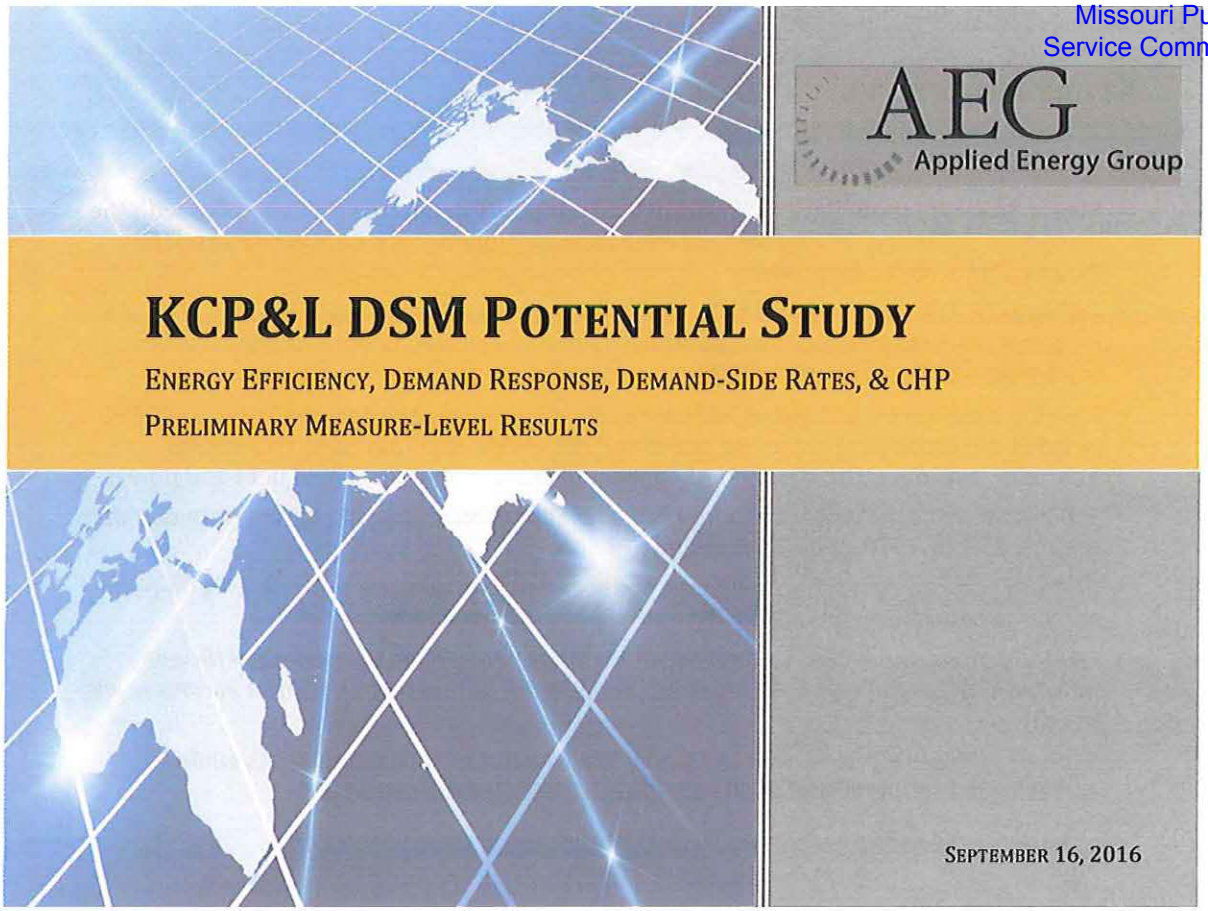
Exhibit 402



AEG Applied Energy Group

OUTLINE

- Study Objectives
- Background & Key Issues
- Energy Efficiency Potential
- Demand Response & Demand-Side Rates Potential
- Combined Heat & Power Potential
- Next Steps (Program Potential, IRP Inputs)

Renew MO Exhibit No. 402
Date 2/22/17 Reporter MH
File No. ER-2016-0285

STUDY OBJECTIVES

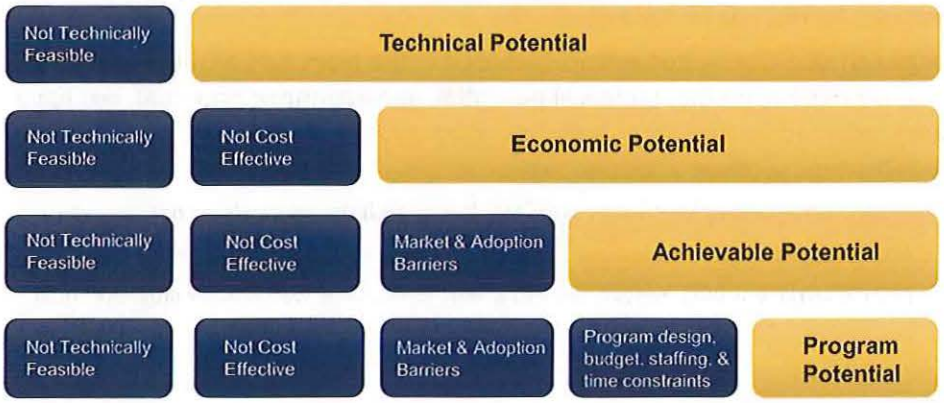
- Meet regulatory requirements: Perform a comprehensive analysis that complies with the respective statutory requirements of the Missouri Public Service Commission and the Kansas Corporate Commission
- Estimate EE, DR and DSR potential: Develop annual electrical energy efficiency, demand response, and demand-side rate potential 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
- Estimate low-income potential: Identify a subset of economic and program potential that is applicable to low-income customers
- Perform accurate saturation surveys: Conduct a reliable, accurate and useful residential appliance saturation survey and C&I end-use saturation survey
- Quantify program savings: Quantify potential program savings from energy efficiency initiatives, demand response programs, and demand-side rate 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

BACKGROUND & KEY ISSUES

- This slide deck presents measure-level potential estimates for 2019-2037 in the KCP&L service territories for all sectors in multiple resource classes:
  - Energy Efficiency
  - Demand Response & Demand-Side Rates
  - Combined Heat & Power
- The results provided here for each resource class are at the measure-level, and have not yet been synthesized and combined in a cohesive portfolio with appropriate cost and delivery frameworks. This is still to come in the "Program Potential" stage of the study.
- All models and assumptions include the results from comprehensive primary market research efforts in the KCP&L service territory conducted as a part of this study. These results have been provided to stakeholders separately and will also be included in the final study report.
- These results are preliminary and may still be subject to change.

DEFINITIONS OF DSM POTENTIAL

- Technical & economic potential are theoretical constructs. Savings cannot actually be realized.
- Achievable potential at the measure-level is calculated by applying take-rates for achievable customer adoption. Component analyses are separate at this point (EE, DR & Rates, CHP)
- Measure-level achievable potential is refined into program potential by applying delivery mechanisms, measure bundling, and appropriate program cost structures.



* 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

ENERGY EFFICIENCY POTENTIAL

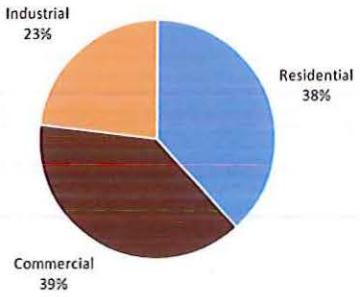
KEY EE ISSUES

- Measure-level economic screen assumes 100% of incremental measure costs and no program administration costs. Program potential will assign incentive and program cost.
- For Low Income Residential measures, the measure-level economic screen has been set to TRC>=0.50 instead of 1.00.
- Large C&I Opt-Out customers are included in the front half of the analysis: baseline market profile, technical potential, and economic potential, but have been removed from realistic and maximum achievable potential (in MO only) by adjusting customer adoption rates.
  - The adjustments vary by market segment, but overall the sector level opt out was:
    - MO Commercial opt-outs remove ~9% of available Commercial load & achievable potential
    - MO Industrial opt-outs remove ~26% of available Industrial load & achievable potential

KCP&L OVERALL BASELINE CHARACTERISTICS

Sector	Annual Electricity Use (GWh)	% of Sales	Summer Peak Demand (MW)	Winter Peak Demand (MW)
Residential	8,585	38%	2,786	2,043
Commercial	8,760	39%	1,578	1,384
Industrial	5,208	23%	938	823
Total	**22,553**	**100%**	**5,302**	**4,250**

Electric Use by Sector, 2015



TAKE RATES

Estimating Customer Adoption of EE

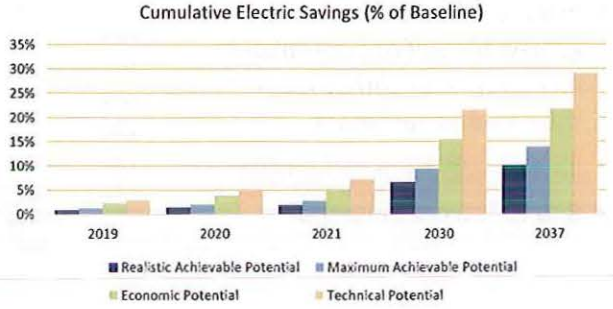
- AEG estimated adoption rates for measure categories by triangulating data from KCP&L's existing programs, benchmark data from other comparable programs, and proprietary market research conducted in the Midwest and around the U.S
- Tables at right show take-rates developed for broad categories of measures, which are then mapped to full universe of measures for use in the potential modeling.
- Take Rates are assumed to rise over time at a rate of 0.5% per year to account for increases in Education, Awareness, Marketing, etc.
- Residential Low Income take rates are lower than the residential sector average. Adjustment factors are 0.80 for high cost measures and 0.92 for low-cost measures.

Residential Measure Take Rate in Base Year	Realistic Achievable Potential	Maximum Achievable Potential
AC Unit	35%	50%
Appliances (Non-Fridge)	31%	45%
Appliances (Refrigerator)	38%	53%
Cooking Equipment	33%	46%
DHW	37%	48%
Electronics	31%	45%
Furnace/Boiler	36%	48%
Geothermal Heat Pump	19%	31%
Lighting - General Service	39%	57%
Lighting - Specialty	12%	18%
Pool Pump	27%	38%
Smart Power Strips	32%	51%
Add / Upgrade Insulation	30%	43%
DHW conservation	27%	43%
Duct Sealing/Insulation	31%	44%
EE Windows	30%	43%
HVAC Maintenance	34%	47%
Lighting Controls	30%	45%
Programmable Thermostat	34%	47%
Smart Thermostat	35%	55%
Whole House Fan	23%	33%
Behavioral	40%	50%

C&I Measure Take Rate in Base Year	Realistic Achievable Potential	Maximum Achievable Potential
Cooking Equipment	38%	64%
DHW	39%	59%
Electronics	37%	58%
Furnace/Boiler	40%	61%
HVAC Cooling	45%	67%
Lighting	44%	69%
Pumps/Motors/Drives EQ	37%	57%
Refrigeration	40%	64%
Retrocommissioning	39%	65%
RTU/Chiller	44%	63%
Add / Upgrade Insulation	37%	57%
Chiller Fans	43%	69%
DHW conservation	39%	58%
Duct Sealing/Insulation	38%	62%
EE Windows	37%	62%
HVAC controls	43%	67%
HVAC maintenance	41%	62%
HVAC motors/pumps	39%	62%
Install an Energy Mgmt Sys.	36%	56%
Lighting Controls	42%	64%
Motors/Drives	42%	54%
Pool Pump Timer	43%	69%
Pre-rinse Spray Valves	38%	66%
Programmable Thermostat	42%	59%
Pumps/Motors/Drives NEM	40%	66%
Retrocommissioning	40%	62%
Strategic Energy Mgmt	35%	60%

KCP&L TOTAL ENERGY EFFICIENCY POTENTIAL

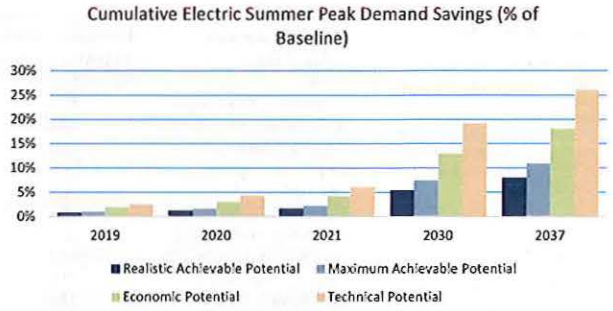
- In 2021, cumulative realistic achievable potential savings are 445 net GWh (1.9% of baseline sales)
- Corresponding savings in the maximum achievable case are 654 net GWh (2.8% of baseline)
- This equates to average annual savings in the range of 0.7% to 1.0%



	2019	2020	2021	2030	2037
Baseline Projection (GWh)	23,313	23,314	23,321	24,457	25,912
Cumulative Net Savings (GWh)					
Realistic Achievable Potential	192	318	445	1,621	2,608
Maximum Achievable Potential	275	465	654	2,288	3,596
Economic Potential	524	889	1,239	3,767	5,614
Technical Potential	678	1,202	1,700	5,263	7,495
Cumulative as % of Baseline					
Realistic Achievable Potential	0.8%	1.4%	1.9%	6.6%	10.1%
Maximum Achievable Potential	1.2%	2.0%	2.8%	9.4%	13.9%
Economic Potential	2.2%	3.8%	5.3%	15.4%	21.7%
Technical Potential	2.9%	5.2%	7.3%	21.5%	28.9%

KCP&L Total Summer Peak Demand Potential

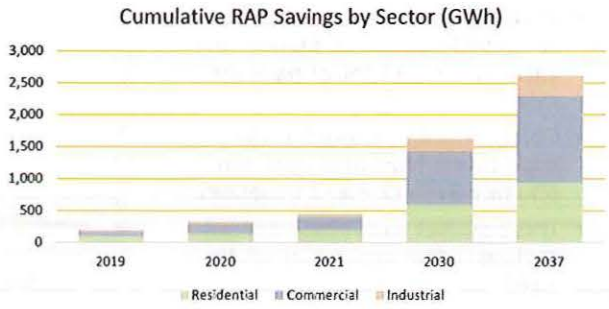
- In 2021, cumulative realistic achievable summer peak demand savings are 82 net MW (1.5% of baseline sales)
- Corresponding savings in the maximum achievable case are 115 net MW (2.2% of baseline)
- This equates to average annual savings in the range of 0.5% to 0.7%



	2019	2020	2021	2030	2037
Baseline Projection (MW)	5,315	5,317	5,319	5,485	5,717
Cumulative Summer Peak Demand Savings (MW)					
Realistic Achievable Potential	38	60	82	290	453
Maximum Achievable Potential	50	82	115	405	620
Economic Potential	98	161	222	711	1,035
Technical Potential	130	226	320	1,053	1,491
Summer Peak Demand Savings (% of Baseline)					
Realistic Achievable Potential	0.7%	1.1%	1.5%	5.3%	7.9%
Maximum Achievable Potential	0.9%	1.5%	2.2%	7.4%	10.8%
Economic Potential	1.8%	3.0%	4.2%	13.0%	18.1%
Technical Potential	2.5%	4.3%	6.0%	19.2%	26.1%

KCP&L Energy Efficiency Potential by Sector

- Around 40% - 50% of achievable savings potential in any given year comes from the commercial sector
- 35% to 50% from residential
- 8 to 12% from industrial



	2019	2020	2021	2030	2037
Realistic Achievable Potential Cumulative Savings (GWh)					
Residential	98	146	194	595	937
Commercial	79	142	206	830	1,351
Industrial	15	30	45	195	320
Total	**192**	**318**	**445**	**1,621**	**2,608**
Maximum Achievable Potential Cumulative Savings (GWh)					
Residential	129	197	265	770	1,192
Commercial	123	222	319	1,225	1,933
Industrial	23	47	70	294	471
Total	**275**	**465**	**654**	**2,288**	**3,596**

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RESIDENTIAL EE
(DETAILED ANALYSIS WALK-THROUGH)

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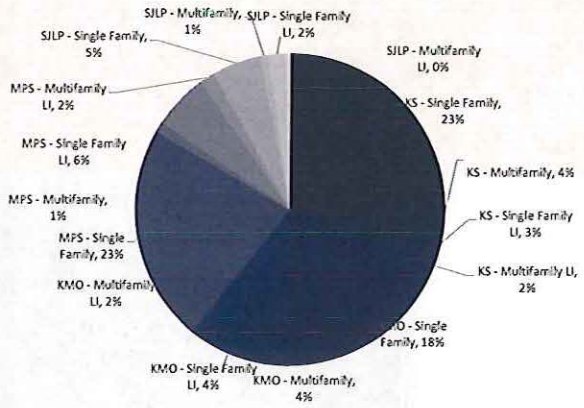
RESIDENTIAL MARKET PROFILE – ELECTRICITY

Segment	Households	Electricity Sales (GWh)	% of Total Usage	Avg. Use / Household (kWh)	Summer Peak Demand (MW)	Winter Peak Demand (MW)
KS - Single Family	131,919	2,011	23%	15,241	707	443
KS - Multifamily	36,770	310	4%	8,433	70	92
KS - Single Family LI	20,344	237	3%	11,649	85	54
KS - Multifamily LI	30,983	181	2%	5,849	42	54
KMO - Single Family	125,094	1,580	18%	12,630	585	341
KMO - Multifamily	48,095	346	4%	7,194	87	95
KMO - Single Family LI	36,401	343	4%	9,424	130	73
KMO - Multifamily LI	33,702	205	2%	6,083	53	59
MPS - Single Family	138,198	1,942	23%	14,053	613	465
MPS - Multifamily	14,845	95	1%	6,420	23	27
MPS - Single Family LI	43,406	493	6%	11,359	155	121
MPS - Multifamily LI	24,607	135	2%	5,480	32	40
SJLP - Single Family	30,475	442	5%	14,505	131	111
SJLP - Multifamily	6,946	64	1%	9,284	13	19
SJLP - Single Family LI	14,802	162	2%	10,916	52	39
SJLP - Multifamily LI	5,461	38	0%	7,019	8	11
Total	**742,047**	**8,585**	**100%**	**11,569**	**2,786**	**2,043**

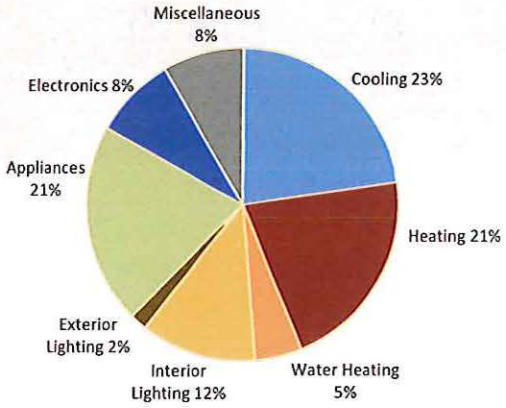
Sources: KCP&L 2016 Residential Customer Survey, KCP&L Billing data, AEG Energy Market Profiles

Residential Market Profile – Electricity

Residential Electric Use by Segment, 2015



Residential Electricity Use by End Use, 2015



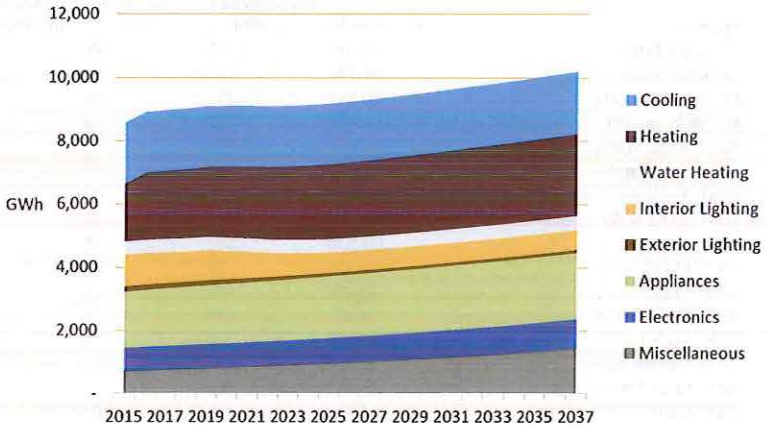
Sources: KCP&L 2016 Residential Customer Survey, KCP&L Billing data, AEG Energy Market Profiles

Residential Baseline Projection

By end use

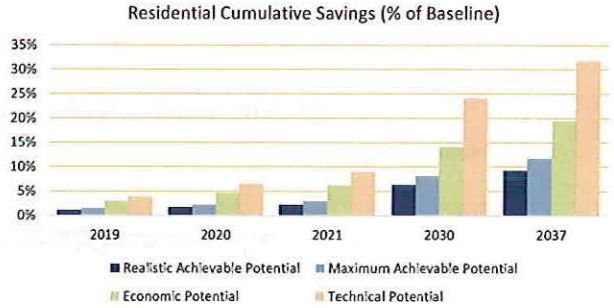
- Baseline projection includes the effects of appliance standards, EISA, and naturally occurring efficiency
- Baseline projection shows load growth of 18.5% by 2037
- Average annual growth of 0.77%

Residential Electricity Projection by End Use



Residential Energy Efficiency Potential

- In 2021, cumulative realistic achievable potential savings are 194 net GWh (2.1% of baseline)



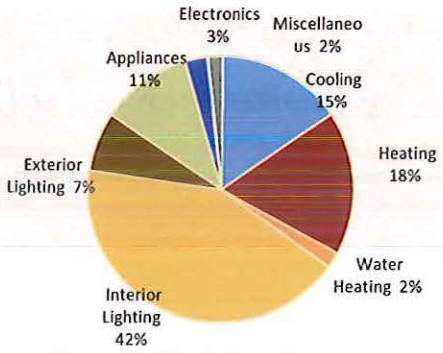
	2019	2020	2021	2030	2037
Baseline Forecast (GWh)	9,091	9,094	9,096	9,541	10,175
Cumulative Savings (GWh)					
Realistic Achievable Potential	98	146	194	595	937
Maximum Achievable Potential	129	197	265	770	1,192
Economic Potential	269	422	565	1,340	1,975
Technical Potential	346	589	819	2,294	3,229
Energy Savings (% of Baseline)					
Realistic Achievable Potential	1.1%	1.6%	2.1%	6.2%	9.2%
Maximum Achievable Potential	1.4%	2.2%	2.9%	8.1%	11.7%
Economic Potential	3.0%	4.6%	6.2%	14.0%	19.4%
Technical Potential	3.8%	6.5%	9.0%	24.0%	31.7%

Residential Top Measures

Top Measures in 2021, Realistic Achievable Potential (RAP)

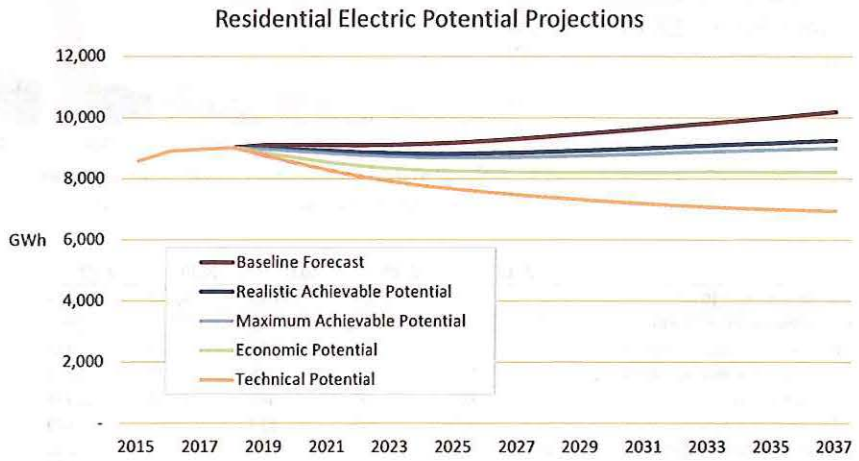
Rank	Measure / Technology	2021 Cumulative Savings (GWh)	% of Total
1	Interior Lighting - General Service Screw-In LED	66.3	34.1%
2	Behavioral Programs	27.7	14.2%
3	Thermostat - WiFi/Interactive	14.2	7.3%
4	Interior Lighting - Exempted Screw-In LED	13.7	7.1%
5	Exterior Lighting - Screw-in LED	12.9	6.6%
6	Cooling - Central AC	8.3	4.3%
7	Rfgr. - Decommissioning and Recycling	8.1	4.2%
8	Insulation - Wall Cavity Installation	6.2	3.2%
9	Insulation - Ceiling Installation	4.8	2.4%
10	Freezer - Decommissioning and Recycling	3.7	1.9%
11	Insulation - Radiant Barrier	3.3	1.7%
12	Ductless Mini Split HP (Ducted Forced Air)	2.6	1.3%
13	Ducting - Repair and Sealing	2.4	1.2%
14	Heating - Air-Source Heat Pump	2.1	1.1%
15	Appliances – Refrigerator	2.1	1.1%
16	Water Heater – Heat Pump (<= 55 Gal)	2.1	1.1%
17	Windows - High Efficiency/ENERGY STAR	1.7	0.9%
18	Electronics - Personal Computers	1.2	0.6%
19	Elec Furnace- Convert to Air-Source Heat Pump	1.2	0.6%
20	Appliances - Freezer	0.9	0.4%
	Total	**185.5**	**95.4%**
	Total RAP savings in 2021	**194.4**	**100%**

End Use Share of Savings, 2021



- LED lighting measures provide the majority of savings since penetration in KCP&L territory is still relatively low
- Wifi thermostats, HVAC measures, and behavioral programs, round out the other biggest savers

RESIDENTIAL BASELINE AND POTENTIAL PROJECTIONS

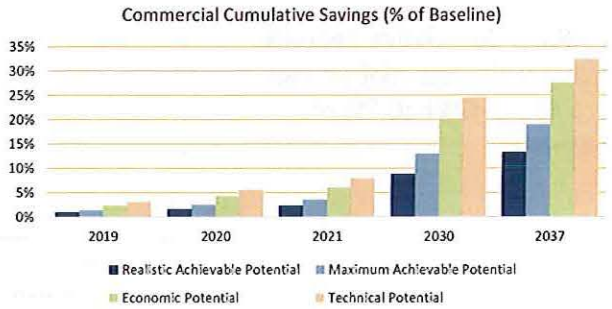


NON-RESIDENTIAL EE

(SOME DETAIL SLIDES MOVED TO APPENDIX)

COMMERCIAL ENERGY EFFICIENCY POTENTIAL

- In 2021, Cumulative Realistic Achievable Potential savings are 206 net GWh (2.3% of baseline)



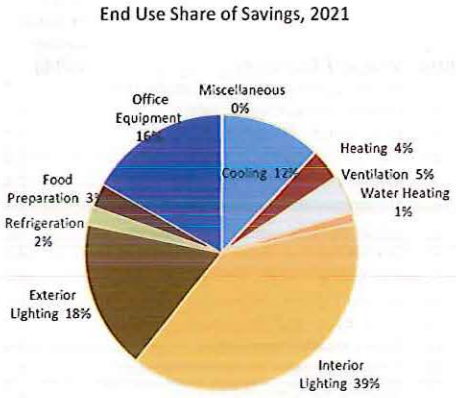
	2019	2020	2021	2030	2037
Baseline Forecast (GWh)	8,870	8,866	8,876	9,471	10,171
Cumulative Savings (GWh)					
Realistic Achievable Potential	79	142	206	830	1,351
Maximum Achievable Potential	123	222	319	1,225	1,933
Economic Potential	207	372	532	1,880	2,806
Technical Potential	270	492	703	2,315	3,289
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.9%	1.6%	2.3%	8.8%	13.3%
Maximum Achievable Potential	1.4%	2.5%	3.6%	12.9%	19.0%
Economic Potential	2.3%	4.2%	6.0%	19.8%	27.6%
Technical Potential	3.0%	5.5%	7.9%	24.4%	32.3%

Note: Potential from MO Opt Out customers has been removed from the Realistic and Maximum Achievable cases

COMMERCIAL TOP MEASURES

TOP MEASURES IN 2021, REALISTIC ACHIEVABLE POTENTIAL (RAP)

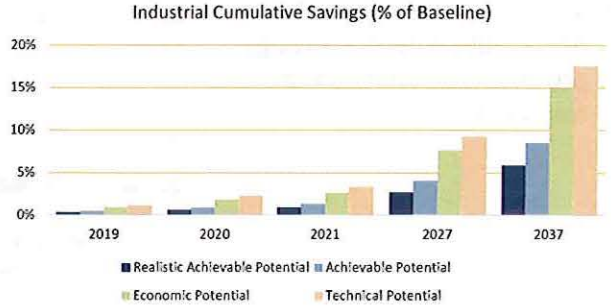
Rank	Measure / Technology	2021 Net Cumulative Savings (GWh)	% of Total
1	Interior Lighting - Linear LED	19.8	9.6%
2	Interior Lighting - Screw-in LED	19.3	9.4%
3	Office Equipment - Server	19.1	9.2%
4	Int. Lighting - High-Bay Fixtures LED	17.1	8.3%
5	Exterior Lighting - Area Lighting LED	16.1	7.8%
6	Exterior Lighting - Screw-in LED	12.5	6.1%
7	Retrocommissioning	12.0	5.8%
8	Office Equipment - Desktop Comp	8.7	4.2%
9	Interior Lighting – Networked Ctrls	7.8	3.8%
10	Cooling - Water-Cooled Chiller	6.2	3.0%
11	Interior Fluorescent - Delamp	6.0	2.9%
12	Ventilation – Ventilation Upgrade	5.9	2.9%
13	Exterior Lighting - Linear Lighting	5.8	2.8%
14	Interior Lighting - Embedded Ctrls	5.3	2.6%
15	Thermostat - WiFi/Interactive	3.9	1.9%
16	Food Preparation - Broiler	3.7	1.8%
17	Data Center - Best Practices	3.4	1.6%
18	Destratification Fans (HVLS)	3.0	1.5%
19	RTU - Advanced Controls	2.1	1.0%
20	Cooling - Air-Cooled Chiller	2.1	1.0%
	Total	**180.0**	**87.3%**
	Total RAP savings in 2021	**206.2**	**100.0%**



- Again, LED lighting provides the most savings potential since penetration in KCP&L territory is still relatively low
- HVAC and office equipment savings also contribute a lot, including substantial opportunity in data centers

INDUSTRIAL ENERGY EFFICIENCY POTENTIAL

- In 2021, Cumulative Realistic Achievable Potential savings are 45 net GWh (0.8% of baseline)



	2019	2020	2021	2027	2037
Baseline Forecast (GWh)	5,352	5,354	5,349	5,404	5,566
Cumulative Savings (GWh)					
Realistic Achievable Potential	15	30	45	142	320
Maximum Achievable Potential	23	47	70	216	471
Economic Potential	48	96	141	412	832
Technical Potential	61	122	178	500	977
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.3%	0.6%	0.8%	2.6%	5.8%
Achievable Potential	0.4%	0.9%	1.3%	4.0%	8.5%
Economic Potential	0.9%	1.8%	2.6%	7.6%	15.0%
Technical Potential	1.1%	2.3%	3.3%	9.3%	17.6%

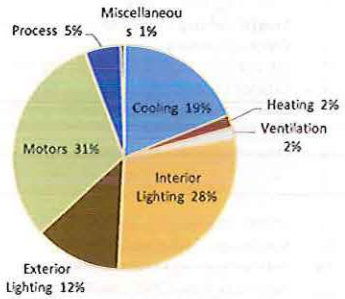
Note: Potential from MO Opt Out customers has been removed from the Realistic and Maximum Achievable cases

INDUSTRIAL TOP MEASURES

TOP MEASURES IN 2021, REALISTIC ACHIEVABLE POTENTIAL (RAP)

Rank	Measure / Technology	2021 Cumulative Savings (GWh)	% of Total
1	Interior Lighting - High-Bay Fixtures LED	5.3	11.8%
2	Cooling - Water-Cooled Chiller	4.1	9.2%
3	Exterior Lighting - Area Lighting LED	3.2	7.1%
4	Process - Timers and Controls	2.5	5.5%
5	Interior Lighting - Linear Lighting LED	2.3	5.1%
6	Compressed Air - Equipment Upgrade	2.2	4.9%
7	Compressed Air - Leak Mgmt Program	2.1	4.7%
8	Interior Lighting - Screw-in LED	2.1	4.7%
9	Int. Lighting - Networked Fixture Ctrls	1.8	4.1%
10	Exterior Lighting - Screw-in	1.8	4.0%
11	Thermostat - WiFi/Interactive	1.7	3.7%
12	Destratification Fans (HVLS)	1.6	3.5%
13	Pumping System - Equipment Upgrade	1.5	3.4%
14	Material Handling - VSD	1.4	3.2%
15	Strategic Energy Management	1.3	2.9%
16	HVAC - Economizer	1.2	2.7%
17	Pumping System - System Optimization	1.1	2.5%
18	Pumping System - Variable Speed Drive	1.1	2.5%
19	Retrocommissioning	1.0	2.3%
20	Int. Lighting - Embedded Fixture Ctrls	0.9	1.9%
	Total	**40.2**	**89.9%**
	Total RAP savings in 2021	**44.8**	**100.0%**

End Use Share of Savings, 2021



- LED lighting savings are large
- Motor system optimization measures provide substantial savings as well
- Some HVAC potential available in chiller equipment and optimization

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BENCHMARKING & COMPARISON

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OTHER POTENTIAL STUDIES

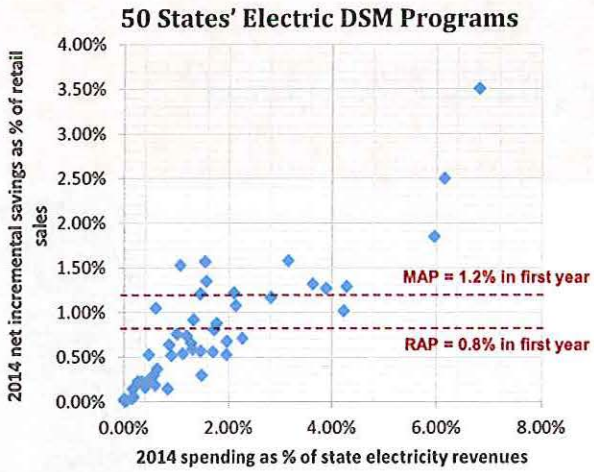
- Caveat: The problem with a direct comparison of potential studies is that they are apples, oranges, pears, mandarins – a whole fruit basket. It is misleading to compare results at face value, and in the table below we show only a small selection of the assumptions and variables that can drive differences in results.
- This direct comparison of raw study results shows that the current KCP&L study estimates substantial savings that are very much within the range of other estimates.
- Compared to several of the other studies, the KCP&L results have similar technical potential, but economic potential is lower due to low avoided costs. As a result, achievable potential is lower too.

			Annual Average Cumulative Potential							
Study	Analysis Period	Analysis years	Achievable Low	Achievable High	Economic	Technical	Gross vs. Net Savings	Persistence vs. Roll-off at End of Measure Life	Inclusion of Multi-Fuel Benefits	Large C&I Opt-Out Considered
KCP&L All (AEG, 2016)	2019-2037	19	0.5%	0.7%	1.1%	1.5%	Net	Measures expire	Only Elec benefits	Yes
KCP&L-MO (Navigant, 2013)	2014-2033	20	0.9%	1.3%	1.7%	2.1%	Gross	No roll-off	Elec & Gas Benefits	Yes
KCP&L-GMO (Navigant, 2013)	2014-2033	20	1.1%	1.4%	1.8%	2.3%	Gross	No roll-off	Elec & Gas Benefits	Yes
KCP&L-KS (Navigant, 2013)	2014-2033	20	0.9%	1.2%	1.6%	2.2%	Gross	No roll-off	Elec & Gas Benefits	Yes
Ameren MO (AEG, 2013)	2016-2030	15	0.8%	1.1%	1.5%	1.9%	Net	Measures expire	Only Elec benefits	Yes
Ameren IL (AEG, 2015)	2017-2036	20	0.6%	0.8%	1.1%	1.6%	Net	Measures expire	Elec & Gas Benefits	No
California IOUs (Navigant, 2015)	2013-2024	12	0.6%			2.0%	Gross	?	Elec & Gas Benefits	No
Indianapolis P&L (AEG, 2014)	2015-2034	20	0.5%		1.2%	1.6%	Net	Measures expire	Only Elec benefits	Yes
New York State (Optimal, 2014)	2013-2032	20	0.9%		2.3%		?	?	Elec & Gas Benefits	No
NWPCC 7th Plan (NWPCC, 2015)	2016-2035	20	0.9%		1.0%	1.2%	Net	?	Elec & Gas Benefits	No
Vermont (GDS, 2014)	2014-2033	20		1.2%	1.4%	1.5%	Gross	?	Elec & Gas Benefits	No

NEAR-TERM PROGRAM ACHIEVEMENTS

THE 2015 ACEEE STATE SCORECARD

- The 2015 ACEEE State Score Card shows that 2014 annual savings cluster between 0% and 1.5% of sales
- Red lines indicate range of achievable savings estimated for first RAP and MAP years.



- *Note Outliers on Electric Graph above 2% Savings: RI and MA (3.5% and 2.5% respectively). States allow counting of substantial CHP, codes & standards, and customer generation toward EERS goals. RI population so small that a single, large CHP project is responsible for 50% increase in 2014 savings relative to 2013 actuals and 2015 plans.*

DEMAND RESPONSE & DEMAND SIDE RATES POTENTIAL

KEY DR AND DSR MODELING ISSUES

- This portion of the analysis evaluates Demand Response and also incorporates the outcomes of the Demand Side Rate development process with Brattle and Stakeholders.
- Demand Response and Demand Side Rates are "program" (not measure) concepts. Customers will not take these actions without a utility offering.
- While the two are quite different from the customers' perspective, they are similar with respect to modeling requirements, so we analyze them together here.
- Some programs will target the same customers so we have to be careful not to overstate participation. We do this as follows:
  - First, we look at each program on a standalone basis (and without an economic screen) in order to assess them individually.
  - Then we create a second case where we impose a participation hierarchy so that customers cannot participate in more than one program. This eliminates double counting.
  - In this "integrated" case, we also apply the economic screen to remove programs that do not have a TRC benefit to cost ratio > 1.0.
- Advanced Metering Infrastructure (AMI) is actively rolling out now, with ~500k meters in the metro area already, and should be completed soon. For this analysis, we assume that AMI is fully available in the years of interest for the study (2019-2037)
- The large C&I customer Opt-Out provision is not applicable to DR and DSR resources, so no associated removal or adjustment is made in this portion of the analysis.

LIST OF DEMAND RESPONSE PROGRAM OPTIONS

Demand Response Options for KCP&L Potential Analysis

Program Option	Eligible Customer Segments	Mechanism	Current Utility Offering?
DLC Space Cooling	Residential, Small C&I	Direct Load Control switch installed on customer's equipment and operated remotely, typically by RF.	
DLC Room AC			
DLC Water Heating			
DLC Space Heating			
DLC Smart Appliances	Residential, Small C&I	Internet-enabled control of operational cycles of white goods appliances.	
DLC Smart Thermostats	Residential, Small C&I	Internet-enabled control of thermostat set points.	Yes
Curtailment Agreements	Large C&I	Customers enact their customized, mandatory curtailment plan. May use stand-by generation. Penalties apply for non-performance. Various delivery mechanisms, contractual payment and penalty structures used – interruptible tariffs, third party aggregation, etc.	Yes
Ice Energy Storage	Small C&I	Peak shifting of primarily space cooling loads using stored ice.	
Battery Energy Storage	All	Peak shifting of loads using batteries on the customer side of the meter (stored electrochemical energy).	
Electric Vehicle DLC Smart Chargers	Residential	Smart, connected EV chargers that would automate vehicle charging such that it occurred preferentially during overnight, off-peak hours.	

- Comprehensive list of DR programs available in the DSM marketplace today and forecasted into the 20-year study time horizon

SELECTING DEMAND-SIDE RATES FOR ANALYSIS

AEG and The Brattle Group held a workshop with KCP&L staff to:

1. Review current KCP&L rates
2. Identify the universe of demand-side rate alternatives
3. Identify strategic pros and cons
4. Compare demand-side rates to KCP&L's current rates
5. Recommend a set of rates for the potential analysis

Out of these discussions, we identified the following 10 rate options for initial, qualitative analysis and consideration:

- **Critical Peak Pricing (CPP)**
- **Demand Charges**
- **Electric Vehicle (EV) Rates**
- **Inclining Block Rates (IBR)**
- **Peak Time Rebates (PTR)**
- **Prepaid Rates**
- **Real-Time Pricing**
- **Seasonal Rates**
- **Time-of-Use (TOU)**
- **Variable Peak Pricing (VPP)**

LIST OF DEMAND-SIDE RATE OPTIONS

To further select DSR options for quantitative analysis; AEG, Brattle, and KCP&L then met with stakeholders, gathered their input, considered the degree of departure from KCP&L's current rates, weighed the strategic pros and cons, and considered the analysis schedule and budget.

The final conclusion of the qualitative analysis was to proceed with the following rates for inclusion in the quantitative models:

Program Option	Eligible Customer Segments	Mechanism
Demand Rates	Residential	Opt-in rate that includes a billing component based on a customer's peak demand in a given month. This rate structure has traditionally been reserved for C&I customers, but better reflects the grid's evolving underlying cost structure and is being considered for residential application. Opt-in and opt-out options correspond to RAP and MAP respectively. We also investigate the effects of this rate on customers with electric vehicles, who would in effect have an "enabling technology" in the form of their EV that would enable them to shift large amounts of usage and demand by charging their EV on off-peak hours.
Time-of-use Rates	Residential, Small C&I, Large C&I	Higher rate for a particular block of hours that occurs every day. Requires interval meters. Opt-in and opt-out options correspond to RAP and MAP respectively. Similarly to demand rate, we also investigated TOU rates for customer with electric vehicles.
Real-time Pricing	Small C&I, Large C&I	Dynamic rate that fluctuates throughout the day based on energy market prices. Requires interval meters. This is modeled with an opt-in roll-out, which is the only typical implementation that has been observed in the industry. Low and high opt-in participation levels are assumed for RAP and MAP respectively.
Inclining Block Rates	Residential	Higher per-unit charge for incremental blocks of monthly energy usage. This is modeled with a mandatory roll-out, which is the only typical implementation that has been observed in the industry. We investigate two cases here, one where the fixed charge remains the same, and another where the fixed charge increases in a manner that is often done in these implementations to preserve revenue stability.

PARTICIPATION HIERARCHY

- The DR and DSR options are stacked in a loading order for modeling to account for interactions among programs which would compete for the same customers
- With the hierarchy, each successive program has a newly updated pool of eligible participants, where customers enrolled in previously-loaded resource options have been removed from consideration.
- The programs' participation rates are then applied to that pool, rather than the entire population pool. DR loaded first since they are generally preferred by resource planners as more firm & dispatchable.

Loaded First

Loaded Last

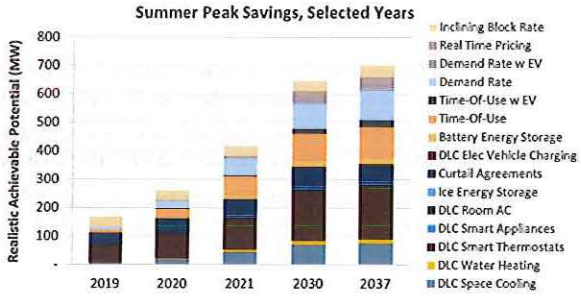
Customer Class	Residential	Small C&I	Large C&I
DLC Space Cooling	x	x	
DLC Space Heating	x	x	
DLC Water Heating	x	x	
DLC Smart Thermostats	x	x	
DLC Smart Appliances	x		
DLC Room AC	x		
Ice Energy Storage		x	
Curtail Agreements			x
Battery Energy Storage	x	x	x
DLC Elec Vehicle Charging	x		
Time-Of-Use	x	x	x
Time-Of-Use w EV	x		
Demand Rate	x		
Demand Rate w EV	x		
Real Time Pricing		x	x
Inclining Block Rate	x		

STANDALONE DR & DSR POTENTIAL RESULTS BEFORE ECONOMIC SCREEN

SUMMER PEAK SAVINGS POTENTIAL

STANDALONE, BEFORE ECONOMIC SCREEN

- DLC Smart thermostat and Curtailment programs are existing KCP&L programs. 2018 was calibrated to match existing program performance
- Top savers in 2037 are DLC Smart Thermostat, TOU Rate, and Demand Rate
- Sum Total not applicable since not all programs can run simultaneously in the standalone analysis case



Realistic Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
Baseline Forecast (Summer MW)	**5,347**	**5,321**	**5,276**	**5,240**	**5,423**	
DLC Space Cooling	6.26	19.00	44.86	70.52	75.21	1.39%
DLC Space Heating	-	-	-	-	-	0.00%
DLC Water Heating	1.18	3.60	8.54	13.98	15.39	0.28%
DLC Smart Thermostats	61.39	86.75	112.67	178.96	190.94	3.52%
DLC Smart Appliances	0.53	1.59	3.73	5.60	5.76	0.11%
DLC Room AC	0.37	1.10	2.56	3.64	3.59	0.07%
Ice Energy Storage	0.42	1.27	2.98	4.40	4.51	0.08%
Curtail Agreements	42.27	48.69	54.83	65.79	56.26	1.04%
DLC Elec Vehicle Charging	0.04	0.14	0.40	1.91	2.74	0.05%
Battery Energy Storage	1.91	5.78	13.57	20.29	20.86	0.38%
Time-Of-Use	9.57	28.65	66.47	96.65	110.57	2.04%
Time-Of-Use w EV	0.33	1.18	3.32	15.79	22.65	0.42%
Demand Rate	8.80	26.36	61.18	89.21	104.76	1.93%
Demand Rate w EV	0.33	1.18	3.32	15.78	22.63	0.42%
Real Time Pricing	0.11	0.91	3.15	27.74	23.75	0.44%
Inclining Block Rate	35.96	35.88	35.70	36.43	42.78	0.79%

Maximum Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
Baseline Forecast (Summer MW)	**5,347**	**5,321**	**5,276**	**5,240**	**5,423**	
DLC Space Cooling	7.24	21.99	51.90	81.54	86.91	1.60%
DLC Space Heating	-	-	-	-	-	0.00%
DLC Water Heating	1.77	5.40	12.81	20.97	23.08	0.43%
DLC Smart Thermostats	100.01	126.70	152.68	219.95	234.63	4.33%
DLC Smart Appliances	0.79	2.38	5.60	8.40	8.64	0.16%
DLC Room AC	0.55	1.64	3.84	5.46	5.39	0.10%
Ice Energy Storage	0.63	1.91	4.46	6.60	6.76	0.12%
Curtail Agreements	60.48	76.75	87.37	98.68	84.40	1.56%
DLC Elec Vehicle Charging	0.06	0.21	0.60	2.87	4.11	0.08%
Battery Energy Storage	3.45	10.40	24.41	36.43	37.42	0.69%
Time-Of-Use	257.43	247.91	237.80	211.77	232.01	4.28%
Time-Of-Use w EV	3.89	4.68	5.64	18.80	26.96	0.50%
Demand Rate	188.73	182.68	176.11	162.55	190.88	3.52%
Demand Rate w EV	3.89	4.68	5.64	18.78	26.94	0.50%
Real Time Pricing	5.95	37.78	70.54	47.77	40.90	0.75%
Inclining Block Rate	35.96	35.88	35.70	36.43	42.78	0.79%

REALISTIC ACHIEVABLE LEVELIZED COSTS PER SUMMER KW

STANDALONE, BEFORE ECONOMIC SCREEN

- Largest contributor to peak reduction, DLC Smart Thermostat, and many others have levelized well below $100/kW-year.
- DLC Electric Vehicle very highest levelized costs due to high technology/equipment costs and fixed admin costs.
- Considering adding a benefit to EV-related DR and Rate options for highly-localized avoided T&D infrastructure costs.
- Similar cost situation with Battery Storage and Ice Energy Storage
- 20 year average TRC ratio only assigns value of capacity to summer demand savings.

Levelized $ / Summer kW-year @ Meter 2018-2037

Option	KCP&L-MO	GMO-MPS	GMO-SJLP	KCP&L-KS	System Wtd Avg Levelized $/kW (2018-2037)	20 Year TRC Ratio
Residential_DLC Space Cooling	$46.94	$47.08	$46.84	$47.10	**$47.03**	3.07
Residential_DLC Space Heating						
Residential_DLC Water Heating	$89.40	$89.09	$88.30	$89.22	**$89.08**	1.65
Residential_DLC Smart Thermostats	$49.36	$49.82	$53.88	$50.02	**$50.00**	2.92
Residential_DLC Smart Appliances	$237.07	$237.47	$234.15	$238.62	**$237.45**	0.83
Residential_DLC Room AC	$119.49	$132.59	$128.21	$129.26	**$126.67**	1.14
Residential_DLC Elec Vehicle Charging	$254.67	$248.95	$255.08	$255.53	**$253.58**	0.79
Residential_Battery Energy Storage	$233.05	$233.40	$230.46	$234.38	**$233.37**	0.49
Residential_Time-Of-Use	$3.88	$3.58	$3.70	$2.80	**$3.37**	55.23
Residential_Time-Of-Use w EV	$10.42	$10.07	$10.52	$10.51	**$10.37**	19.10
Residential_Demand Rate	$6.17	$6.05	$6.25	$4.41	**$5.45**	34.91
Residential_Demand Rate w EV	$5.79	$43.27	$45.05	$30.07	**$5.76**	35.41
Residential_Inclining Block Rate	$42.57	$43.27	$45.05	$30.07	**$38.01**	8.81
C&I_DLC Space Cooling	$65.39	$64.97	$65.02	$65.56	**$65.29**	2.20
C&I_DLC Space Heating						0.05
C&I_DLC Water Heating	$79.86	$79.16	$79.24	$80.15	**$79.69**	1.84
C&I_DLC Smart Thermostats	$45.29	$41.36	$46.35	$40.76	**$42.84**	3.39
C&I_Curtail Agreements	$55.00	$55.00	$55.57	$55.00	**$55.06**	2.54
C&I_Ice Energy Storage	$197.75	$194.74	$195.09	$198.97	**$197.00**	0.68
C&I_Battery Energy Storage	$255.86	$247.77	$264.33	$257.27	**$254.12**	0.40
C&I_Time-Of-Use	$1.69	$3.14	$1.90	$2.60	**$2.24**	84.16
C&I_Real Time Pricing	$4.31	$5.59	$5.62	$5.53	**$5.14**	37.36

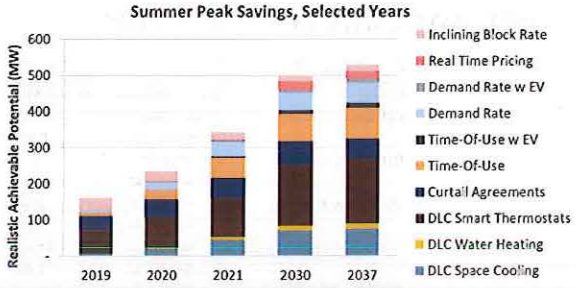
Integrated DR & DSR Potential Results With Economic Screen of TRC>1.0

Integrated here means that the participation hierarchy is activated and program interactions are accounted for to avoid double-counting.

Summer Peak Savings Potential

Integrated, with Economic Screen

- Realistic achievable potential reaches 527.41 MW in 2037, equal to reducing KCP&L's summer forecast by 9.73%. MAP is 11.57%.
- Top savers in 2037 are DLC Smart Thermostat, Demand Rate, DLC Central AC, TOU Rate, and Large C&I Curtailment Agreements
- Several not cost effective: DLC Smart Appliances, DLC Room AC, DLC EV Charging, Ice Energy Storage, and Battery Storage



Realistic Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
Baseline Forecast (Summer MW)	**5,347**	**5,321**	**5,276**	**5,240**	**5,423**	
Achievable Potential (MW)	**160.02**	**233.68**	**341.65**	**497.66**	**527.41**	**9.73%**
DLC Space Cooling	6.26	19.00	44.86	70.52	75.21	1.39%
DLC Space Heating	-	-	-	-	-	0.00%
DLC Water Heating	1.18	3.60	8.54	13.98	15.39	0.28%
DLC Smart Thermostats	61.01	85.14	107.79	167.33	178.05	3.28%
DLC Smart Appliances	-	-	-	-	-	0.00%
DLC Room AC	-	-	-	-	-	0.00%
Ice Energy Storage	-	-	-	-	-	0.00%
Curtail Agreements	42.27	48.69	54.83	65.79	56.26	1.04%
DLC Elec Vehicle Charging	-	-	-	-	-	0.00%
Battery Energy Storage	-	-	-	-	-	0.00%
Time-Of-Use	8.98	25.94	57.34	76.87	86.56	1.60%
Time-Of-Use w EV	0.30	0.97	2.28	8.88	12.60	0.23%
Demand Rate	7.97	21.62	41.72	49.41	57.15	1.05%
Demand Rate w EV	0.29	0.89	1.83	6.32	8.92	0.16%
Real Time Pricing	0.11	0.88	2.90	24.13	20.65	0.38%
Inclining Block Rate	31.65	26.96	19.57	14.44	16.62	0.31%

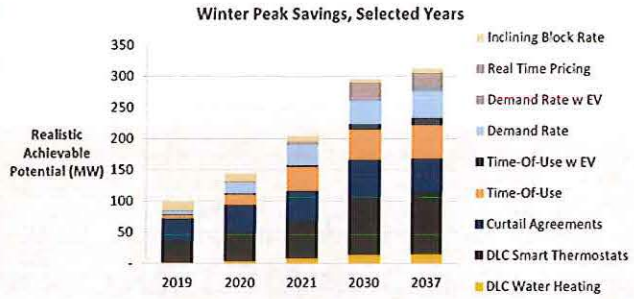
Maximum Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
	5,347	**5,321**	**5,276**	**5,240**	**5,423**	
	413.68	**462.00**	**520.92**	**608.10**	**627.47**	**11.57%**
	7.24	21.99	51.90	81.54	86.91	1.60%
	-	-	-	-	-	0.00%
	1.77	5.40	12.81	20.97	23.08	0.43%
	99.30	124.04	145.16	203.63	216.55	3.99%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	60.48	76.75	87.37	98.68	84.40	1.56%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	237.32	221.84	204.20	168.74	179.85	3.32%
	0.03	0.14	0.28	2.19	3.10	0.06%
	1.68	6.18	9.82	18.61	21.45	0.40%
	0.00	0.00	0.02	0.34	0.48	0.01%
	5.85	5.61	9.22	12.74	10.91	0.20%
	0.00	0.05	0.14	0.65	0.75	0.01%

WINTER PEAK SAVINGS POTENTIAL

INTEGRATED, WITH ECONOMIC SCREEN

- Realistic achievable potential reaches 312.69 MW in 2037, equal to reducing KCP&L 's winter forecast by 7.68% MAP is 8.92%%
- Top savers in 2037 are DLC Smart Thermostat, Demand Rate, and Large C&I Curtailment Agreements
- Space Heating DLC excluded because not cost effective, again because no modeled value to winter capacity.



Realistic Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
Baseline Forecast (Summer MW)	**4,214**	**4,192**	**4,123**	**3,993**	**4,214**	
Achievable Potential (MW)	99.81	144.04	204.61	296.02	312.69	7.68%
DLC Space Cooling	-	-	-	-	-	0.00%
DLC Space Heating	-	-	-	-	-	0.00%
DLC Water Heating	1.18	3.60	8.54	13.98	15.39	0.38%
DLC Smart Thermostats	33.82	47.19	59.74	92.74	98.70	2.42%
DLC Smart Appliances	-	-	-	-	-	0.00%
DLC Room AC	-	-	-	-	-	0.00%
Ice Energy Storage	-	-	-	-	-	0.00%
Curtail Agreements	36.56	42.54	47.96	58.89	53.87	1.32%
DLC Elec Vehicle Charging	-	-	-	-	-	0.00%
Battery Energy Storage	-	-	-	-	-	0.00%
Time-Of-Use	6.13	17.66	38.69	49.40	53.89	1.32%
Time-Of-Use w EV	0.28	0.90	2.12	8.27	11.74	0.29%
Demand Rate	6.60	17.81	33.96	37.71	42.23	1.04%
Demand Rate w EV	0.33	1.01	2.08	7.21	10.18	0.25%
Real Time Pricing	0.09	0.75	2.51	21.59	19.77	0.49%
Inclining Block Rate	14.81	12.56	9.00	6.23	6.94	0.17%

Maximum Achievable Potential

	2019	2020	2021	2030	2037	2037 as % of Baseline
	4,250	**4,202**	**4,196**	**4,209**	**4,214**	
	288.49	313.02	333.95	368.08	376.32	8.92%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	1.77	5.40	12.81	20.97	23.08	0.55%
	55.07	68.70	80.38	112.82	119.99	2.85%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	52.72	67.61	76.85	88.33	80.80	1.92%
	-	-	-	-	-	0.00%
	-	-	-	-	-	0.00%
	172.38	161.15	147.46	117.65	122.41	2.90%
	0.03	0.13	0.26	2.04	2.89	0.07%
	1.39	5.09	7.99	14.20	15.84	0.38%
	0.00	0.01	0.02	0.39	0.55	0.01%
	5.13	4.91	8.11	11.40	10.44	0.25%
	0.00	0.02	0.06	0.28	0.31	0.01%

SUMMER REALISTIC ACHIEVABLE POTENTIAL BY PROGRAM AND TERRITORY

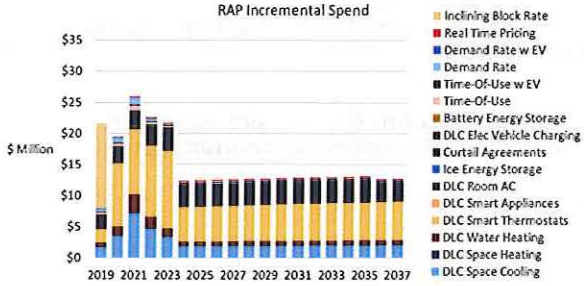
INTEGRATED, WITH ECONOMIC SCREEN

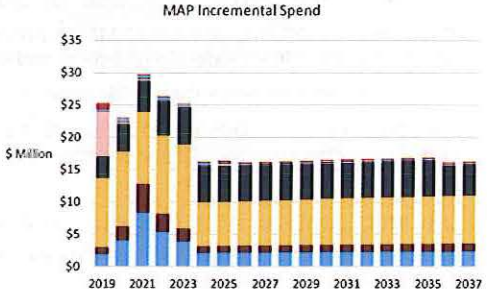
Sum of 2037		State				
Option	**Customer Class**	**KCP&L-MO**	**GMO-MPS**	**GMO-SJLP**	**KCP&L-KS**	**Grand Total**
DLC Space Cooling	Residential	22.90	21.65	4.85	23.11	**72.51**
	Small C&I	0.91	0.79	0.20	0.80	**2.70**
DLC Space Heating	Residential					
	Small C&I					
DLC Water Heating	Residential	3.04	5.02	2.14	4.79	**15.00**
	Small C&I	0.13	0.11	0.03	0.12	**0.39**
DLC Smart Thermostats	Residential	54.91	51.87	11.66	55.19	**173.64**
	Small C&I	1.49	1.29	0.32	1.31	**4.41**
DLC Smart Appliances	Residential					
DLC Room AC	Residential					
Ice Energy Storage	Small C&I					
Curtail Agreements	Large C&I	19.87	12.45	6.65	17.30	**56.26**
DLC Elec Vehicle Charging	Residential					
Battery Energy Storage	Residential					
	Small C&I					
	Large C&I					
Demand Rate	Residential	20.66	12.37	2.95	21.16	**57.15**
Demand Rate w EV	Residential	4.77	1.91	1.09	1.16	**8.92**
Time-Of-Use	Residential	28.74	16.96	4.11	28.88	**78.69**
	Small C&I	0.08	0.08	0.02	0.11	**0.29**
	Large C&I	2.67	1.68	0.90	2.33	**7.58**
Time-Of-Use w EV	Residential	6.78	2.67	1.54	1.61	**12.60**
Real Time Pricing	Small C&I	0.21	0.20	0.05	0.28	**0.74**
	Large C&I	7.03	4.41	2.35	6.12	**19.92**
Inclining Block Rate	Residential	5.95	3.61	0.85	6.21	**16.62**
Grand Total		**180.15**	**137.09**	**39.70**	**170.48**	**527.41**

ACHIEVABLE POTENTIAL PROGRAM COSTS

INTEGRATED, WITH ECONOMIC SCREEN

- Costs higher for new programs in the first several years are because of recruitment, marketing, and the installation of equipment like DLC switches for new participants
- Program costs drop off after 2023 as programs are maintained with few new participants and lower associated costs (i.e. equipment or marketing)
- Note only cost effective options included





Realistic Achievable Potential

	2019	2020	2021	2027	2037
Total Annual Spend (Million $)	**$21.50**	**$19.47**	**$25.99**	**$12.62**	**$12.74**
DLC Space Cooling	$1.77	$3.59	$7.27	$1.99	$2.14
DLC Space Heating	-	-	-	-	-
DLC Water Heating	$0.67	$1.41	$2.91	$0.66	$0.75
DLC Smart Thermostats	$2.25	$10.27	$10.53	$5.79	$6.24
DLC Smart Appliances	-	-	-	-	-
DLC Room AC	-	-	-	-	-
Ice Energy Storage	-	-	-	-	-
Curtail Agreements	$2.32	$2.68	$3.02	$3.63	$3.11
DLC Elec Vehicle Charging	-	-	-	-	-
Battery Energy Storage	-	-	-	-	-
Time-Of-Use	$0.29	$0.48	$0.82	$0.12	$0.10
Time-Of-Use w EV	$0.10	$0.10	$0.11	$0.10	$0.10
Demand Rate	$0.47	$0.75	$1.09	$0.09	$0.09
Demand Rate w EV	$0.04	$0.04	$0.05	$0.04	$0.04
Real Time Pricing	$0.02	$0.06	$0.11	$0.10	$0.10
Inclining Block Rate	$13.57	$0.08	$0.08	$0.10	$0.09

Maximum Achievable Potential

2019	2020	2021	2027	2037
$25.27	**$23.07**	**$29.77**	**$16.22**	**$16.27**
$2.03	$4.14	$8.42	$2.28	$2.46
-	-	-	-	-
$1.00	$2.11	$4.36	$0.99	$1.12
$10.71	$11.59	$11.20	$7.01	$7.54
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
$3.33	$4.22	$4.81	$5.44	$4.66
-	-	-	-	-
-	-	-	-	-
$6.99	$0.35	$0.33	$0.11	$0.11
$0.06	$0.06	$0.06	$0.09	$0.09
$0.22	$0.45	$0.39	$0.09	$0.09
$0.01	$0.02	$0.02	$0.03	$0.03
$0.87	$0.03	$0.07	$0.10	$0.09
$0.05	$0.10	$0.12	$0.09	$0.09

COMBINED HEAT & POWER POTENTIAL

KEY CHP ISSUES

- Assessment of electricity potential for CHP systems in KCPL service territory
  - Customers in MO that opt-out of MEEIA programs have been removed from achievable potential levels, but are still included in technical and economic potential
  - This is the same treatment as in EE analysis.
- Low adoption rates because these are highly complex systems that require significant capital investment, persistent staffing and O&M costs, and substantial coordination between utility and facility.
- Economics consider both electricity and natural gas
  - Benefits: offset of purchased electricity with onsite generation, offset of typical boiler operation with waste heat recovery
  - Costs: first-year installation costs, utility program administration costs as, purchase of natural gas fuel, persistent non-energy O&M
- Possible accounting mechanism for achievements/targets (Not implemented here. Presented for discussion.)
  - Note that, for the counting of savings achievements toward goals, the Illinois TRM section 4.4.32 prescribes an adjustment to the accounting of electric and natural gas inputs and outputs such that electric savings are discounted to 70% of actual production and net natural gas consumption is discounted to zero. This effectively trades the net natural gas fuel increases for a slightly lower value of electric savings.
  - In this case, the values presented here would be adjusted downward by 30% to be counted toward MEEIA goals only, but would not be adjusted for load forecasting or resource planning purposes.

KEY ASSUMPTIONS

- 10 configurations of CHP systems considered
- One-time customer incentive of $300/kW
- Utility admin cost assumed as 5% of incentive
- Participation rates start at 49% (MAP) and 32% (RAP) in the first year

Sector	Technology	Typical System Size (kW)	Lifetime	$/kW Installed cost
Commercial	Fuel Cell w/ Heat Recovery (200 kW)	200	8	$11,672.81
Industrial	Fuel Cell w/ Heat Recovery (1000 kW)	1,000	8	$11,672.81
Commercial	Recip Engine w/ Heat Recovery (100 kW)	100	10	$2,958.00
Industrial	Recip Engine w/ Heat Recovery (1500 kW)	1,500	10	$2,390.40
Commercial	CT w/ Heat Recovery (3 MW)	3,000	20	$3,170.48
Industrial	CT w/ Heat Recovery (5 MW)	5,000	20	$2,638.51
Commercial	Microturbine w/ Heat Recovery (200 kW)	200	10	$3,213.00
Data Centers	Microturbine w/ Heat Recovery (1000 kW) & Absorption Chiller (450-ton)	1,000	10	$3,334.71
Commercial	Steam Turbine w/ Heat Recovery (4 MW)	4,000	30	$794.29
Industrial	Steam Turbine w/ Heat Recovery (15 MW)	15,000	30	$605.00

- Other measure inputs are available to view in the model file, including: peak coincidence factors, efficiency factors, non-fuel O&M costs, available tax credits, natural gas fuel use and displaced fuel/energy use from the heating system
- Federal Tax credits: 30% of cost for fuel cells, 0% for steam turbines, and 10% for the others.

MEASURE RESULTS – ENERGY

Rank	Measure / Technology	2021 Cumulative RAP Savings (GWh)	% of Total	2021 Cumulative Technical Potential Savings (GWh)	2021 Cumulative Economic Potential Savings (GWh)	2021 Cumulative MAP Savings (GWh)
1	Industrial - Steam Turbine w/ Heat Recovery	1.5	78.7%	6.1	6.1	2.3
2	Commercial - Steam Turbine w/ Heat Recovery	0.4	21.3%	1.3	1.3	0.6
3	Commercial - Fuel Cell w/ Heat Recovery	0.0	0.0%	67.3	0.0	0.0
4	Commercial - Recip Engine w/ Heat Recovery	0.0	0.0%	36.8	0.0	0.0
5	Commercial - CT w/ Heat Recovery	0.0	0.0%	21.0	0.0	0.0
6	Commercial - Microturbine w/ Heat Recovery	0.0	0.0%	36.8	0.0	0.0
7	Industrial - Fuel Cell w/ Heat Recovery	0.0	0.0%	63.6	0.0	0.0
8	Industrial - Recip Engine w/ Heat Recovery	0.0	0.0%	72.4	0.0	0.0
9	Industrial - CT w/ Heat Recovery	0.0	0.0%	71.2	0.0	0.0
10	Industrial - Microturbine w/ Heat Recovery	0.0	0.0%	23.4	0.0	0.0
	Total RAP savings in 2021	**1.9**	**100.0%**	**400.0**	**7.4**	**2.9**

TRC Benefit-to-Cost Ratio in 2019	Commercial	Industrial
Fuel Cell w/ Heat Recovery	0.45	0.45
Recip Engine w/ Heat Recovery	0.68	0.72
CT w/ Heat Recovery	0.76	0.84
Microturbine w/ Heat Recovery	0.64	0.65
Steam Turbine w/ Heat Recovery	1.48	1.65

TRC Benefit-to-Cost Ratio in 2037	Commercial	Industrial
Fuel Cell w/ Heat Recovery	0.50	0.51
Recip Engine w/ Heat Recovery	0.78	0.85
CT w/ Heat Recovery	0.83	0.93
Microturbine w/ Heat Recovery	0.75	0.76
Steam Turbine w/ Heat Recovery	1.65	1.84

- Only Steam Turbines with Heat Recovery are cost effective for the entire study.
- Installed Steam Turbine cost is lower than other technologies since it is only for the Turbine itself. This assumes that the requisite Steam Boiler is already installed onsite, which is typically the case for these installations.

HIGH LEVEL RESULTS – ENERGY

Commercial Electric Summary – Opt-Out Removed from MAP and RAP

	2019	2020	2021	2030	2037
Baseline Forecast (GWh)	**8,790**	**8,795**	**8,816**	**9,489**	**10,258**
Cumulative Savings (GWh)					
Realistic Achievable Potential	0.1	0.3	0.4	1.7	2.9
Maximum Achievable Potential	0.2	0.4	0.6	2.6	4.3
Economic Potential	0.4	0.9	1.3	5.4	8.5
Technical Potential	54.4	108.9	163.3	653.3	1,034.3
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Achievable Potential	0.0%	0.0%	0.0%	0.0%	0.0%
Economic Potential	0.0%	0.0%	0.0%	0.1%	0.1%
Technical Potential	0.6%	1.2%	1.9%	6.9%	10.1%

Industrial Electric Summary – Opt-Out Removed from MAP and RAP

	2019	2020	2021	2030	2037
Baseline Forecast (GWh)	**5,352**	**5,354**	**5,349**	**5,404**	**5,566**
Cumulative Savings (GWh)					
Realistic Achievable Potential	0.5	1.0	1.5	6.4	10.7
Maximum Achievable Potential	0.8	1.5	2.3	9.6	15.7
Economic Potential	2.0	4.0	6.1	24.2	38.4
Technical Potential	78.9	157.8	236.7	946.7	1,498.9
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.0%	0.0%	0.0%	0.1%	0.2%
Maximum Achievable Potential	0.0%	0.0%	0.0%	0.2%	0.3%
Economic Potential	0.0%	0.1%	0.1%	0.4%	0.7%
Technical Potential	1.5%	2.9%	4.4%	17.5%	26.9%

HIGH LEVEL RESULTS – SUMMER PEAK DEMAND

Commercial Electric Summary – Opt-Out Removed from MAP and RAP

	2019	2020	2021	2030	2037
Baseline Forecast (MW)	1,568	1,568	1,570	1,651	1,748
Cumulative Savings (MW)					
Realistic Achievable Potential	0.0	0.0	0.0	0.2	0.3
Maximum Achievable Potential	0.0	0.0	0.1	0.3	0.5
Economic Potential	0.1	0.1	0.2	0.6	1.0
Technical Potential	6.0	11.9	17.9	71.4	113.1
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Achievable Potential	0.0%	0.0%	0.0%	0.0%	0.0%
Economic Potential	0.0%	0.0%	0.0%	0.0%	0.1%
Technical Potential	0.4%	0.8%	1.1%	4.3%	6.5%

Industrial Electric Summary – Opt-Out Removed from MAP and RAP

	2019	2020	2021	2030	2037
Baseline Forecast (MW)	953	953	952	960	987
Cumulative Savings (MW)					
Realistic Achievable Potential	0.1	0.1	0.2	0.7	1.2
Maximum Achievable Potential	0.1	0.2	0.3	1.1	1.8
Economic Potential	0.2	0.5	0.7	2.8	4.4
Technical Potential	9.4	18.7	28.1	112.4	177.9
Energy Savings (% of Baseline)					
Realistic Achievable Potential	0.0%	0.0%	0.0%	0.1%	0.1%
Maximum Achievable Potential	0.0%	0.0%	0.0%	0.1%	0.2%
Economic Potential	0.0%	0.0%	0.1%	0.3%	0.4%
Technical Potential	1.0%	2.0%	3.0%	11.7%	18.0%

NEXT STEPS: PROGRAM POTENTIAL & IRP INPUTS

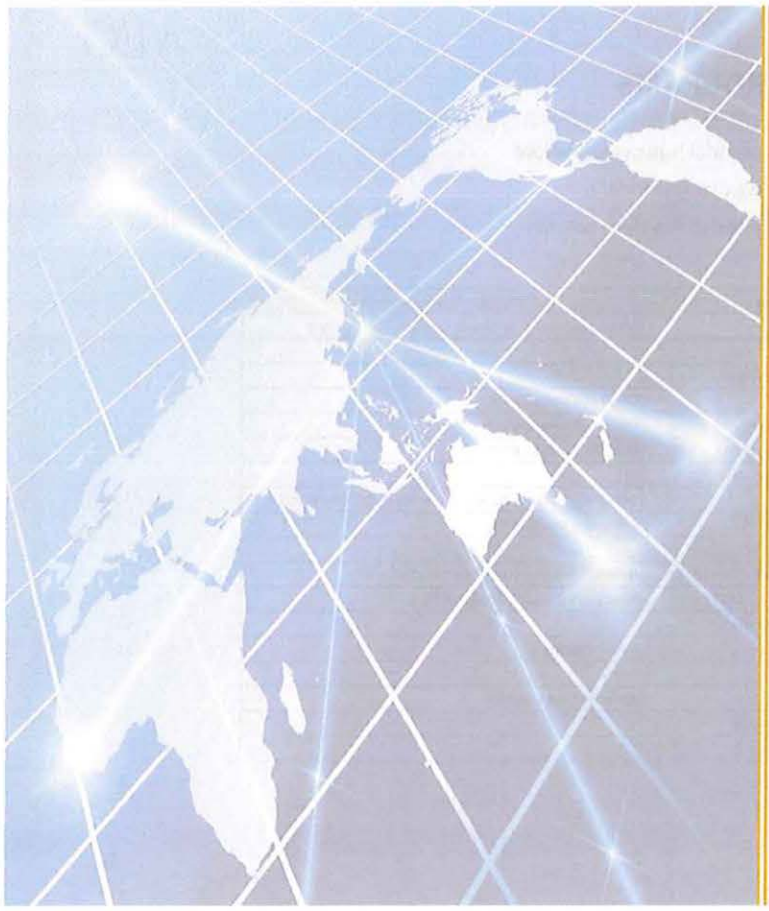
PRELIMINARY LIST OF PROGRAMS

- The preliminary list for program potential is provided below
- The basic structure is similar to the existing portfolio
- Notable enhancements are highlighted in the third column

Sector	Program	Notable Enhancements
Residential	Home Lighting Rebate	Break out general service & specialty for planning
Residential	Home Energy Report	
Residential	Income-Eligible Home Energy Report	
Residential	Whole House Efficiency	Enhanced measure list
Residential	Income-Eligible Multi-Family	Enhanced measure list
Residential	Income-Eligible Weatherization	Enhanced measure list
Residential	Residential Smart Thermostats	
Residential	Direct Load Control	New Program with AC and Water Heating DLC Switches
Business	Business Rebate - Standard	Enhanced measure list
Business	Business Rebate - Custom	
Business	Business Rebate - Custom: Data Center	New Sub Program targeting Data Centers
Business	Business Rebate - Custom: CHP	New Sub Program targeting CHP
Business	Strategic Energy Management	
Business	Retrocommissioning	New Program
Business	Block Bidding	
Business	Small Business Direct Install	Enhanced measure list
Business	Business Smart Thermostats	
Business	Demand Response Incentive	

DEVELOPING PROGRAM POTENTIAL

- AEG will consolidate RAP and MAP from the various component analyses into Program Potential, which will receive Program Design analysis and treatment in the next stage of the project.
- Program Potentials will eventually feed into filings and IRP.
- We plan to combine all resource categories into a single portfolio and condition for the IRP analysis is 8 permutations:
  - 2 Separate holding companies: KCPL (KS and MO) and GMO (MPS and SJLP)
  - 4 Levels of participation or spending:
    - 0.5X RAP
    - RAP
    - Average of RAP and MAP
    - MAP



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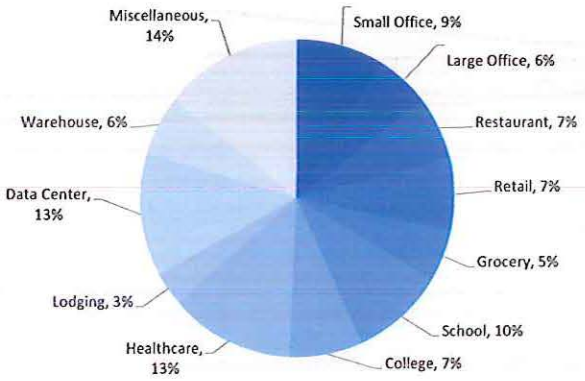
SUPPLEMENTAL SLIDES - EE

COMMERCIAL MARKET PROFILE – ELECTRICITY

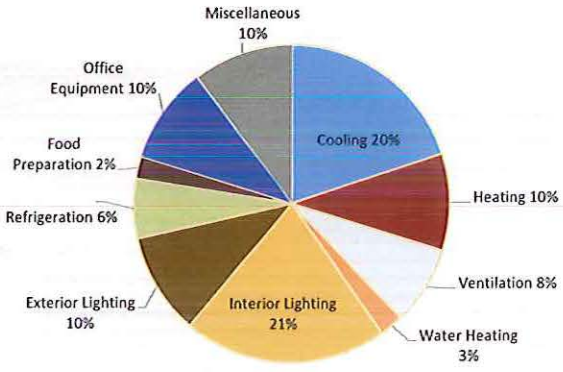
Segment	Electricity Sales (GWh)	% of Total Usage	Avg. Use / Square Foot (kWh/SqFt)	Summer Peak Demand (MW)	Winter Peak Demand (MW)
Small Office	778	8.9%	13.1	102	143
Large Office	488	5.6%	14.5	64	76
Restaurant	576	6.6%	38.6	80	81
Retail	638	7.3%	12.8	105	96
Grocery	470	5.4%	54.8	60	49
School	842	9.6%	12.8	297	92
College	646	7.4%	17.5	116	110
Healthcare	1,138	13.0%	20.4	132	239
Lodging	298	3.4%	17.2	30	36
Data Center	1,103	12.6%	112.7	160	152
Warehouse	529	6.0%	9.7	216	73
Miscellaneous	1,253	14.3%	7.5	218	238
Total	**8,760**	**100.0%**	**15.3**	**1,578**	**1,384**

COMMERCIAL MARKET PROFILE – ELECTRICITY

Commercial Electric Use by Segment, 2015



Commercial Electricity Use by End Use, 2015

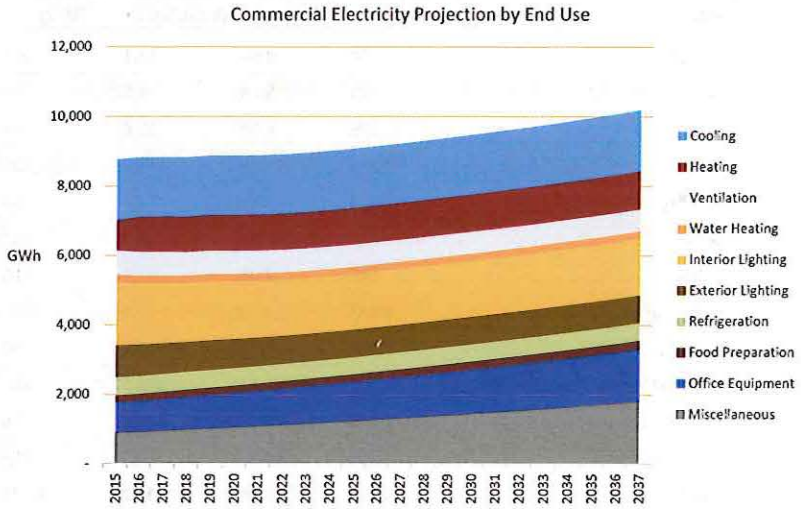


Sources: KCP&L 2016 Commercial Customer Survey, KCP&L Billing data, AEG Energy Market Profiles

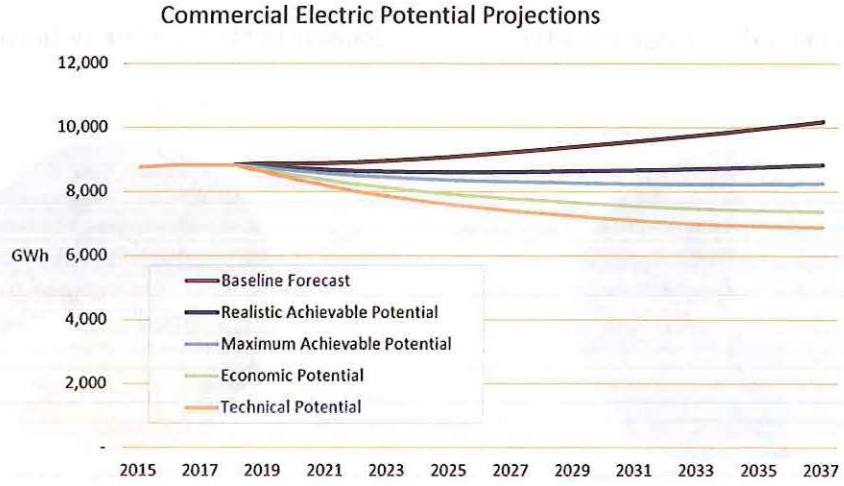
COMMERCIAL BASELINE PROJECTION

BY END USE

- Baseline projection includes the effects of appliance standards, EISA, and naturally occurring efficiency
- Baseline projection shows load growth of 16.1% by 2037
- Average annual growth of 0.68%



COMMERCIAL BASELINE AND POTENTIAL PROJECTIONS

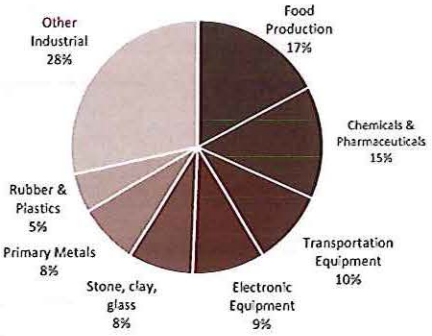


- Note: Potential from MO Opt Out customers has been removed from the Realistic and Maximum Achievable cases
- Penalties were applied to the take rates for each segment, representing customers opting out

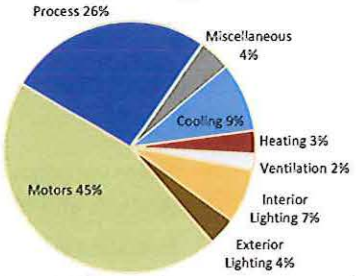
Industrial Market Profile – Electricity

Segment	Electric Sales (GWh)	% of Total Usage	Summer Peak Demand (MW)	Winter Peak Demand (MW)
Food Production	894	17%	128	146
Chemicals & Pharmaceuticals	755	14%	106	122
Transportation Equipment	498	10%	120	70
Electronic Equipment	484	9%	120	73
Stone, clay, glass	428	8%	57	70
Primary Metals	405	8%	48	68
Rubber & Plastics	262	5%	41	42
Other Industrial	1,482	28%	318	231
Total	**5,208**	**100%**	**938**	**823**

Industrial Electricity Use by Segment, 2015



Industrial Electricity Use by End Use, 2015



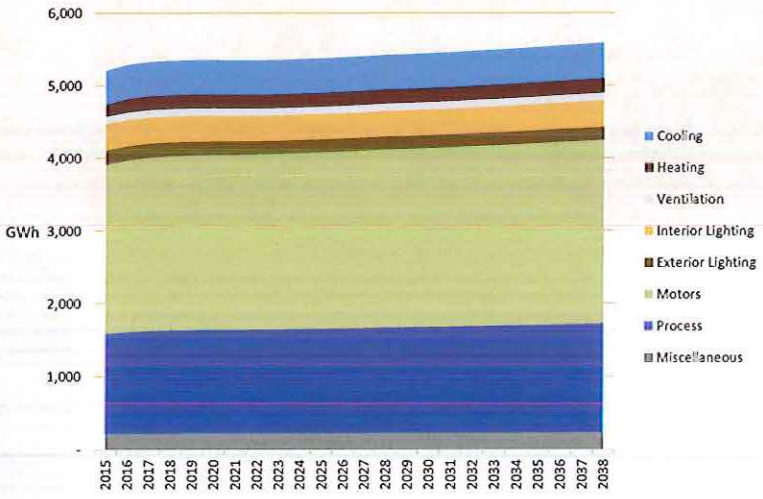
Sources: KCP&L 2016 C&I Customer Survey, KCP&L Billing data, AEG Energy Market Profiles

Industrial Baseline Projection

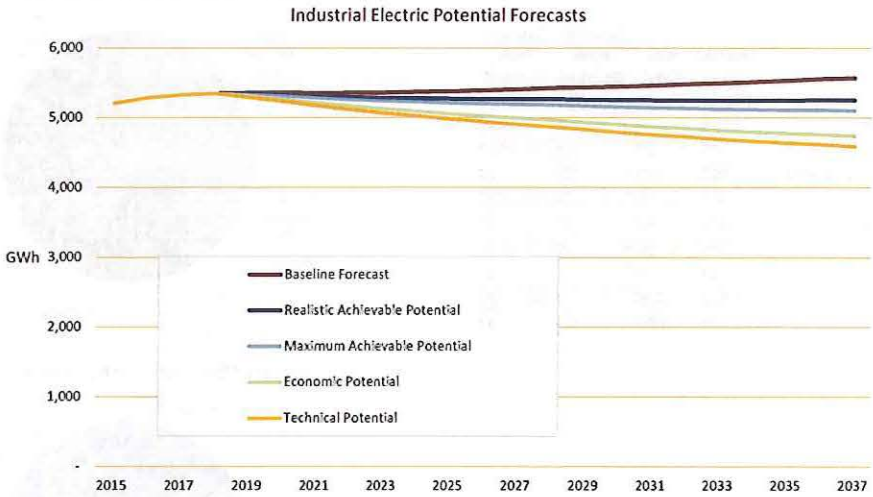
By end use

- Baseline projection includes the effects of equipment standards like NEMA premium motors, naturally occurring efficiency, and customer growth rates
- Baseline projection shows load growth of 6.9% by 2037
- Average annual growth of 0.3%

Industrial Electricity Forecast by End Use



INDUSTRIAL BASELINE AND POTENTIAL PROJECTIONS

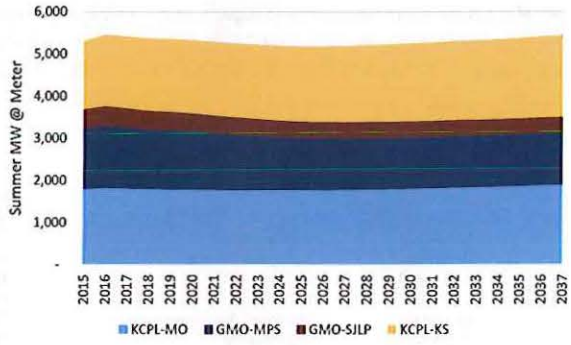


- Note: Potential from MO Opt Out customers has been removed from the Realistic and Maximum Achievable cases
- Penalties were applied to the take rates for each segment, representing customers opting out

SUPPLEMENTAL SLIDES – DR & DSR

SUMMER PEAK DEMAND BASELINE PROJECTION

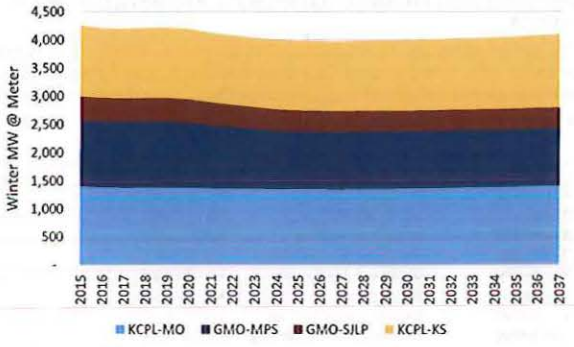
- AEG received 2015-2037 peak demand forecasts from KCP&L.
- The total system peak was allocated into the market segments based on customer counts and billing data for both customer energy and demand.



	2015	2018	2019	2020	2027	2037
KCP&L-MO	1,802	1,795	1,791	1,783	1,786	1,903
GMO-MPS	1,430	1,394	1,370	1,337	1,213	1,214
GMO-SJLP	447	431	423	414	378	376
KCP&L-KS	1,623	1,727	1,737	1,742	1,807	1,930
Total	**5,302**	**5,347**	**5,321**	**5,276**	**5,183**	**5,423**

WINTER PEAK DEMAND BASELINE PROJECTION

- AEG received 2015-2037 peak demand forecasts from KCP&L
- The total system peak was allocated into the market segments based on customer counts and billing data for both customer energy and demand.



	2015	2018	2019	2020	2027	2037
KCP&L-MO	1,411	1,389	1,387	1,376	1,357	1,415
GMO-MPS	1,156	1,161	1,142	1,109	1,006	1,007
GMO-SJLP	423	416	412	403	368	368
KCP&L-KS	1,260	1,248	1,250	1,235	1,239	1,298
Total	**4,250**	**4,214**	**4,192**	**4,123**	**3,971**	**4,088**

Program Participation Assumptions

- The participation rates estimate the percent of eligible customers who take part in a given program in a given year.
  - *Note that a customer is not considered eligible if they don't have the relevant equipment or are already participating in a mutually exclusive program. See previous slide on participation hierarchy.*
- Existing programs (DLC Smart Thermostat and Curtailment Agreements) are calibrated in year 1 to current performance.
- The remaining programs were developed by researching DR programs at utilities similar to KCP&L in size and region, then normalizing for KCP&L.
- All new programs have a 5 year ramp up period, except for IBR

Option	Program	Steady State Participation Rate	
		RAP	MAP
Residential	DLC Central AC	7.0%	8.0%
Residential	DLC Space Heating	15.0%	22.5%
Residential	DLC Water Heating	15.0%	22.5%
Residential	DLC Smart Thermostats	18.0%	22.0%
Residential	DLC Smart Appliances	5.0%	7.5%
Residential	DLC Room AC	15.0%	22.5%
Residential	Battery Energy Storage	1.0%	1.5%
Residential	DLC Elec Vehicle Charging	20.0%	30.0%
Residential	Time-Of-Use	28.0%	85.0%
Residential	Time-Of-Use w EV	85.0%	100%
Residential	Demand Rate	28.0%	85.0%
Residential	Demand Rate w EV	84.0%	100.0%
Residential	Inclining Block Rate	100.0%	100.0%
Small C&I	DLC Central AC	3.0%	4.5%
Small C&I	DLC Space Heating	3.0%	30.0%
Small C&I	DLC Water Heating	3.0%	4.5%
Small C&I	DLC Smart Thermostats	5.0%	7.5%
Small C&I	Ice Energy Storage	1.5%	2.3%
Small C&I	Battery Energy Storage	1.0%	3.0%
Small C&I	Time-Of-Use	13.0%	74.0%
Small C&I	Real Time Pricing	18.0%	31.0%
Large C&I	Curtail Agreements	20.0%	30.0%
Large C&I	Battery Energy Storage	1.0%	3.0%
Large C&I	Time-Of-Use	13.0%	74.0%
Large C&I	Real Time Pricing	18.0%	31.0%

Per-Unit Load Reduction Assumptions

- Existing program impacts are sourced from the 2016-2018 KCP&L MEEIA and KEEIA plan filings (DLC Smart Thermostat and Curtailment Agreements). Remaining program impacts were developed through secondary research
- Program impacts are equivalent across service territories and in both RAP & MAP scenarios, except as noted in italics for TOU and Demand Rate where impacts vary between RAP and MAP to reflect the difference between the highly-engaged volunteer population in the opt-in scenario (RAP) and the larger, more "average" population in the opt-out scenario (MAP).

Customer Class	Option	Unit	Summer Peak Impact	Winter Peak Impact
Residential	DLC Space Cooling	kW @meter	1.26	-
Residential	DLC Space Heating	kW @meter	-	1.65
Residential	DLC Water Heating	kW @meter	0.58	0.58
Residential	DLC Smart Thermostats	kW @meter	1.26	0.70
Residential	DLC Smart Appliances	kW @meter	0.14	0.14
Residential	DLC Room AC	kW @meter	0.47	-
Residential	Battery Energy Storage	kW @meter	2.00	2.00
Residential	DLC Elec Vehicle Charging	kW @meter	0.92	0.92
Residential	*Time-Of-Use*	*% customer peak @meter (MAP)*	*6.7%*	*6.1%*
Residential	*Time-Of-Use*	*% customer peak @meter (RAP)*	*10.9%*	*10.1%*
Residential	Time-Of-Us w EV	kW @meter	1.80	1.67
Residential	*Demand Rate*	*% customer peak @meter (MAP)*	*6.7%*	*7.8%*
Residential	*Demand Rate*	*% customer peak @meter (RAP)*	*11.1%*	*13.0%*
Residential	Demand Rate w EV	kW @meter	1.81	2.07
Residential	Inclining Block Rate	% customer peak @meter	1.3%	0.8%
Small C&I	DLC Space Cooling	kW @meter	1.51	-
Small C&I	DLC Space Heating	kW @meter	-	1.98
Small C&I	DLC Water Heating	kW @meter	0.70	0.70
Small C&I	DLC Smart Thermostats	kW @meter	1.51	0.78
Small C&I	Ice Energy Storage	kW @meter	5.00	0.00
Small C&I	Battery Energy Storage	kW @meter	2.00	2.00
Small C&I	Time-Of-Use	% customer peak @meter	0.4%	0.4%
Small C&I	Real Time Pricing	% customer peak @meter	0.7%	0.7%
Large C&I	Curtail Agreements	% customer peak @meter	21.0%	21.0%
Large C&I	Battery Energy Storage	kW @meter	15.00	15.00
Large C&I	Time-Of-Use	% customer peak @meter	4.4%	4.4%
Large C&I	Real Time Pricing	% customer peak @meter	9.5%	9.5%

Per-Unit Load Reduction Detail – Residential DS Rates

- Brattle relied on the PRISM model to estimate residential rate impacts for each rate design. In the cases of residential demand charges and time-of-use energy charges, Brattle estimated the expected impact for each of an opt-in and an opt-out scenario. It is assumed that if implemented, the IBR rate would be mandatory.

	Residential Demand Charge (Opt-In)	Time of Use Energy Charge (Opt-In)	Inclining Block Rate
Average change in peak demand - summer	-11.13%	-10.91%	-1.26%
Average change in peak demand - winter	-12.97%	-10.13%	-0.83%
Average change in peak demand - all months	-12.06%	-10.52%	-1.02%
Average change in energy consumption - all months	0.02%	0.02%	-1.02%
	Residential Demand Charge (Opt-Out)	**Time of Use Energy Charge (Opt-Out)**	
Average change in peak demand - summer	-6.68%	-6.55%	
Average change in peak demand - winter	-7.78%	-6.08%	
Average change in peak demand - all months	-7.23%	-6.31%	
Average change in energy consumption - all months	0.73%	0.64%	

Notes:
Summer is defined here as June 1 through September 30.
Results are modeled using PRISM coefficients for Zone 4.
RDC and TOU impacts are predicted for both an opt-in and opt-out scenario. In the opt-out scenario, a derate factor of 40% is applied.
The IBR model does not differentiate behavioral responses by time of day. Therefore the predicted percent impact on peak demand is set equal to the predicted percent impact on energy consumption. Summer peak impacts are calculated as the predicted impact on summer energy consumption.

Per-Unit Load Reduction Detail – Non-Residential DS Rates

- Using the Arc of Price Responsiveness model, Brattle estimated rate impacts for a Time-of-Use Energy Charge and a Real Time Energy Pricing rate for commercial and industrial customers.

	Time of Use Energy Charge	Real Time Energy Pricing
Small Commercial	0.35%	0.74%
Medium and Large Commercial	4.35%	9.48%
Industrial	5.03%	10.87%

Notes:
Time of use impacts are estimated based on a peak-to-off-peak ratio of 3:1.
Real time pricing impacts are estimated based on a highest-to-lowest intraday price ratio of 10:1.

BRATTLE DEVELOPMENT OF RESIDENTIAL RATE DESIGNS

- Brattle designed revenue-neutral rates for the residential options as outlined in the table below.

	Current Pricing	Demand Charge Pricing	Time of Use Pricing	Inclining Block Rate
Customer Charge ($/month)	$11.88	$11.88	$11.88	$21.88
Volumetric Charge ($/kWh)				
Tier 1				
Summer	$0.13	$0.10		$0.12
Winter	$0.12	$0.06		$0.07
Tier 2				
Summer	$0.13	$0.10		$0.14
Winter	$0.07	$0.06		$0.09
Tier 3				
Summer	$0.13	$0.10		
Winter	$0.06	$0.06		
Peak (4PM - 8PM)				
Summer			$0.36	
Winter			$0.22	
Off-Peak				
Summer			$0.12	
Winter			$0.07	
Super Off-Peak (12AM - 6AM)				
Summer			$0.06	
Winter			$0.04	
Demand Charge ($/kW)				
Summer		$8.00		
Winter		$4.95		

BRATTLE DEVELOPMENT OF RESIDENTIAL RATE DESIGNS (CONTINUED)

Notes:

For seasonal rate structures, summer rates apply to usage between June 1 and September 30.

The peak period is from 4PM to 8PM on weekdays, excluding federal holidays.

Demand is measured as maximum 15-minute demand during peak hours.

The summer-to-winter price ratio, 1.6 to 1, is the ratio of the current summer volumetric price per kWh to the weighted average winter volumetric price.

Under the current rate, Tier 1 usage includes any usage between 0 and 600 kWh per month, Tier 2 includes any additional usage under 1,000 kWh per month, and Tier 3 includes any usage above Tier 2. Under the studied IBR rates, Tier 1 includes any usage between 0 and 500 kWh per month, and Tier 2 includes any additional usage. In the unweighted sample, 2% of customers never exceed the upper limit of Tier 1, and 63% of customers exceed the upper limit of Tier 1 in every month.

For revenue neutrality calculations, the sample is weighted using strata weights for KCPL-MO.

[1]: Current KCP&L Missouri residential general use rates.

[2]: The summer demand charge is set at $8.00. Both the demand and volumetric charges are set to a summer-to-winter ratio of 1.6 to 1. The volumetric charges are calculated to achieve revenue neutrality with current rates.

[3]: Volumetric charges for the TOU tariff are calculated to maintain revenue neutrality with current rates while maintaining a peak-to-off-peak price ratio of 3 to 1, a super-off-peak-to-off-peak ratio of 0.5 to 1, and a summer-to-winter ratio of 1.6 to 1.

[4]: The fixed charge is increased to $21.88. Volumetric charges for the IBR tariff are calculated to maintain revenue neutrality with current rates while maintaining a price ratio of 1.2 to 1 for tier 2 to tier 1, and a summer-to-winter price ratio of 1.6 to 1.

- Note: Brattle also modeled the impact of non-residential designed rates for the non-residential options as outlined above. The model depends on the rates' price ratios but not the price levels. For this reason Brattle did not need to design specific non-residential rates to develop the per-unit impact assumptions.

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SUPPLEMENTAL SLIDES – CHP

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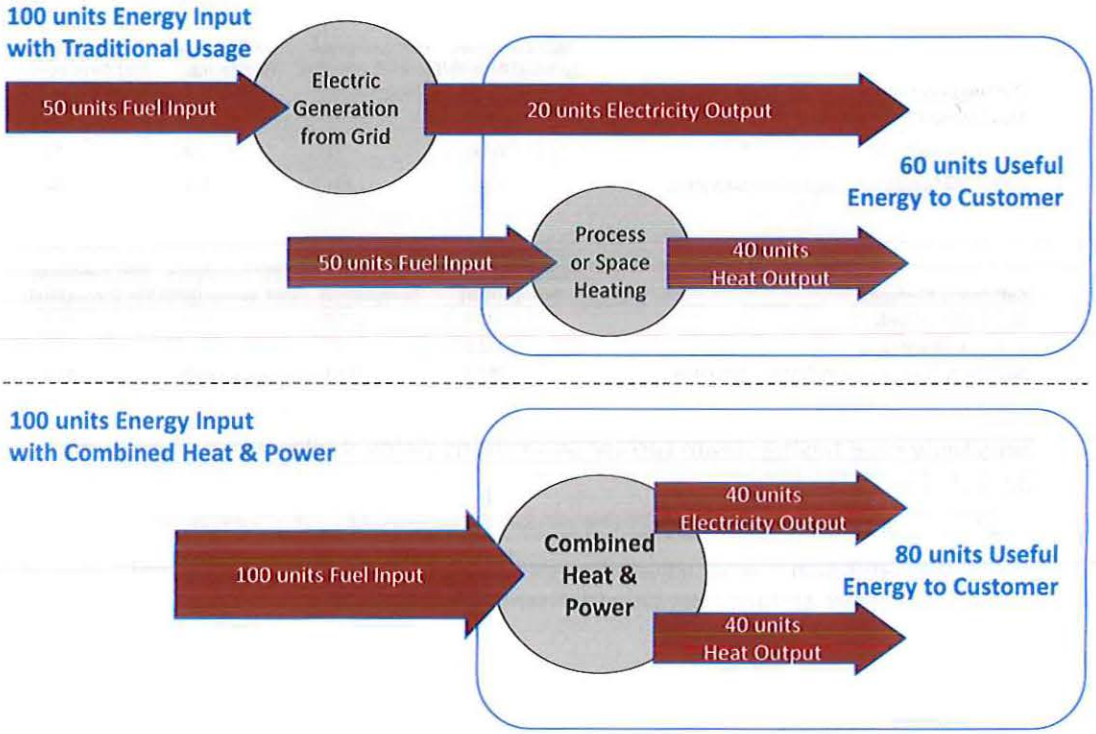
REVIEW OF CHP ENERGY FLOWS



COMPARISON TO 2013 STUDY

- CHP Analysis in 2013 Potential Study:
  - In the 2013 study, only steam turbines passed TRC screening for small to medium systems
  - Both steam and combustion turbines passed for large systems
  - Analysis assumed that steam turbines were fungible and used for all customers, but steam turbines require that a steam boiler is already in use at the site, so this may not be appropriate in some or most of those cases.
  - 20-year Cumulative Economic Potential of **1,303 GWh energy** and **178 MW demand**
- Current CHP Analysis:
  - Only assumed Steam Turbines applicable in small subset of facilities where steam boiler or appropriate steam source already available.
  - No other technologies cost-effective
  - 20-year Cumulative Economic Potential of **47 GWh energy** and **5 MW demand**
- Sensitivity on Current CHP Analysis – (High Steam Turbine Saturation)
  - We ran a sensitivity case were we also allowed steam turbines to be applicable in all customer sites. The results were much closer to the 2013 analysis.
  - 20-year Cumulative Economic Potential of **1,257 GWh energy** and **143 MW demand**

COMPARISON TO 2013 STUDY, CONT.

CHP Energy Potential	2037 Cumulative Technical Potential Savings (GWh)	2037 Cumulative Economic Potential Savings (GWh)	2037 Cumulative MAP Savings (GWh)	2037 Cumulative RAP Savings (GWh)
2013 Potential Study	N/A	1,303	651	430
2016 Potential Study	2,533	47	20	14
2016 Study Sensitivity w/ High Steam Saturation	2,533	1,257	531	360

CHP Demand Potential	2037 Cumulative Technical Potential Savings (MW)	2037 Cumulative Economic Potential Savings (MW)	2037 Cumulative MAP Savings (MW)	2037 Cumulative RAP Savings (MW)
2013 Potential Study	N/A	177.8	88.9	58.7
2016 Potential Study	291.0	5.3	2.3	1.5
2016 Study Sensitivity w/ High Steam Saturation	291.0	143.4	60.6	41.0

- Sensitivity case raising steam turbine saturations yields similar levels of economic potential to 2013 study
  - Differences still exist because of revised system efficiency and peak load factors
  - Note that saturation was not adjusted in small commercial segments, and fuel cell installations were omitted from saturation sensitivity adjustment.