Memorandum

To:	Natelle Dietrich, MPSC; Brenda Wilbers, MDNR
From:	Tom Franks
Copy:	Fred Coito & Kristina Kelly, KEMA; Gwen Mizell, GSM Development
Date:	January 5, 2011
Subject:	Questions on technical and economic potential, dated 12/21/10

We have reviewed the questions and provide our responses below and in the attached documents.

Question 1 – Does KEMA have any concerns about the large variances between the KEMA and Ameren Missouri technical and economic potential data in the attachment? Please explain the large variances highlighted in green.

We reviewed the assumptions underlying our analysis and discovered that the most significant source of the variance between Ameren's results and KEMA's results due to a difference in the commercial sector baseline. As you recall, we did not have complete data set to determine the statewide baseline inputs, which were submitted in a memo for PSC and stakeholder review on October 4, 2010. We developed these inputs by scaling the available information to the sector and end-use level then calibrating the total results to equal the total statewide energy. In our review, we discovered a error in the calibration process. The pie charts below show three end-use baseline energy usage breakouts for the commercial sector. The first is KEMA's original breakout, the second is the breakout from the Ameren Missouri study, and the third is KEMA's revised baseline.

Figure 1 - KEMA - version 1 - Commercial Energy Consumption by End-Use

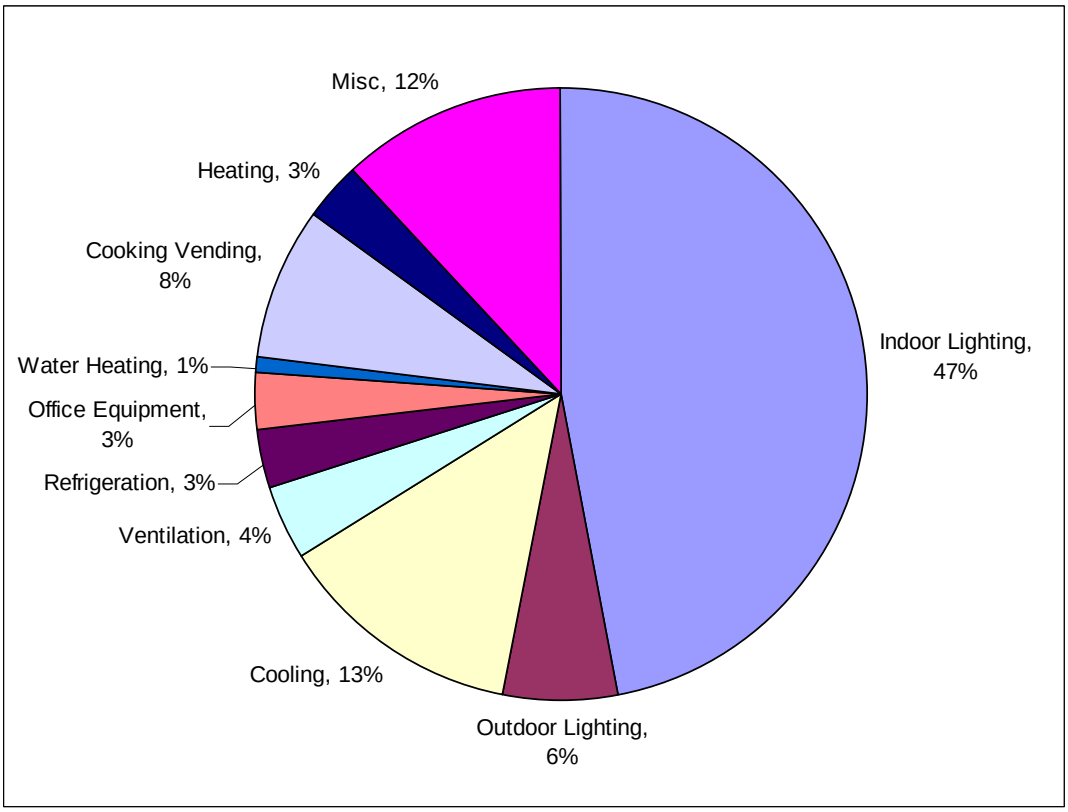
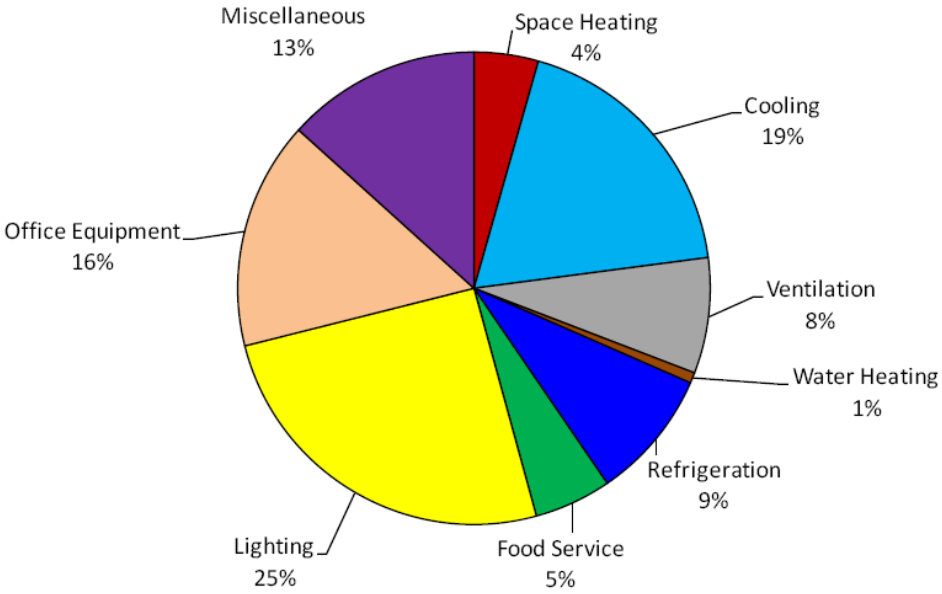


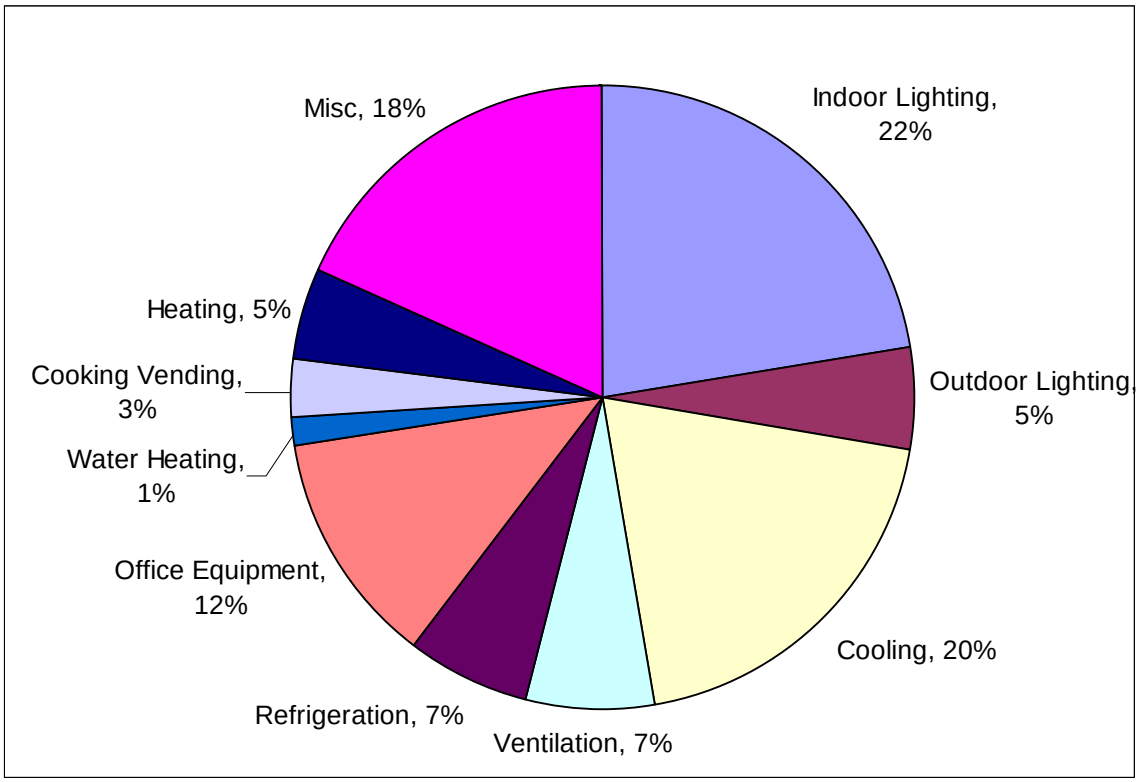
Figure 2 – Ameren Missouri

Figure 3-7 Commercial Electricity Consumption by End Use, 2008



The difference in lighting end-use, 25% in Ameren's study and 49% KEMA's first version, is the most significant difference. To address this difference, we have recalibrated our baseline inputs and developed the following end-use allocation for the commercial sector.

Figure 3 - KEMA Revised - Commercial Energy Consumption by End-Use



As result of this revision, it was necessary to recalibrate the peak usage numbers. This recalibration required that all sector baselines be adjusted. We have rerun the model to produce revised estimates of the technical and economic potential for these all sectors. In light of the tight schedule, we have begun the estimation of achievable potential prior to submitting the revisions noted. We will present the revised baseline inputs and revised technical and economic potential results in the draft report.

The tables below are in the same format as those prepared by PSC staff Staff) and forwarded on Decemeber 21, 2010. Staff's analysis was based on a percentage of economic potential. We also present a comparison of the Ameren Missouri results and our revised estimate relative to base energy use by end-use, a metric we often find relevant. The change in the commercial lighting baseline, since this end-use is typically associated with a relatively large potential for economic savings, is the primary cause for the change in potential for that sector.

Energy Economic Potential (End Uses and Total) by Customer Class

Residential	Ameren MO	KEMA v1	KEMA v1 to AMEREN MO Variance	KEMA v1 to AMEREN MO % Variance	KEMA v2	KEMA v2 to AMEREN MO Variance	KEMA v2 to AMEREN MO % Variance
Lighting	19%	23%	4%	21%	25%	6%	33%
Water heating	20%	3%	-17%	-85%	6%	-14%	-69%
Cooling	13%	40%	27%	208%	28%	15%	115%
Space heating	8%	15%	7%	88%	25%	17%	209%
Appliances and electronics	35%	10%	-25%	-71%	9%	-26%	-74%
Miscellaneous	5%	9%	4%	80%	7%	2%	35%
Total End Uses	100%	100%					
Total Energy Economic Potential	14%	30%	16%	114%	32%	18%	127%

Commercial	Ameren MO	KEMA v1	KEMA v1 to AMEREN MO Variance	KEMA v1 to AMEREN MO % Variance	KEMA v2	KEMA v2 to AMEREN MO Variance	KEMA v2 to AMEREN MO % Variance
Lighting	38%	78%	41%	108%	37%	0%	0%
Cooling	30%	5%	-25%	-83%	40%	10%	34%
Refrigeration	9%	2%	-7%	-76%	9%	0%	5%
Space heating	1%	0%	-1%	-100%	0%	-1%	-100%
Other	23%	15%	-8%	-35%	14%	-9%	-39%
Total End Uses	100%	100%			100%		
Total Energy Economic Potential	17%	36%	19%	112%	27%	10%	56%

Industrial	Ameren MO	KEMA v1	KEMA v1 to AMEREN MO Variance	KEMA v1 to AMEREN MO % Variance	KEMA v2	KEMA v2 to AMEREN MO Variance	KEMA v2 to AMEREN MO % Variance
Machine drive	53%	78%	25%	47%	78%	25%	48%
Cooling	14%	5%	-9%	-64%	4%	-10%	-70%
Lighting	26%	6%	-20%	-77%	6%	-20%	-78%
Process	7%	7%	0%	0%	12%	5%	66%
Other	0%	4%	4%	n/a	0%		
Total End Uses	100%	100%			100%		
Total Energy Economic Potential	8%	14%	6%	75%	15%	7%	86%

Sources of data:
KEMA: Pages 13 - 17 of KEMA's December 13, 2010 Memo to Natelle Dietrich and Brenda Wilbers
Ameren: Pages ES-29 - ES-31 of AmerenUE Demand Side Management (DSM) Market Potential Study

Comparison of Technical and Economic Potential by Customer Class

Percent of Economic Potential			KEMAv1 to AMEREN		KEMA v2	KEMAv2 to AMEREN	
Energy Technical Potential	Ameren MO	KEMA v1	Variance	% Variance		Variance	% Variance
Residential	37%	45%	8%	22%	48%	11%	30%
Commercial	31%	46%	15%	48%	38%	7%	22%
Industrial	11%	17%	6%	55%	18%	7%	62%
Total	28%	40%	12%	43%	38%	10%	36%

Other States Average Total = 28%

			KEMAv1 to AMEREN		KEMA v2	KEMAv2 to AMEREN	
Energy Economic Potential	Ameren MO	KEMA	Variance	% Variance		Variance	% Variance
Residential	14%	30%	16%	114%	32%	18%	127%
Commercial	17%	36%	19%	112%	27%	10%	56%
Industrial	8%	14%	6%	75%	15%	7%	86%
Total	14%	29%	15%	107%	27%	13%	89%

Other States Average Total = 20%

			KEMAv1 to AMEREN		KEMA v2	KEMAv2 to AMEREN	
Demand Technical Potential	Ameren MO	KEMA	Variance	% Variance		Variance	% Variance
Total	35%	40%	5%	14%	37%	2%	6%

			KEMAv1 to AMEREN		KEMA v2	KEMA v2 to AMEREN	
Demand Economic Potential	Ameren MO	KEMA	Variance	% Variance		Variance	% Variance
Total	17%	29%	12%	71%	27%	10%	59%

Other States Average Total from Table 3 on page 14 of August 2009 Energy Efficiency Resource Potential in the Midwest - A Review and Analysis of Existing Studies - by Energy Center of Wisconsin

Energy Economic Potential as % of Base Energy Use					
		Study Findings		KEMA v2 to AMEREN MO	
Sector	End-Use	Ameren MO	KEMA v2	Variance	% Variance
Residential	Lighting	54%	65%	11%	21%
	Water heating	62%	23%	-40%	-64%
	Cooling	17%	40%	23%	135%
	Space heating	11%	33%	22%	197%
	Appliances and electronics	25%	13%	-12%	-47%
	Miscellaneous	4%	21%	17%	399%
Residential Sector Total		**21%**	**32%**	11%	52%
Commercial	Lighting	27%	48%	21%	77%
	Cooling	29%	18%	-11%	-39%
	Refrigeration	17%	47%	29%	169%
	Space heating	5%	0%	-5%	-100%
	Other	10%	16%	6%	66%
Commercial Sector Total		**18%**	**27%**	8%	46%
Industrial	Machine drive	9%	21%	12%	132%
	Cooling	17%	9%	-8%	-48%
	Lighting	33%	15%	-18%	-54%
	Process	2%	6%	4%	182%
	Other	0%	0%	0%	NA
Industrial Sector Total		**9%**	**15%**	6%	75%

Question 2 - Is KEMA satisfied with the outcome of the high, base and low avoided cost scenarios for the economic potential analysis?

Yes. The analysis confirmed our estimation of the sensitivity of the potential to avoided costs.

Question 3 - When avoided costs increases by 50%, why does energy economic potential only increase by 7% (From a base energy economic potential of 29% to a high economic potential of 31%)?

Changes in avoided costs only affect the cost-effectiveness of those measures that have benefit cost ratios within a limited range on either side of one. There is not a direct correlation between the avoided costs and the number of measures that are cost effective or the savings those measures produce. For example, increasing the avoided costs by 50% only added measures to the economic potential that had benefit cost ratios in the range of 0.67 – 0.99 in the base avoided cost scenario, a relatively small number of measures.

Question 4 - Has KEMA ever experienced higher technical potentials and economic potentials than those in the Missouri study? When?

KEMA reviewed the technical and economic potential savings developed by our model, and in light of the relatively low past programming in Missouri and the PSC's draft rules for annual savings, found them within the range of reason.

Results from a recent study for a territory that has had aggressive energy efficiency efforts are compared to our results for Missouri in the table below.

Comparison of Recent Study Results			
Sector	Recent KEMA Study	KEMA Missouri v1	KEMA Missouri v2
Residential	28%	30%	32%
Commercial	28%	36%	27%
Industrial	16%	14%	15%