures	There are no monetary incentives.
Projected Energy & Demand Savings Target	Program savings were not estimated for this program since it is deemed an educational program.
Estimated Program Budget	Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$84,001	$84,001	$84,001	$84,001	$84,001
KCP&L-KS	$84,001	$84,001	$84,001	$84,001	$84,001
GMO-SJLP	$84,001	$84,001	$84,001	$84,001	$84,001
GMO-MPS	$84,001	$84,001	$84,001	$84,001	$84,001
KCP&L Total	$336,004	$336,004	$336,004	$336,004	$336,004

Cost-Effectiveness	n/a

WHOLE HOUSE EFFICIENCY

Description

The Whole House Efficiency Program is a holistic program that aims at increasing efficiency across multiple systems in a customer's home, with measures that affect all end uses and building shell. It consists of 3 optional tiers:

Home Energy Assessment. The customer receives an in-home energy assessment and direct installation of low-cost measures. The assessment will identify potential efficiency improvements. The low-cost measures to be installed include: low-flow faucet aerator, low-flow showerhead, advanced power strip, water heater tank wrap, hot water pipe insulation, furnace filter whistle and LEDs.

Weatherization. Customers are eligible to receive incentives for the purchase and installation of air sealing, duct repair and sealing, and insulation (ceiling, wall, radiant barrier).

Equipment Rebates. Customers are eligible to receive incentives for qualifying HVAC equipment installed by a participating contractor. Qualifying measures include heat pump water heaters, heat pump ductless mini splits, central air conditioners and heat pumps. Early retirement incentives are provided for central air conditioners and/or heat pumps in operable condition and at least 5 years of age.

Customers that install items from multiple tiers will be provided a bonus incentive per the chart.

Requirements	Bonus Incentive
Weatherization & Equipment measure	$225
Assessment + Weatherization measure + Equipment measure	$300

Residential customers that rent a residence must receive the written approval of the homeowner/landlord to participate in the program.

Objectives

Encourage whole-house improvements to existing homes by promoting home energy assessments and comprehensive retrofit services. This includes:

- Encourage energy saving behavior and whole house improvements.
- Help residential customers reduce their electricity bills.
- Educate customers about the benefits of installing high efficiency equipment.
- Develop partnerships with contractors to bring efficient systems to market.

Target Market

Residential customers that own/rent a residence or are building a new residence as well as HVAC contractors for trade ally participation.

Implementation Strategy

KCP&L will engage a third-party implementation contractor to efficiently obtain the savings goals while adhering to the budget. The implementation contractor will:

- Hire/sub-contract local staff to perform home assessments and direct measure installation.
- Engage customers and schedule home assessment appointments.
- Provide customer service and trade ally support.
- Establish relationships with local contractors to work with the program installing energy efficient equipment and infiltration measures.
- Process rebate applications, including review and verification of applications and payment of customer rebates.
- Track program performance, including customer and contractor participation as well as quality assurance/quality control (QA/QC).
- Periodically report progress towards program goals.

KCP&L will work with the implementation contractor to market the program to residential customers and contractors utilizing the following approaches:

- Direct outreach to customers, including bill inserts, newspaper advertisements, email blasts, direct mail, bill messaging, and community events.
- Engage contractors to promote the program and use rebates to help sell qualifying equipment.
- Cross-market with KCP&L's other Residential DSM programs.

Risk Management

It is important that the measures are properly installed and customer satisfaction is high. Therefore, it is crucial to engage experienced contractors. It is recommended that contractors provide KCP&L with proof of insurance on an annual basis. KCP&L and/or the implementation contractor should conduct QA/QC of a random group of completed projects by project type and contractor. The QA/QC process should include verification of the equipment installed and customer satisfaction with the contractor and the program. KCP&L and/or the implementation contractor should work with the contractors to correct any QA/QC findings. If QA/QC issues persist, the contractor may be removed from the program.

A number of steps will be taken to reduce free ridership and increase spillover, including:

- Incentives will be modified as needed to respond to the market price of qualifying measures, with a goal of the incentive being no higher than 50% of the incremental cost.
- KCP&L will work with the implementation contractor to properly set the rebate levels to ensure customers have adequate buy-in to the program.
- Cross-market the program with KCP&L's other Residential DSM programs.
- Encourage customers to participate in all three tiers.

Measures

The measures may be modified to reflect market conditions.

Kit Measures
Low-flow faucet aerator
Low-flow showerhead
Advanced power strip
Water heater tank wrap
Hot water pipe insulation
LED lamps
Furnace filter whistle

Weatherization Measures
Air Sealing
Ceiling Insulation, R-38
Wall Insulation, R-5
Radiant Barrier Insulation
Duct Repair and Sealing

Equipment Rebate Measures	Replace/ New	Early Retirement Option	Distinct option for Replacing Electric Resistance Heat
Heat Pump Water Heater	X	n/a	n/a
Heat Pump Ductless Mini-Split	X	n/a	n/a
SEER ≥15 Central Air Conditioner	X	X	n/a
SEER ≥16 Central Air Conditioner	X	X	n/a
SEER ≥17 Central Air Conditioner	X	X	n/a
SEER ≥15, HSPF ≥8.5 Heat Pump	X	X	X
SEER ≥16, HSPF ≥8.5 Heat Pump	X	X	X
SEER ≥17, HSPF ≥8.6 Heat Pump	X	X	X

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	4,361	3,575	3,599	4,829	8,778
KCP&L-KS	3,393	3,003	3,052	4,846	15,519
GMO-SJLP	1,572	1,331	1,334	1,747	3,170
GMO-MPS	6,650	5,757	5,795	7,778	14,131
KCP&L Total	15,975	13,666	13,781	19,201	41,599

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.98	0.91	0.92	1.22	2.21
KCP&L-KS	0.83	0.81	0.83	1.35	4.32
GMO-SJLP	0.42	0.40	0.40	0.51	0.93
GMO-MPS	1.71	1.64	1.65	2.20	4.00
KCP&L Total	3.93	3.75	3.80	5.28	11.47

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$1,361,352	$1,370,372	$1,378,740	$1,816,145	$3,287,044
KCP&L-KS	$1,055,652	$1,074,408	$1,091,108	$1,705,051	$5,424,371
GMO-SJLP	$511,861	$512,549	$513,237	$660,264	$1,195,863
GMO-MPS	$2,174,372	$2,187,449	$2,200,454	$2,908,798	$5,274,299
KCP&L Total	$5,103,237	$5,144,778	$5,183,539	$7,090,258	$15,181,577

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.17	1.01	1.03	1.16	1.19
KCP&L-KS	1.10	1.01	1.02	1.15	1.17
GMO-SJLP	1.15	1.03	1.05	1.18	1.20
GMO-MPS	1.09	1.00	1.01	1.13	1.16
KCP&L Total	1.12	1.01	1.02	1.15	1.17

INCOME-ELIGIBLE MULTI-FAMILY

Description	The program aims to provide direct install measures in housing units and common area measures to multi-family buildings. This includes the following characteristics: ***Multi-Family Kits.*** Direct installation of low-cost measures for income-eligible homeowners and renters in multi-family housing, at no cost to the participant. The low-cost measures to be installed include: low-flow faucet aerator, low-flow showerhead, advanced power strip, water heater tank wrap, hot water pipe insulation and LEDs. ***Multi-Family Common Areas.*** Installation of prescriptive lighting measures in multi-family common areas, at no cost to the participating building owner, and custom measure rebates at $/kWh saved.
Objectives	Deliver long-term energy savings and bill reductions to income-eligible customers in multi-family housing and multi-family common area energy savings.
Target Market	Income-eligible residential homeowners and renters that are below 200% of the Federal poverty level and reside in multi-family housing as well as multi-family buildings with income-eligible residents.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Identify and establish relationships with multi-family building owners that have a number of income-eligible residents. • Engage customers and schedule appointments. • Track program performance. • Periodically report progress towards program goals. KCP&L will work with the implementation contractor to market the program to income-eligible customers and multi-family building owners utilizing the following approaches: • Direct outreach to customers, including bill inserts, direct mail, bill messaging, community events and community organizations. • Engage building owners to promote awareness of and use of the program. The implementation contractor framework could include providing owners of multi-family buildings with a single point of contact or Coordinator for in-unit and common area/building system measures. The Coordinator's duties could include: • Determining eligibility and ensuring eligible customers are aware of the available incentives from all utilities. • Assisting in the application process for the residential and business improvements. In addition, where other utilities are participating, assisting with those applications. • Providing a seamless point of contact for navigating the various incentive offers provided by the Company and other utilities. • Maintaining a relationship with the existing business trade ally network and providing information and guidance to assist them with the bid process for installation work. • Understanding and maintaining a network of assistance agencies and making referrals for financing and repairs, seeking to remove barriers to participation. • Providing case studies and education, and working with business development teams to ensure proper outreach is occurring. • Coordinating marketing materials to provide an easy to understand process for participation. • Maintaining working relationships with and providing outreach and education to stakeholders such as lenders, government agencies, and other identified parties. The program targets an underserved market that may not participate in other DSM programs due to a lack of funds or awareness. The program will encourage building managers and owners to continue improving building energy efficiency via the Business DSM Programs.
Risk Management	The program focuses on providing energy efficiency services to income-eligible residents to ensure reduced consumption. There is little risk associated with this product.
Measures	The multi-family unit kits and common area lighting measures are installed free of charge. The kits include: low-flow faucet aerator, low-flow showerhead, advanced power strip, water heater tank wrap, hot water pipe insulation and LEDs.

	Custom common area incentives at a $/kWh saved.
Projected Energy & Demand Savings Target	A NTG ratio of 100% was applied to the energy and demand savings. Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	776	641	641	850	1,545
KCP&L-KS	448	375	375	572	1,832
GMO-SJLP	190	151	151	197	357
GMO-MPS	507	418	418	551	999
KCP&L Total	1,921	1,585	1,585	2,170	4,733

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.15	0.14	0.14	0.19	0.34
KCP&L-KS	0.09	0.08	0.08	0.12	0.40
GMO-SJLP	0.03	0.03	0.03	0.04	0.07
GMO-MPS	0.10	0.09	0.09	0.12	0.21
KCP&L Total	0.37	0.34	0.34	0.47	1.01

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$493,612	$493,612	$493,612	$654,065	$1,215,580
KCP&L-KS	$367,307	$367,307	$367,307	$522,124	$1,647,727
GMO-SJLP	$156,298	$156,298	$156,298	$167,700	$325,500
GMO-MPS	$326,955	$326,955	$326,955	$413,492	$746,145
KCP&L Total	$1,344,172	$1,344,172	$1,344,172	$1,757,381	$3,934,952

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	0.88	0.75	0.76	0.88	0.88
KCP&L-KS	0.71	0.61	0.62	0.76	0.79
GMO-SJLP	0.70	0.56	0.57	0.79	0.76
GMO-MPS	0.87	0.73	0.74	0.89	0.92
KCP&L Total	0.81	0.68	0.70	0.84	0.84

INCOME-ELIGIBLE WEATHERIZATION

Description	The program leverages the Weatherization Assistance Program to provide qualifying customers with approved energy efficiency measures and equipment.
Objectives	Deliver long-term energy savings and bill reductions to income-eligible customers.
Target Market	Income-eligible residential homeowners and renters that are below 200% of the Federal poverty level.
Implementation Strategy	KCP&L will work with local Weatherization Assistance Program agencies to implement the program. The agencies will utilize the KCP&L funding to provide weatherization to additional homes and will be responsible for the following activities: • Market the program and engage customers. • Schedule appointments. • Install measures. • Track program performance. • Periodically report progress towards program goals. The program targets an underserved market that may not participate in other DSM programs due a lack of funds.
Risk Management	The program focuses on providing energy efficiency services to income-eligible residents to ensure reduced consumption. There is little risk associated with this product.
Measures	Measures include those that are approved through the Weatherization Assistance Program, including, but not limited to:

Eligible Measures
LED Bulbs
Ceiling Insulation
Duct Insulation
Wall Insulation
Duct Repair and Sealing
Foundation Insulation
Air Sealing
Water Heater Pipe Insulation
Heat Pump Maintenance and Tune-Up
SEER ≥15, HSPF ≥8.5 Heat Pump
SEER ≥15, HSPF ≥8.5 Heat Pump Early Retirement

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1,031	847	874	1,236	2,254
KCP&L-KS	348	268	273	445	1,430
GMO-SJLP	425	344	351	495	907
GMO-MPS	1,232	1,007	1,023	1,427	2,602
KCP&L Total	3,037	2,465	2,521	3,604	7,194

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.04	0.02	0.02	0.03	0.05
KCP&L-KS	0.02	0.01	0.01	0.01	0.04
GMO-SJLP	0.02	0.01	0.01	0.01	0.03
GMO-MPS	0.04	0.02	0.02	0.03	0.06
KCP&L Total	0.12	0.06	0.06	0.09	0.17

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$570,938	$570,938	$590,625	$767,813	$1,397,813
KCP&L-KS	$236,250	$236,250	$236,250	$374,063	$1,181,250
GMO-SJLP	$255,938	$255,938	$255,938	$334,688	$610,313
GMO-MPS	$689,063	$708,750	$708,750	$925,313	$1,673,438
KCP&L Total	$1,752,189	$1,771,876	$1,791,563	$2,401,877	$4,862,814

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.19	1.02	1.03	1.29	1.32
KCP&L-KS	0.94	0.75	0.78	0.92	0.96
GMO-SJLP	1.09	0.91	0.95	1.18	1.21
GMO-MPS	1.16	0.96	0.99	1.22	1.26
KCP&L Total	1.13	0.94	0.97	1.19	1.20

RESIDENTIAL SMART THERMOSTAT WITH DIRECT LOAD CONTROL

Description	The Residential Smart Thermostat with Direct Load Control (DLC) Program pays an incentive to participants to reduce peak demand by controlling their cooling equipment during periods of system peak demand and when there may be delivery constraints within certain load zones. This is done by way of a remotely communicating, programmable thermostat. During a program event, the program operations center sends a signal to the thermostat to adjust its set-point by a few degrees such that the system will consume less energy and run less frequently throughout the max 4-hour event duration. One method of participation will be for customers to receive the thermostat and professional installation for free upon qualification and enrollment in the program. Smart thermostats also achieve energy savings by using occupancy sensors and setback schedules with learning algorithms.
Objectives	Primarily decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours. Also provide annual energy savings.
Target Market	Individually metered residential customers. Target primarily single family homeowners, expanding into multi-family as the single family market opportunities begin to saturate.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Hire/sub-contract local staff to install the programmable thermostats. • Engage customers, schedule installation appointments and process customer incentives. • Provide customer service support. • Track program performance and event data. • Periodically report progress towards program goals and opportunities for improvement. Events will typically occur between June 1 and September 30, Monday to Friday. Event duration is max 4 hours per day for a maximum of 15 events per year. Customers may opt out of any event. The program will be marketed through direct contact with consumers using bill inserts, newsletters, website, broadcast and print media, and direct mail. The program will be cross marketed with KCP&L's Residential DSM programs. In particular, it will be marketed and positioned to customers as a seamless bundle with other demand response programs that are similar in delivery mechanism and nature.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO (regional transmission organization), thereby reducing the utility system peak, required capacity, and the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Having the thermostats available as a resource year-round is potentially of value to system operations in the event of plant maintenance or other grid events. Curtailment in participating homes with electric heat could provide additional risk management capabilities during winter months in the future. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants.
Measures	Customers receive a free communicating, programmable thermostat with installation as well as a modest, annual incentive payments in future years to retain their engagement and participation.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1,161	1,472	2,227	1,631	1,710
KCP&L-KS	1,177	1,511	2,227	1,631	1,750
GMO-SJLP	325	438	636	318	358
GMO-MPS	1,098	1,392	2,108	1,551	1,631
KCP&L Total	3,761	4,813	7,199	5,131	5,449

Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective.

Projected Net Incremental Program Savings

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	19.99	26.33	31.39	54.18	52.29
KCP&L-KS	19.01	25.63	30.78	54.43	52.79
GMO-SJLP	2.43	4.60	6.38	12.47	10.84
GMO-MPS	18.14	24.21	29.07	51.16	49.39
KCP&L Total	59.57	80.77	97.62	172.24	165.31

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$1,521,463	$2,052,631	$2,999,233	$3,144,626	$3,163,526
KCP&L-KS	$1,524,678	$2,089,210	$2,998,158	$3,172,296	$3,240,546
GMO-SJLP	$381,020	$569,682	$833,523	$709,166	$695,516
GMO-MPS	$1,427,606	$1,933,111	$2,832,349	$2,995,130	$3,018,230
KCP&L Total	$4,854,767	$6,644,634	$9,663,263	$10,021,218	$10,117,818

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.89	1.93	1.83	2.54	2.94
KCP&L-KS	1.82	1.86	1.79	2.54	2.95
GMO-SJLP	1.09	1.26	1.30	2.53	3.04
GMO-MPS	1.85	1.90	1.80	2.55	2.95
KCP&L Total	1.79	1.84	1.76	2.54	2.95

Residential Central Air Conditioner Direct Load Control Switch

Description	The Residential Central Air Conditioner Direct Load Control (DLC) Switch Program pays an incentive to participants to reduce peak demand by controlling their cooling equipment during periods of system peak demand and when there may be delivery constraints within certain load zones. This is done by way of a remotely communicating switch installed on the exterior, condensing unit of the central air conditioner. During a program event, the program operations center sends a radio frequency signal to the switch to cycle the central air conditioner such that the system will consume less energy and run less frequently throughout the event duration. The compressor in the condensing unit is shut down up to 50% of the time in distinct cycles during an event while the operation of the fan unit is not impacted. This allows cool air to be circulated throughout the home while the compressor is disabled. The operation of the switch is usually controlled through a digital paging network.
Objectives	Decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours.
Target Market	Individually metered residential customers. Target primarily single family homeowners, expanding into multi-family as the single family market opportunities begin to saturate.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Hire/sub-contract local staff to install the switches. • Engage customers, schedule installation appointments and process customer incentives. • Provide customer service support. • Track program performance and event data. • Periodically report progress towards program goals and opportunities for improvement. Events will typically occur between June 1 and September 30, Monday to Friday. Event duration is max 4 hours per day for a maximum of 15 events per year. Customers may opt out of any event. The program will be marketed through direct contact with consumers using bill inserts, newsletters, website, broadcast and print media, and direct mail. The program will be cross marketed with KCP&L's Residential DSM programs. In particular, it will be marketed and positioned to customers as a seamless bundle with other demand response programs that are similar in delivery mechanism and nature.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO (regional transmission organization), thereby reducing the utility system peak, required capacity, and the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants. Keeping track of switch equipment is an issue to consider and track closely since the switch can be either removed or left in place if a customer moves or is no longer enrolled in the product. If renters requested to participate, they are required to get landlord approval beforehand to prevent any installation conflicts over property and access.
Measures	A direct load control switch is installed on the condensing unit of the customer's central air conditioner.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the demand savings.

Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective.

Projected Net Incremental Program Savings

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	2.92	7.46	12.75	25.70	20.29
KCP&L-KS	2.87	7.40	12.70	25.45	20.16
GMO-SJLP	0.63	1.64	2.78	5.46	4.20
GMO-MPS	2.70	6.98	11.90	23.94	19.03
KCP&L Total	9.12	23.49	40.12	80.55	63.67

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$827,427	$1,292,872	$1,601,572	$1,198,761	$1,070,661
KCP&L-KS	$813,421	$1,291,883	$1,600,583	$1,192,889	$1,067,939
GMO-SJLP	$178,627	$286,363	$344,113	$251,965	$221,620
GMO-MPS	$764,917	$1,219,489	$1,489,339	$1,120,547	$1,006,097
KCP&L Total	$2,584,392	$4,090,607	$5,035,607	$3,764,162	$3,350,042

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	3.71	3.78	3.77	3.02	2.67
KCP&L-KS	3.72	3.79	3.78	3.03	2.68
GMO-SJLP	3.73	3.80	3.79	3.02	2.65
GMO-MPS	3.73	3.80	3.79	3.03	2.68
KCP&L Total	3.72	3.79	3.78	3.03	2.67

RESIDENTIAL WATER HEATING DIRECT LOAD CONTROL SWITCH

Description	The Residential Water Heating Direct Load Control (DLC) Switch Program pays an incentive to participants to reduce peak demand by controlling their electric water heating equipment during periods of system peak demand and when there may be delivery constraints within certain load zones. This is done by way of a remotely communicating switch installed on the water heater. During a program event, the program operations center sends a radio frequency signal to the switch to cycle the water heater such that the system will consume less energy and run less frequently throughout the event duration.
Objectives	Decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours.
Target Market	Individually metered residential customers with electric water heat. Target primarily single family homeowners, expanding into multi-family as the single family market opportunities begin to saturate.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Hire/sub-contract local staff to install the switches. • Engage customers, schedule installation appointments and process customer incentives. • Provide customer service support. • Track program performance and event data. • Periodically report progress towards program goals and opportunities for improvement. Events are essentially undetectable to participants if cycling time is provided to allow alternating homes in the program portfolio to recharge or reheat their hot water storage tanks. Individual tank recovery time is typically 1 to 2 hours. These traits allow events to occur any day of the year at any time. Events will typically be driven by and coincide with the summer system peak events targeted by KCP&L's other demand response programs, occurring for 4 hour blocks between June 1 and September 30, Monday to Friday; but other hours and schedules can be utilized if deemed valuable. Customers may opt-out twice a year. The program will be marketed through direct contact with consumers using bill inserts, newsletters, website, broadcast and print media, and direct mail. The program will be cross marketed with KCP&L's Residential DSM programs. In particular, it will be marketed and positioned to customers as a seamless bundle with other demand response programs that are similar in delivery mechanism and nature.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO (regional transmission organization), thereby reducing the utility system peak, required capacity, and the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants. Keeping track of switch equipment is an issue to consider and track closely since the switch can be either removed or left in place if a customer moves or is no longer enrolled in the product. If renters requested to participate, they are required to get landlord approval beforehand to prevent any installation conflicts over property and access. Additionally, installation cost and complexity is higher with water heating DLC since the installer must access the interior of the home and coordinate schedules with the participant. This is in contrast to the air conditioning DLC switch, which can be installed on the exterior condensing unit of the air conditioner without requiring home access.
Measures	A direct load control switch is installed on the customer's water heater.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the demand savings.

Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective.

Projected Net Incremental Program Savings

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.36	0.94	1.58	3.13	2.73
KCP&L-KS	0.55	1.42	2.46	5.22	4.29
GMO-SJLP	0.26	0.66	1.13	2.31	1.94
GMO-MPS	0.58	1.51	2.55	5.28	4.29
KCP&L Total	1.75	4.53	7.72	15.94	13.25

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$293,495	$456,834	$536,004	$362,880	$371,490
KCP&L-KS	$436,724	$685,929	$869,889	$616,350	$590,730
GMO-SJLP	$198,517	$320,177	$388,637	$277,116	$262,500
GMO-MPS	$456,939	$731,184	$875,244	$620,970	$590,730
KCP&L Total	$1,385,675	$2,194,124	$2,669,774	$1,877,316	$1,815,450

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.28	1.34	1.34	1.15	1.07
KCP&L-KS	1.32	1.36	1.36	1.16	1.07
GMO-SJLP	1.37	1.37	1.36	1.16	1.07
GMO-MPS	1.33	1.36	1.36	1.16	1.06
KCP&L Total	1.32	1.36	1.36	1.16	1.07

BUSINESS ENERGY EFFICIENCY REBATE - STANDARD

Description	The Business Energy Efficiency Rebate – Standard is a pre-qualified list of measures designed to help commercial and industrial customers save energy through a broad range of energy efficiency options that address all major end uses and processes. The program will offer standard rebates as well as mid-stream incentives. The measures incentivized, including lighting, HVAC equipment and motors, are proven technologies that are readily available with known performance characteristics. ***Standard Rebates:*** participants select energy efficient equipment from a pre-qualified list. Rebates are issued to participants upon completion of the project and submission of the rebate application. ***Mid-Stream Incentives:*** Trade Allies receive incentives for increasing the sale of qualifying measures. Measures that are incentivized mid-stream will not be offered as a standard rebate. Standard participant rebates per program year are limited to the annual cap outlined in the tariff and on the company website and applications.
Objectives	Encourage the purchase and installation of energy efficient equipment.
Target Market	All commercial and industrial customers as well as Trade Allies.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Process customer applications, verify eligibility and process customer rebates. • Conduct QA/QC to verify equipment installation. • Provide customer service and trade ally support. • Track program performance. • Periodically report progress towards program goals and opportunities for improvement. Key pillars of the marketing strategy will include Trade Allies and direct customer marketing, including direct mail, newspaper advertisements, email blasts, bill inserts and HVAC trade publications. Additional marketing tactics will include: • Education. Train and educate Trade Allies on the programs and how to effectively sell the program to customers. • Incentives. Provide incentives to Trade Allies that successfully increase the sale of qualifying measures to customers within the KCP&L service territory. • Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KCP&L will coordinate with specific associations to highlight suitable program offerings. • Highlight successfully completed projects. KCP&L will select projects to display the process and benefits of the program. This type of marketing will spur the customer's competitors to improve building performance and increase business process efficiency. The program will be cross marketed with KCP&L's Business DSM programs, particularly the Business Energy Efficiency Rebate – Custom Program.
Risk Management	The key barriers are return on investment, decision timing and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough vendors are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements. Measure savings are expected to be updated annually. Potential changes to measure savings, costs, and other key assumptions could affect the measure's ability to pass cost-effectiveness tests. Therefore, the mix of measures offered could change from year to year to reflect changes made to the original measure attributes. Incentives will be modified as needed to respond to market prices, with a goal of the incentive being no higher than 50% of the incremental cost. Proper incentives can reduce free ridership while still encouraging customers to participate in the program.

Measures

The consolidated measure list below is set for planning purposes and may be modified to reflect market conditions. Additional measures included in the Company TRM may also be offered.

Measure	
Heat Pump Water Heater	High Efficiency Reach-In Refrigerator/Freezer
Low Flow Faucet Aerator	ECM Motors Walk-In Coolers & Freezers
Pipe Wrap/Insulation	Advanced RTU Controls >2,000 annual hour occupancy
Pre-Rinse Spray Valves	Programmable Thermostat Controls
High Efficiency Pool Pump	High Bay Fluorescent Fixture (HP T8)
Pool Pump VSD	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5)
VSD Pumps/Fan	LED High & Low-Bay Fixture
Smart Power Strip	LED Linear Replacement Lamp replace a T8, T12, or T5
Compressed Air	LED Retrofit Kit replace T8, T12 or T5/T5HO
Variable Speed Drive Compressor	LED Troffer/ Linear Ambient replace T8, T12 or T5/T5HO
Variable Speed ECM Pump	LED Downlight or Retrofit Kit
ENERGY STAR Beverage Machine	28W - 4 ft fluorescent T8 lamp
Strip Curtains	25W - 4 ft fluorescent T8 lamp
High Efficiency PTAC/PTHP	LED Refrigerated/Freezer Case Lights
Air Source Heat Pump <135 kBtuh	Parking Garage T5, T5HP, or T8 replacing HID
Air Sourced Air Conditioner	Parking Garage LED replacing HID
High Volume Low Speed Fans	Exterior LED replacing HID
Directional LED Bulb	Networked Fixture Controls
Omnidirectional LED Bulb	Photocell Occupancy Sensor
Lighting Optimization	Wall-Mount Occupancy Sensor
LED Flood Light	LED Exit Sign
LED Recessed Fixture	Low Wattage T8 Lamp

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	13,304	14,143	14,217	20,000	27,504
KCP&L-KS	10,073	10,854	10,962	16,144	23,370
GMO-SJLP	2,183	2,279	2,292	4,093	5,603
GMO-MPS	6,763	7,153	7,184	11,636	16,417
KCP&L Total	32,323	34,429	34,655	51,873	72,894

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	2.18	2.30	2.31	3.28	4.51
KCP&L-KS	1.64	1.76	1.78	2.66	3.84
GMO-SJLP	0.36	0.37	0.37	0.66	0.91
GMO-MPS	1.07	1.12	1.13	1.84	2.60
KCP&L Total	5.25	5.55	5.59	8.44	11.86

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$2,304,413	$2,314,939	$2,326,202	$2,922,172	$3,978,237
KCP&L-KS	$1,856,421	$1,872,812	$1,892,867	$2,454,265	$3,510,631
GMO-SJLP	$391,671	$392,736	$394,218	$619,917	$840,648
GMO-MPS	$1,188,097	$1,194,482	$1,199,079	$1,702,604	$2,361,597
KCP&L Total	$5,740,602	$5,774,969	$5,812,366	$7,698,958	$10,691,113

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.69	1.84	1.88	2.43	2.51
KCP&L-KS	1.60	1.76	1.79	2.36	2.44
GMO-SJLP	1.65	1.77	1.81	2.35	2.43
GMO-MPS	1.68	1.81	1.85	2.43	2.52
KCP&L Total	1.66	1.80	1.84	2.40	2.48

BUSINESS ENERGY EFFICIENCY REBATE - CUSTOM

Description	The program is designed to provide customers incentives for installing energy efficient measures not explicitly identified in the Standard program. It helps commercial and industrial customers save energy through a broad range of energy efficiency options that address all major end uses and processes. Applications must be pre-approved by KCP&L before equipment is purchased and installed and must have a Total Resource Cost Test benefit-cost ratio of at least 1.0. Incentives, up to 50% of the project cost, were included as a $ per first-year-kWh saved. Participant rebates per program year are limited to the annual cap outlined in the tariff on the company website and applications. Multiple rebate applications for different measures may be submitted. Rebates will be issued upon completion of the project. As a targeted sub-segment, KCP&L and the implementation contractor will work with customers interested in Enhanced Operations for Data Centers to determine project costs, cost-effectiveness, tax credits, and financing options.
Objectives	Encourage the purchase and installation of energy efficient equipment by providing incentives to lower the cost of purchasing efficient equipment for commercial and industrial facilities.
Target Market	All commercial and industrial customers.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Process customer applications, verify eligibility, review pre-approval applications, and process customer rebates. • Conduct QA/QC to verify equipment installation. Randomly inspect 10% of projects and all projects over a threshold determined by KCP&L (e.g., $10,000). • Provide customer service and trade ally support. • Track program performance. • Periodically report progress towards program goals and opportunities for improvement. Key pillars of the marketing strategy will include Trade Allies and direct customer marketing such as direct mail, newspaper advertisements, email blasts, bill inserts and HVAC trade publications. Additional marketing tactics will include: • Education. Train and educate Trade Allies on the programs and how to effectively sell the program to customers. • Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KCP&L will coordinate with specific associations to highlight suitable program offerings. • Highlight successfully completed projects. KCP&L will select projects to display the process and benefits of the program. This type of marketing will spur the customer's competitors to improve building performance and increase business process efficiency. The program will be cross marketed with KCP&L's Business DSM programs, particularly the Business Energy Efficiency Rebate – Standard Program.
Risk Management	The key barriers are return on investment, decision timing, and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough vendors are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.
Measures	Incentives were set for planning purposes and may be modified to reflect market conditions. Incentives, up to a certain percentage of the project cost and up to a maximum annual cap, are paid on a $ per first-year kWh saved basis for all incentives.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	9,599	9,649	9,698	12,287	16,895
KCP&L-KS	3,530	3,601	3,671	4,389	4,942
GMO-SJLP	1,239	1,245	1,251	2,007	2,750
GMO-MPS	3,561	3,580	3,598	5,233	7,370
KCP&L Total	17,929	18,074	18,219	23,916	31,956

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	2.48	2.49	2.50	3.17	4.36
KCP&L-KS	0.91	0.93	0.95	1.13	1.28
GMO-SJLP	0.32	0.32	0.32	0.52	0.71
GMO-MPS	0.92	0.92	0.93	1.35	1.90
KCP&L Total	4.62	4.66	4.70	6.17	8.24

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$1,986,206	$1,996,009	$2,005,812	$2,518,024	$3,429,712
KCP&L-KS	$780,014	$793,857	$808,016	$950,070	$1,059,403
GMO-SJLP	$264,481	$265,706	$266,932	$416,430	$563,476
GMO-MPS	$782,445	$786,121	$789,797	$1,113,300	$1,536,058
KCP&L Total	$3,813,146	$3,841,693	$3,870,557	$4,997,824	$6,588,649

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.30	1.32	1.35	1.56	1.61
KCP&L-KS	1.27	1.29	1.32	1.53	1.58
GMO-SJLP	1.28	1.31	1.33	1.55	1.61
GMO-MPS	1.27	1.30	1.32	1.54	1.60
KCP&L Total	1.29	1.31	1.34	1.55	1.60

STRATEGIC ENERGY MANAGEMENT

Description	The Strategic Energy Management (SEM) Program is a systematic approach to delivering persistent energy savings to organizations by integrating energy management into regular business practices. The program involves appointment of an energy liaison(s) and a team within participating organizations who regularly correspond with program representatives. The program includes two program tracks that use different delivery mechanisms: ***One-on-One Consultative Strategic Energy Management (Consultative SEM)*** provides the customer with access to an energy expert who works intensively with them to integrate energy management into the organization's business practices by helping the customer set up an energy management process and implement improvements. The participant receives frequent and personalized attention throughout the implementation period. Touch points and milestones are agreed upon between the two parties. ***Strategic Energy Management Cohort (SEM Cohort)*** places companies into groups that work alongside each other for one year or longer, coming together in periodic workshops, approximately quarterly, and working on their own between the sessions. The group setting enhances participant action as they strive to perform in front of their peers. Structured groups are composed of 5 to 12 participants that are often located in the same geographical area, sharing best practices and learning together. The group is typically filled with participants from non-competing industries; however, if mutual agreement is established, competitors may participate in the same group. A methodology is developed early in the engagement to forecast each participant's baseline energy consumption, from which savings goals are created and measured. To isolate energy savings attributable to SEM efforts, any savings from equipment measures installed under other programs in the portfolio can be netted out of these savings. SEM has been shown to produce larger and longer lasting energy savings when compared to other energy management offerings. Few customers, however, have the internal resources to pursue and sustain these initiatives on their own, without the support of a utility program.
Objectives	Provide energy education, technical assistance, and company-wide coaching to large commercial and industrial customers to drive behavioral change and transformation of company culture with respect to energy use and management.
Target Market	Customers with high energy use and operational sophistication. The best candidates are likely to have the following attributes: • Large manufacturing companies or commercial facilities with >300 kW peak demand. • Companies and institutional customers with multiple sites (i.e. operations/offices in another state or country). • Customers with commitment to sustainability and environmental stewardship. • Customers in regulated industries. • Companies that have well established management systems like quality/safety or those using continuous improvement practices. • Companies in a stable or rapid growth mode.
Implementation Strategy	The design relies on a Program Administrator and Energy Management Providers. ***Program Administrator:*** KCP&L staff and a third-party implementation contractor to deliver the program and manage administrative functions, such as marketing, customer recruitment, and results tracking. ***Energy Management Providers:*** firms and personnel with specific knowledge and expertise who work with customers to achieve savings. The Energy Management Provider must have a combination of the following: • Experience in customer consulting and change management. • Experience with continuous improvement methodologies. • Experience engaging customer personnel at all levels, particularly executives. • Experience using and deploying management systems such as quality, environmental impact, and safety. • Technical expertise for understanding production process and operations to identify energy savings opportunities.

	• Established track record deploying utility-based SEM programs, driving energy savings along with customer change and customer satisfaction. Program delivery will be integrated with other programs. Customers that have already completed or are currently participating in the Business Energy Efficiency Rebate Programs can achieve additional efficiency gains. If capital measures are identified during the course of participation in SEM, they can be submitted for incentives under the appropriate Business Energy Efficiency Rebate Program. The Program Administrator recruits customers through one-on-one contacts. To achieve goals, the program will likely need to target two- to three-times the participation goal. The recruitment process will build an SEM pipeline, wherein potential participants can be monitored as their priorities and business situations change over time. One-on-one recruiting builds familiarity and trust, providing the basis for successful engagements. *Recruit Customers*. Recruiting requires a two-prong approach at both the facility management and executive levels. KCP&L should leverage relationships with large customers and peer relationships that KCP&L executives have with customer executives. *Screen Customers*. Potential participants will be screened on the size of their connected load and on factors including history of implementing energy efficiency projects, experience with other continuous improvement programs, general responsiveness of plant personnel, etc. Screening will take place through discussions with account managers and preliminary conversations with prospective participants. *Gain Customer Commitment*. As part of the screening process, participating customers will commit to an on-site executive-level sponsor, dedicated program budget, access to key human resources, inclusion of an energy continuous improvement statement within existing corporate goals, and a training program for new and existing personnel. An Energy Management Provider will be assigned to each participant and have primary responsibility for implementing the program and working with the participant. The provider will have three roles: *Project Manager*. Coordinate customer communication and meetings, develop reports. *Organizational Facilitator(s)*. Conduct initial Energy Management Assessment, provide ongoing customer coaching, maintain customer satisfaction, and provide input to energy maps and savings models. Identify and cultivate an energy champion or team leader. *Savings Modeler*. Develop energy maps and savings models. Provide technical assistance to participating customers to understand current energy use, identify opportunities to reduce energy use, and to set energy-use reduction goals. The key marketing message should be that KCP&L is supporting customers to more strategically manage energy and to invest in their future by building an organizational foundation for energy management, providing consultative resources and incentives. Marketing will rely heavily upon presentations and letters, supported by brochures, case studies and success stories. It is important for the marketing materials to: • Provide a basic understanding of the concept of SEM and the program. • Outline the compelling business case (benefits and costs) of participation. • Connect the SEM offering to the existing DSM portfolio.
Risk Management	The most challenging aspect of SEM is maintaining long-term customer commitment, because it directly affects savings persistence. To ensure commitment, the customer must clearly understand the following: • The level of staff time, management review, and other resources they are committing. • The services, such as consulting and training, they will receive. • The benefits, such as a more systematic and proactive approach to managing energy. Successful efforts involve setting rigorous expectations through ongoing meetings with the participant, Energy Management Providers, Program Administrator and KCP&L staff. *Participating Customer and Program Administrator*. To ensure the customer maintains momentum and arrives at an agreed upon success point, a Stage-gate approach is recommended. This includes clearly defined stages based on progress indicators, such as the existence of an energy goal, consistent meetings of an energy team, and the engagement of employees in energy awareness.

Program Administrator, Energy Management Provider(s) and KCP&L. A periodic review meeting on a quarterly basis brings together KCP&L staff, the Program Administrator, and the Energy Management Provider(s) to discuss each participant with respect to successes, challenges, and overall progress. If it is determined that a customer's progress is lagging, they will agree to next steps, including increased engagement scope and discussions with the customer to ensure that they understand program support may be withdrawn if they do not improve performance.

Working with customers' energy and production data is vital to the tracking of progress in this program. The data are frequently proprietary and competition-sensitive, so steps must be taken to establish a secure mechanism and procedure for sharing and storage of data.

Measures

Behavioral and operational energy savings, as measured relative to the participant's personal baseline consumption, are paid incentives on a $ per first-year-kWh saved. These levels were set for planning purposes and may be modified to reflect market conditions.

Separately, capital measures that are adopted due to participation in the Strategic Energy Management Program, and which are eligible for incentives under other programs such as the Business Standard and Custom initiatives, are routed through them and receive the applicable incentives as if they were regular projects. These savings are netted out of the SEM savings and recorded under the Standard or Custom Programs. In this way, SEM also becomes a lead generator for other programs and further drives portfolio success.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1,470	1,470	1,470	2,205	2,499
KCP&L-KS	1,176	1,176	1,176	1,617	1,911
GMO-SJLP	588	588	588	1,029	1,323
GMO-MPS	1,029	1,029	1,029	1,470	1,764
KCP&L Total	4,263	4,263	4,263	6,321	7,497

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.29	0.29	0.29	0.44	0.50
KCP&L-KS	0.24	0.24	0.24	0.32	0.38
GMO-SJLP	0.12	0.12	0.12	0.21	0.27
GMO-MPS	0.21	0.21	0.21	0.29	0.35
KCP&L Total	0.85	0.85	0.85	1.26	1.50

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$248,178	$248,178	$248,178	$362,397	$408,085
KCP&L-KS	$201,283	$201,283	$201,283	$269,814	$315,502
GMO-SJLP	$95,785	$95,785	$95,785	$164,317	$210,004
GMO-MPS	$177,599	$177,599	$177,599	$246,131	$291,818
KCP&L Total	$722,845	$722,845	$722,845	$1,042,659	$1,225,409

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.22	1.25	1.28	1.58	1.70
KCP&L-KS	1.21	1.24	1.26	1.56	1.69
GMO-SJLP	1.28	1.30	1.34	1.64	1.77
GMO-MPS	1.20	1.23	1.25	1.55	1.69
KCP&L Total	1.22	1.25	1.28	1.58	1.71

RETROCOMMISSIONING

Description	The Retrocommissioning Program (RCx) provides participants a study to optimize building energy systems and facility operations. Heavy focus is placed on tuning of energy management systems and automation, but maintenance, operations, and other manual adjustments are also important. Eligible customers receive one of the following fully-funded studies depending upon their building size: ***RCx Lite:*** Buildings with 50,000 and 150,000 square feet and 150 < 500 kW peak demand. A program affiliated dealer completes a targeted assessment and recommend improvements. Customers agree to spend a minimum of $5,000 towards improvements with ≤18 month payback identified through the study. ***RCx Standard:*** Facilities larger than 150,000 square feet and with ≥500 kW peak demand receives a comprehensive study and a verification report with pre- and post-results. Customers agree to spend a minimum of $15,000 towards improvements with ≤18 month payback identified through the study.
Objectives	Encourage commercial and industrial customers to optimize their facility systems and reduce energy consumption.
Target Market	All commercial and industrial customers, as well as qualifying contractors to perform the RCx studies and implement the findings.
Implementation Strategy	KCP&L should engage a third-party implementation contractor to: • Process customer applications, verify customer eligibility and process rebates. • Establish relationships with local certified retrocommissioning contractors and maintain a list of qualified or authorized contractors and trade allies. • Track program performance, including customer and dealer participation as well as verification of reported savings and measure installation. • Develop quality assurance/quality control (QA/QC) procedures and conduct random inspections of projects. • Provide customer service and trade ally support. • Periodically report progress towards program goals and opportunities for improvement. • Provide documented validation of reported savings. Ability to track measures associated with reported savings. • Conduct inspections as required and/or recommended to validate savings. • Market program to customers, trade organizations, etc. as required to meet project participation and savings targets. Develop and maintain comprehensive program marketing plan with focused outreach to target markets. Key pillars of the marketing strategy include trade allies and direct customer marketing such as direct mail, email blasts, KCP&L key account representatives and HVAC trade publications. Additional marketing tactics may include: • Trade Associations. Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KCP&L should coordinate with specific associations to highlight suitable program offerings. • Highlight successfully completed projects. KCP&L should select projects to display the process and benefits of the program. This type of marketing typically spurs the customer's competitors to improve building performance and increase business process efficiency.
Risk Management	The key barriers are return on investment, decision timing and customer internal funding and approval processes. Many customers have internal return on investment hurdles that are quite aggressive, sometimes as short as a one year payback. Another barrier is ensuring that enough service providers are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.
Measures	Behavioral and operational energy savings, as measured relative to the participant's personal baseline consumption, are paid incentives on a $ per first-year-kWh saved. These levels may be modified to reflect market conditions.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1,640	1,640	1,640	2,050	2,460
KCP&L-KS	1,476	1,476	1,476	1,722	1,886
GMO-SJLP	525	525	525	771	935
GMO-MPS	1,394	1,394	1,394	1,640	1,804
KCP&L Total	5,035	5,035	5,035	6,183	7,085

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.33	0.33	0.33	0.41	0.49
KCP&L-KS	0.30	0.30	0.30	0.34	0.38
GMO-SJLP	0.11	0.11	0.11	0.15	0.19
GMO-MPS	0.28	0.28	0.28	0.33	0.36
KCP&L Total	1.01	1.01	1.01	1.24	1.42

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$302,148	$302,148	$302,148	$372,750	$443,352
KCP&L-KS	$272,700	$272,700	$272,700	$315,061	$343,302
GMO-SJLP	$94,781	$94,781	$94,781	$137,143	$165,383
GMO-MPS	$257,739	$257,739	$257,739	$300,101	$328,341
KCP&L Total	$927,368	$927,368	$927,368	$1,125,055	$1,280,378

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.11	1.13	1.16	1.41	1.52
KCP&L-KS	1.11	1.13	1.16	1.40	1.51
GMO-SJLP	1.14	1.16	1.19	1.45	1.56
GMO-MPS	1.11	1.13	1.16	1.41	1.52
KCP&L Total	1.11	1.14	1.16	1.41	1.52

BLOCK BIDDING

Description	The Block Bidding Program seeks to purchase blocks of electric savings by issuing a Request For Proposal (RFP) to eligible customers and third-party suppliers. The RFP details the proposal requirements as well as the electric savings that must be achieved. Customers and/or third parties submit proposals to deliver the requested block of cost-effective electric savings. The electric savings may be achieved in a variety of ways; for example, one customer facility installing energy efficiency equipment or a bundle of projects across multiple sites and/or customers. Bidder proposals are reviewed to: • Verify customer eligibility. • Ensure completeness and accuracy of proposed energy savings. • Screen the proposed measures for cost-effectiveness. All projects must have a Total Resource Cost Test benefit-cost ratio of greater than 1.0. Qualifying and cost-effective bidder proposals are ranked based upon the proposed cost per kWh saved ($/kWh). Program funds are awarded to bidders starting with the lowest $/kWh saved until the funding is depleted. KCP&L enters into contracts with the selected bidders. All projects must receive pre- and post-implementation inspections to verify the existing and upgraded equipment. The acquired savings may differ from the expected savings stated in the contract based upon actual performance and the post-implementation inspection.
Objectives	Encourage high-volume energy savings projects from customers and third-party suppliers working on behalf of customers at lower cost than traditional programs. This program provides an opportunity to organize and procure non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs.
Target Market	Any commercial, industrial or municipal customer as well as third-party suppliers, such as energy service companies, trade allies and performance contractors.
Implementation Strategy	KCP&L staff will administer the Block Bidding Program with assistance from a third-party implementation contractor. Implementation contractor activities include: • Assist with outreach and education to potential bidders. • Review bidder proposals and recommend the bids to be funded. • Perform pre- and post-implementation inspections. • Provide customer service and trade ally support. • Track program performance. • Periodically report progress towards program goals and opportunities for improvement. Marketing will be targeted to third-party suppliers and customers. Tactics will include: • Training sessions to educate third-party suppliers and customers on the program, proposal requirements and any associated paperwork requirements. • Direct outreach via KCP&L key account representatives, news releases, announcements, telephone calls and email. • Highlight successfully completed projects to display the benefits of the program. • Third-party suppliers will promote the program directly to eligible customers.
Risk Management	The most challenging aspect is bidder engagement and the ability to achieve the required blocks of savings. The implementation contractor and KCP&L staff must work closely to ensure potential bidders understand the program requirements and work to correct any issues or concerns that arise in bidder proposals. Customers must be made aware of the ability to bundle projects and/or work with a third-party supplier to achieve the required blocks of electric savings. The implementation contractor and KCP&L staff must work closely with the contracted bidders to ensure projects are being completed in a timely fashion and issues are addressed in a timely fashion.
Measures	Incentives on a dollar per first-year-kWh saved were assumed for planning purposes, but the actual incentive payments will be a result of the individual project bids received during the RFP process. Program management can choose the threshold cost below which they are willing to pay based on the condition of budgets and energy and peak demand savings goals at the time the bids are received.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	2,515	2,515	2,515	5,030	5,030
KCP&L-KS	2,515	2,515	2,515	5,030	5,030
GMO-SJLP	1,257	1,257	1,257	1,257	1,257
GMO-MPS	2,515	2,515	2,515	2,515	2,515
KCP&L Total	8,802	8,802	8,802	13,832	13,832

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.44	0.44	0.44	0.87	0.87
KCP&L-KS	0.44	0.44	0.44	0.87	0.87
GMO-SJLP	0.22	0.22	0.22	0.22	0.22
GMO-MPS	0.44	0.44	0.44	0.44	0.44
KCP&L Total	1.53	1.53	1.53	2.40	2.40

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$346,550	$346,550	$346,550	$673,360	$673,360
KCP&L-KS	$345,343	$345,343	$345,343	$672,152	$672,152
GMO-SJLP	$220,314	$220,314	$220,314	$220,314	$220,314
GMO-MPS	$344,503	$344,503	$344,503	$344,503	$344,503
KCP&L Total	$1,256,710	$1,256,710	$1,256,710	$1,910,329	$1,910,329

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.90	1.95	1.99	2.37	2.44
KCP&L-KS	1.91	1.96	2.00	2.38	2.45
GMO-SJLP	1.68	1.72	1.75	2.06	2.12
GMO-MPS	1.92	1.96	2.00	2.35	2.43
KCP&L Total	1.87	1.92	1.96	2.34	2.41

ONLINE BUSINESS ENERGY AUDIT

Description	The program provides customers access to a free online tool to analyze the energy efficiency of their businesses, educational materials regarding energy efficiency and conservation, and information on KCP&L DSM Programs.
Objectives	Encourage energy education and conservation, as well as further engagement in the broader portfolio of DSM programs.
Target Market	Non-residential customers.
Implementation Strategy	KCP&L will engage a third-party contractor to develop and maintain the online tool(s).
Risk Management	The Online Business Energy Audit Program is an educational program that informs customers of business energy consumption and methods to reduce energy usage. KCP&L will strategize ways to highlight the audit tool on the KCP&L website and increase customer engagement.
Measures	There are no measures.
Projected Energy & Demand Savings Target	Program savings were not estimated for this program since it is deemed an educational program.
Estimated Program Budget	Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$21,001	$21,001	$21,001	$21,001	$21,001
KCP&L-KS	$21,001	$21,001	$21,001	$21,001	$21,001
GMO-SJLP	$21,001	$21,001	$21,001	$21,001	$21,001
GMO-MPS	$21,001	$21,001	$21,001	$21,001	$21,001
KCP&L Total	$84,004	$84,004	$84,004	$84,004	$84,004

Cost-Effectiveness	n/a

SMALL BUSINESS TARGETED

Description	The Small Business Targeted Program offers customers an energy assessment that includes information on potential energy savings and anticipated payback as well as incentives that cover up to 70% percent of the equipment and installation costs. KCP&L will select a third-party implementation contractor that will provide the lighting audit and information on lighting incentives. Incentives will be assigned directly to the contractor, so that the value of utility incentives is reduced directly from the project cost. The program is part of a long-term strategy to raise awareness of energy savings opportunities among business customers and to help them take action using incentives offered by KCP&L.
Objectives	Provide targeted, highly cost-effective measures to small business customers in a quickly deployable program delivery mechanism.
Target Market	Small business customers with an average electric demand of less than 100 kW per year. This group of customers is important and typically underserved by DSM programs since they typically do not have the staffing or financial resources to engage in energy efficiency cost-benefit analysis and project planning.
Implementation Strategy	The implementation strategy will incorporate the following components: *Walk-Through Audits.* Trained auditors complete a walk-through examination of the business using standard audit software, identifying specific energy saving opportunities. The auditor will review the anticipated costs and savings of the measures, along with information on financial resources available to help defray costs. Customers will be provided with a report and check list of recommendations from the audit. *Installation of Measures.* Upon customer approval of a job scope, the implementation contractor will install pertinent lighting measures identified. *Customer Education.* Customers will be educated on energy efficient equipment and KCP&L's full suite of DSM programs. Particular attention will be paid to the areas identified in the audit. KCP&L will hire an implementation contractor to: • Hire qualified, local individuals to conduct energy audits and install efficient lighting equipment. Provide training, ongoing as needed, to auditors. • Ensure that auditors are familiar with all KCP&L DSM programs available to customers. • Assist with program marketing and outreach. • Provide customer service and trade ally support. • Track program performance, including audit requests, audit activities and customer actions. • Periodically report progress towards program goals and opportunities for improvement. The marketing and outreach strategies will include direct customer marketing such as bill inserts, newsletters, email, and on-bill messaging. The auditors will market the program directly to customers. KCP&L will highlight successfully completed projects to display the benefits of the program. This program targets a very specific market that may have limited access to capital. However, the program will encourage customers to participate in other KCP&L DSM programs.
Risk Management	Small business customers are typically a hard-to-reach market, without the time available to become educated on energy efficient equipment and the money available to upgrade to efficient equipment. One potential risk is a limited supply of qualified individuals with the skills to conduct audits and market energy efficiency improvements. A solution is the development of a local network of qualified professionals to provide audit and installation services and to promote the program to customers. The implementation contractor will: • Offer technical training to auditors, including classroom and field sessions. • Offer sales and business process training to help contractors succeed in selling and delivering energy efficiency services.

Measures

The consolidated measure list below represents a set of measures used for planning purposes, but may be modified to reflect market conditions and/or particular customers. Additional custom measures or those included in the Company TRM may also be offered.

Measure	
Low Flow Faucet Aerator	High Bay Fluorescent Fixture (HP T8)
Screw In - LEDs	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5)
Directional LED Bulb	LED High & Low-Bay Fixture
Omnidirectional LED Bulb	LED Linear Replacement Lamp replace a T8, T12, or T5
LED Recessed Fixture	LED Retrofit Kit replace T8, T12 or T5/T5HO
Lighting Optimization	LED Troffer/ Linear Ambient replace T8, T12 or T5/T5HO
Low Wattage T8 Lamp	LED Downlight or Retrofit Kit
Networked Fixture Controls	28W - 4 ft fluorescent T8 lamp
Photocell Occupancy Sensor	25W - 4 ft fluorescent T8 lamp
Wall-Mount Occupancy Sensor	LED Refrigerated/Freezer Case Lights
LED Exit Sign	Parking Garage T5, T5HP, or T8 replacing HID
Exterior LED replacing HID	Parking Garage LED replacing HID
Smart Power Strip	

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	1,008	678	680	976	1,340
KCP&L-KS	1,001	840	851	1,279	1,851
GMO-SJLP	328	248	249	458	628
GMO-MPS	522	368	369	611	857
KCP&L Total	2,859	2,133	2,149	3,324	4,677

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.18	0.13	0.13	0.19	0.26
KCP&L-KS	0.19	0.17	0.17	0.26	0.37
GMO-SJLP	0.06	0.05	0.05	0.09	0.12
GMO-MPS	0.10	0.07	0.07	0.12	0.17
KCP&L Total	0.52	0.42	0.42	0.66	0.92

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$342,348	$342,617	$343,217	$429,674	$594,510
KCP&L-KS	$400,941	$402,070	$403,997	$527,097	$748,525
GMO-SJLP	$120,927	$120,955	$121,140	$185,981	$268,441
GMO-MPS	$187,661	$187,845	$188,071	$275,707	$391,000
KCP&L Total	$1,051,877	$1,053,487	$1,056,425	$1,418,459	$2,002,476

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	1.82	1.10	1.12	1.48	1.51
KCP&L-KS	1.45	1.16	1.19	1.58	1.65
GMO-SJLP	1.63	1.15	1.17	1.61	1.58
GMO-MPS	1.69	1.10	1.12	1.46	1.49
KCP&L Total	1.63	1.13	1.16	1.53	1.57

BUSINESS SMART THERMOSTAT WITH DIRECT LOAD CONTROL

Description	The Business Smart Thermostat with Direct Load Control (DLC) Program pays an incentive to participants to reduce peak demand by controlling their cooling equipment during periods of system peak demand and when there may be delivery constraints within certain load zones. This is done by way of a remotely communicating, programmable thermostat. During a program event, the program operations center sends a signal to the thermostat to adjust its set-point by a few degrees such that the system will consume less energy and run less frequently throughout the max 4-hour event duration. One method of participation will be for customers to receive the thermostat and professional installation for free upon qualification and enrollment in the program. Smart thermostats also achieve energy savings by using occupancy sensors and setback schedules with learning algorithms.
Objectives	Primarily decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours. Also provide annual energy savings.
Target Market	Small & medium Commercial customers who control their heating and cooling with traditional wall-mounted thermostats.
Implementation Strategy	KCP&L will engage a third-party implementation contractor to: • Hire/sub-contract local staff to install the programmable thermostats. • Engage customers, schedule installation appointments and process customer incentives. • Provide customer service support. • Track program performance and event data. • Periodically report progress towards program goals and opportunities for improvement. Events will typically occur between June 1 and September 30, Monday to Friday. Event duration is max 4 hours per day for a maximum of 15 events per year. Customers may opt out of any event. The program will be marketed through direct contact with consumers using newsletters, website, broadcast and print media, and direct mail. The program will be cross marketed with KCP&L's Business DSM programs.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO (regional transmission organization), thereby reducing the utility system peak, required capacity, and the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Having the thermostats available as a resource year-round is potentially of value to system operations in the event of plant maintenance or other grid events. Curtailment in participating homes with electric heat could provide additional risk management capabilities during winter months in the future. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants.
Measures	Customers receive a free communicating, programmable thermostat with installation as well as a modest, annual incentive payments in future years to retain their engagement and participation.

Projected Energy & Demand Savings Target

A NTG ratio of 100% was applied to the energy and demand savings.

Projected Net Incremental Program Savings

Territory	Net MWh Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	669	818	1,265	669	669
KCP&L-KS	446	595	893	595	669
GMO-SJLP	149	223	298	149	149
GMO-MPS	446	595	967	662	669
KCP&L Total	1,711	2,232	3,422	2,075	2,157

Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective.

Projected Net Incremental Program Savings

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	0.36	0.63	0.85	1.62	1.36
KCP&L-KS	0.51	0.67	0.80	1.33	1.32
GMO-SJLP	0.06	0.13	0.18	0.38	0.30
GMO-MPS	0.52	0.68	0.82	1.46	1.35
KCP&L Total	1.44	2.10	2.65	4.78	4.33

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$61,577	$77,159	$107,903	$96,563	$89,423
KCP&L-KS	$49,495	$62,147	$82,166	$80,533	$83,788
GMO-SJLP	$13,472	$19,504	$25,116	$22,376	$20,276
GMO-MPS	$48,721	$61,361	$85,865	$86,721	$84,148
KCP&L Total	$173,265	$220,171	$301,050	$286,193	$277,635

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	4.54	4.86	5.24	6.24	6.76
KCP&L-KS	4.45	4.77	5.11	6.09	6.78
GMO-SJLP	4.42	4.91	5.28	6.31	6.80
GMO-MPS	4.55	4.86	5.23	6.30	6.96
KCP&L Total	4.51	4.84	5.20	6.22	6.83

DEMAND RESPONSE INCENTIVE

Description	The Demand Response Incentive Program provides firm contractual arrangements with customers to pay them an incentive for periodic curtailments at times of system peak demand. Customers enter into a contract for a one-, three- or five-year term and receive a payment/bill credit based upon the curtailable load, the contract term and number of consecutive years under contract. Participants receive notification of an event at least 4 hours prior to the start time.
Objectives	Decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours.
Target Market	Large commercial and industrial customers with load curtailment capability of at least 25 kW.
Implementation Strategy	Curtailment events may occur between June 1 through September 30, Monday through Friday between the hours of 12 pm and 10 pm (holidays are excluded). Event duration is typically 3 to 6 hours per day for a maximum of 15 events per year. KCP&L energy consultants will be vital to coordinating with the largest customers and gaining their participation and collaboration. The program will also be marketed through direct customer outreach as well as newsletters and direct mail. The program will promote KCP&L's Business DSM programs to participating customers.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO, thereby reducing the utility system peak, required capacity, and the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants.
Measures	Customers receive a fixed, capacity-reserve payment in terms of $/kW, based on the number of curtailable kW, the contract term, and number of consecutive years under contract. The fixed payment is supplemented by a performance payment on a $/kWh basis, calculated from the customer's actual load curtailment relative to their baseline load, as calculated by program management.
Projected Energy & Demand Savings Target	A NTG ratio of 100% was applied to the demand savings. Note that we represent the incremental demand savings for DR programs as the total impact of all program participants in any given year who effectively re-enroll on an annual basis to continue curtailing and receiving incentive payments. This makes the incremental savings equal to the cumulative savings from a resource planning and accounting perspective. Projected Net Incremental Program Savings

Territory	Net MW Savings				
	2019	2020	2021	2030	2037
KCP&L-MO	24.68	37.04	49.54	77.92	79.77
KCP&L-KS	4.80	10.68	21.10	43.85	45.43
GMO-SJLP	19.07	19.14	19.14	19.47	19.60
GMO-MPS	35.58	35.63	35.68	36.08	36.27
KCP&L Total	84.14	102.49	125.46	177.32	181.08

Estimated Program Budget

Estimated Annual Budget **HC**

Territory	2019	2020	2021	2030	2037
KCP&L-MO	$60,008	$77,543	$95,288	$135,555	$138,180
KCP&L-KS	$34,283	$47,145	$69,930	$119,700	$123,165
GMO-SJLP	$24,833	$24,885	$24,885	$25,148	$25,253
GMO-MPS	$139,703	$139,860	$140,018	$141,330	$141,960
KCP&L Total	$258,827	$289,433	$330,121	$421,733	$428,558

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness

Territory	2019	2020	2021	2030	2037
KCP&L-MO	114.14	166.10	215.55	317.55	323.75
KCP&L-KS	24.48	53.12	100.55	191.53	197.30
GMO-SJLP	227.20	227.94	227.94	231.58	233.04
GMO-MPS	154.81	154.98	155.15	156.55	157.22
KCP&L Total	115.88	138.85	166.41	224.62	228.62

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EVALUATION, MEASUREMENT AND VERIFICATION

Evaluation, measurement, and verification (EM&V) is designed to support the need for public accountability, oversight, cost-effective program improvements, and documentation of the effects of ratepayer funded efficiency programs. KCP&L should engage an EM&V contractor(s) to conduct process and impact evaluations of the DSM programs. It is important in the program design phase to allocate a sufficient amount of budget for strategic process evaluations and statistically significant impact evaluations to be performed at appropriate intervals on the relevant portions of the portfolio.

EM&V is recommended on a three-year rotating schedule. A process and impact evaluation should be conducted on each program during the three-year program cycle. The process and impact evaluations need not be conducted at the same time. Process evaluations are typically conducted earlier in the program cycle so that any issues uncovered can be addressed immediately, ensuring optimal program performance. Impact evaluations are typically conducted later in the program cycle when program results are accessible and apparent.

PROCESS EVALUATIONS

Process evaluations ensure that a program is operating as intended and provide information that can enable improvements in both the program design and implementation. Process evaluations assess customer understanding, attitudes about, and satisfaction with the program and other educational activities. The EM&V contractor assesses the effectiveness of the marketing and outreach, dealer involvement, and whether implementation milestones are met adequately and on schedule. These evaluations use sales and promotion data maintained by the tracking system as well as customer survey data.

A good process evaluation:

- Assists program implementers and managers structure programs to achieve cost-effective savings while maintaining high levels of customer satisfaction.
- Determines awareness levels to refine marketing strategies and reduce barriers to participation.
- Provides recommendations for changing the program's structure, management, administration, design, delivery, operations or targets.
- Determines if specific best practices should be incorporated.

IMPACT EVALUATIONS

Impact evaluations estimate gross and net demand savings, energy savings, and the cost-effectiveness of installed systems. They are used to verify measure installations, identify key energy assumptions and provide the research necessary to calculate defensible and accurate savings attributable to the program. The selected EM&V contractor develops an evaluation plan that ensures the appropriate measurement of savings in compliance with industry protocols. The impact evaluation also includes an evaluation of net-to-gross components.

MINIMIZE NET-TO-GROSS IMPACTS

Net-to-Gross (NTG) ratios adjust the gross energy and demand savings associated with a program to reflect the overall effectiveness of the program, taking into account free riders and spillover. Free riders and spillover, as determined from an impact evaluation, are defined as:

- **Free Riders**: Customers who participate in energy efficiency programs that would have engaged in the efficient behavior in the absence of the program. The inclusion of free riders overestimates the energy and demand savings associated with a program.
- **Spillover**: Customers who engage in energy efficient behavior due to some influence of a program but who do not participate in a program. For example, if a customer purchases an LED bulb through the Residential Lighting Program and then chooses to purchase an ENERGY STAR® clothes dryer after learning about the benefits of energy efficiency.

Spillover and free ridership act in opposing directions, with spillover increasing a program's energy and demand savings while free ridership diminishes a program's savings.

KCP&L should make an effort to minimize free ridership and maximize spillover by,

- Modifying incentives to respond to market conditions, as needed and practical.
- Verifying customer eligibility to ensure participants are KCP&L customers, as practical.
- Increasing marketing of KCP&L's DSM portfolio.

KCP&L program adjustments to address free ridership and spillover should not negatively impact program implementation or continuity (e.g. KCP&L should not modify incentive levels with a frequency that would compromise program stability and the customer experience). KCP&L should work with program implementation contractors as well as the evaluation contractor(s) to determine if additional action is needed to minimize free ridership and maximize spillover.

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