ICF COMMENTS ON KCP&L 2008 IRP

On August 5, 2008, the Kansas City Power and Light Company (KCP&L) filed its 2008 Integrated Resource Plan (IRP) with the Missouri Public Service Commission in Case No. EE-2008-0034. In late December KCP&L filed a Supplemental IRP to address issues raised in the technical conferences regarding the processes and evaluations in the 2008 IRP. The IRP states that under the Base Case load forecast, KCP&L will not need to add new capacity until 2020 in meeting the Southwest Power Pool (SPP) reserve margin requirement of 13.6% (equivalent to 12% capacity margin).

KCP&L's IRP analyzes a total of 26 planning scenarios. Under the selected Preferred Plan, in addition to Iatan 2, KCP&L will add wind capacity of 100 MW for each year between 2009 and 2012. Additionally, 154 MW combustion turbines (CTs) will be built in 2029. To accommodate the wind builds in the near term, KCP&L will reduce its sales to wholesale customers. The wind capacity contributes very little to reserve margin but is important to meet the recently passed state Renewable Policy Standard (RPS). KCP&L also considered several demand side (DSM) options as resources to meet required load. Comments on the DSM options are presented in a separate report.

Note that ICF has not performed any detailed modeling simulations of the KCPL and/or surrounding systems nor has it conducted a separate IRP study. ICF's comments are based solely on the information provided in the IRP report and response to data requests submitted by KCP&L. This review does not in any way, endorse the methodology, findings or conclusions presented in the IRP.

In general KCP&L's 2008 IRP and responses to data requests have provided detailed information on its IRP assumptions and modeling results. It also appears to have considered many critical issues in its planning process. ICF performed a review of both KCP&L 2008 IRP and the Supplemental IRP. We have compared the KCP&L IRP assumptions with information available from the public sources and ICF's view for its fundamental modeling.

The following is a summary of our review.

1. ***Peak Demand Forecast*** – The Base Case KCP&L peak demand for the forecast period of 2008-2030 is projected to grow at an average annual rate of 0.85 percent. This is a very low demand growth and is the single most important assumption in the analysis regarding the need for capacity over time. KCP&L assumes peak demand to growth at 1.7% in 2008 and 1% in 2015 and 0.7% by 2030. This projected growth rate is significantly lower than KCP&L's historical annual growth rate of 1.61 percent between 1998 and 2007 (Exhibit 1). It is also much lower than ICF forecast of [redacted] percent growth per year for 2010-2027 based on 10-year rolling average of historical peak demand in the SPP region (source: NERC ES&D). The underlying assumption for the lower peak demand growth is primarily based on the expected economic slowdown during the forecast period.

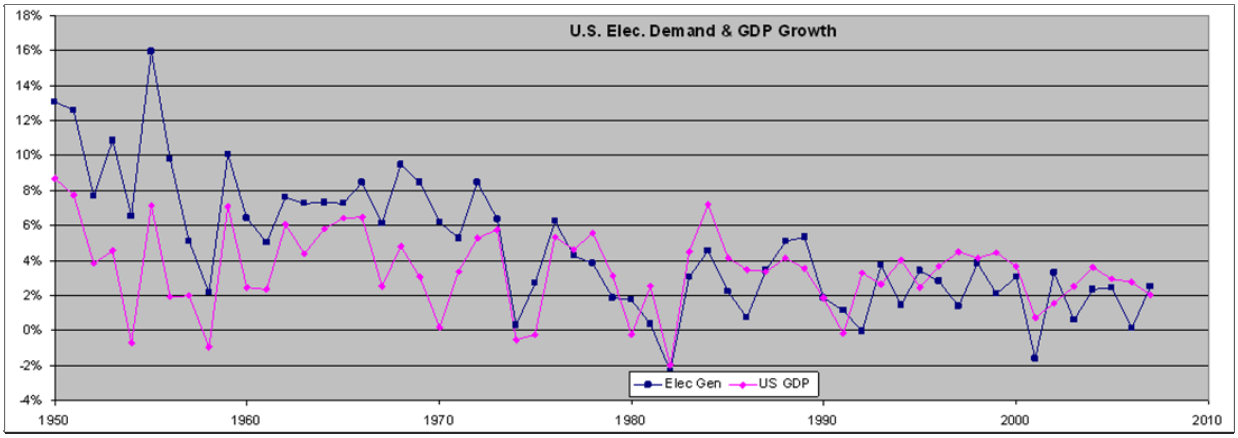
EXHIBIT 1
SPP/KCP&L Historical and Forecasted Peak and Energy Demand

Demand	Annual Average Growth Rate (%)				
	SPP Historical (1980-1990)	SPP Historical (1980-2006)	KCP&L Historical (1998-2007)	KCP&L IRP (2008-2030)	ICF SPP Forecast (2010-2027)
Peak	1.62%	1.80%	1.61%	0.85%	[redacted]
Energy	1.73%	1.91%	2.03%	1.30%	[redacted]

Source: NERC ES&D, KCP&L IRP, ICF.

ICF concurs that demand for electricity may decrease during periods of economic recession. However, demand should bounce back in the post recession period. This view is based on our analysis of the historical U.S. electricity demand versus GDP and also based on demand data reported by DOE EIA and Bureau of Economic Analysis (BEA). See Exhibits 2-4 below. After the 1980-1981 recession, U.S. electricity demand bounced back by 5% vs. GDP's 7% growth. In 1991, the bounce back in electricity demand was again the same although there was a year lag. Based on historical evidence, electricity demand will likely to bounce back after the current recession. The long term 20-year peak demand forecast is not expected to deviate much from the historical average annual growth rates.

EXHIBIT 2
U.S. ELECTRICITY DEMAND and GDP GROWTH



Source: The economic data is from the U.S. Bureau of Economic Analysis (BEA) and electricity generation data from Energy Information Administration (EIA).

EXHIBIT 3
HISTORICAL PEAK DEMAND GROWTH

Period	SPP	U.S.
1981-1982	-2.13%	-1.47%
1981-1985	0.08%	0.62%
1981-1990	1.62%	2.51%
1981-2000	2.15%	2.37%
1981-2007	1.83%	2.30%

Source: NERC ES&D

EXHIBIT 4
HISTORICAL ENERGY DEMAND GROWTH

Period	SPP	U.S.
1981-1982	-0.42%	-0.73%
1981-1985	1.50%	1.77%
1981-1990	1.73%	2.35%
1981-2000	2.26%	2.26%
1981-2007	1.96%	2.11%

Source: NERC ES&D

2. ***Retirements –*** The average age of KCP&L's existing generating assets is 23 years. More than half of KCP&L's existing generating capacity is 36 years or older (see Exhibit 5). Although the IRP discusses the KCP&L's Plant Life Assessment and Management Plan (LAMP) tests conducted by its engineering groups, no specific retirement of its powerplants was discussed. For resource planning, the LAMP results serve to identify high cost projects that may impact future retirement decisions. The generic coal retirement modeled in the IRP the LAMP costs were used. However, the results show the modeled unit will continue to operate in the forecast period. KCP&L's coal generating fleet averages 40 years of age. KCP&L should make plans for replacing the older plants when they retire.

EXHIBIT 5
KCP&L GENERATING ASSETS

Plant Name	Capacity (MW)	Capacity Type	Online Year	Age
Hawthorn	563	Coal	1969	40
Hawthorn CC	290	Gas - CC	1997	12
Hawthorn CT	130	Gas - CT	2000	9
Iatan	456	Coal	1980	29
La Cygne	711	Coal	1973	36
Montrose	510	Coal	1958	51
Northeast Station	458	Oil	1972	37
Northeast Station IC	2	Oil	1985	24
Osawatomie CT	77	Gas - CT	2003	6
Spearville	100	Wind	2006	3
West Gardner	308	Gas	2003	6
Wolf Creek	548	Nuclear	1985	24
Total/Average	**4,153**			23

Source: SNL

3. ***CO_2 Price Forecast*** – KCP&L's CO_2 allowance price forecast averages at $[redacted]/ton (levelized at 7 percent for the 2012 – 2030 period). This assumption appears to be in the reasonable range. This forecast is not too different from the most recent ICF forecasts of CO_2 allowance prices. KCP&L is dominated by coal-fired capacity. Only 13 percent of its capacity is CC. The average age of the coal plants is 40 years old, quickly approaching retirement age. There is a greater need for replacement capacity when older plants are retired. KCP&L should consider diversify into natural gas-fired CC.

4. ***EIS and SPP Developments –*** This is the first IRP in the aftermath of the creation of the EIS market. However, there was no discussion of the impact of the market by KCP&L on how it affected operations of the potential for interchange and purchasing. No discussion of the effects on KCP&L generation and the ability to rely on other source.

5. ***Capital Costs for New Units*** – As shown below in Exhibit 6, KCP&L assumes higher capital costs for wind power plants than coal power plants ($[redacted]/kW vs. $[redacted]/kW). We believe KCP&L's IRP may have underestimated the coal plant capital costs. KCP&L also assumes that Production Tax Credits (PTC) are available at over $[redacted]/MWh (see page 29 of KCP&L Supplemental IRP Volume1-S). KCP&L overstates the PTC assumption as we observe $21/MWh PTC for wind projects.. Our information is based on the Database of State Incentives for Renewables & Efficiency of the North Carolina State University (DSIRE) (Source: http://www.dsireusa.org/library/includes/GenericIncentive.cfm?Incentive_Code=US13F&currentpageid=3&EE=1&RE=1). These factors highly influence the economics of wind power as the preferred choice in KCP&L's IRP. Its CC capital cost appears to be low compared to ICF for new plant. If KCP&L believes that CC is less expensive and the gas price assumption is low, KCP&L should consider the CC options. Exhibit 6 presents a comparison of KCP&L capital costs with ICF assumptions.

Exhibit 6
New Build Capital Costs (2008$/kW)

Technology	KCP&L Base	ICF	Delta (ICF-KCP&L)	Delta (ICF-KCP&L)/ICF
Combined Cycle	[redacted]	[redacted]	[redacted]	[redacted]
Combustion Turbine	[redacted]	[redacted]	[redacted]	[redacted]
SCPC PRB	[redacted]	[redacted]	[redacted]	[redacted]

Source: ICF, KCP&L IRP.
Note: KCP&L escalate their capital costs at an annual rate of 2.5%.

6. ***RFP*** – KCP&L did issue an RFP on August 17, 2007 for purchase power agreements (PPAs) which is good. In the IRP, KCP&L discusses the 2007 RFP proposal results and concludes that the timing of RFP proposals does not align with KCP&L's projected need for new capacity. A summary of bid evaluation results is included in Volume 3 of the IRP. ICF can not make a determination whether the bid evaluation was properly performed because no details are provided on how the busbar cost results comparison were derived.

7. ***Fuel Diversity*** – 54% of KCP&L's existing generating fleet is coal-fired. The low peak demand growth assumed by KCP&L for the entire forecast period will likely understate its need for additional capacity. The potential CO_2 regulations, possible

retirements of older plants, low natural gas prices, and lower CC capital costs should provide KCP&L enough incentives to diversity its generating resources to gas-fired CC. KCP&L should also take advantage of the SPP EIS market development to reach out to market for PPA opportunities.

8. ***Natural Gas Price*** – KCP&L's assumption of 20-year long-term forecast of natural gas price delivered at $[redacted]/MMBtu in real 2008 dollars appears to be on the low side, although it is at current market levels. Natural gas price at Henry Hub averaged $8.9/MMBtu during 2008 (See Exhibit-7). More comparable TX-OK Panhandle hub gas price averaged at $7.15/MMBtu in 2008 (See Exhibit-7). Recent market evidence shows that there is a significant decrease in gas price delivered to SPP powerplants. KCP&L should take advantage of the low gas price in developing PPA opportunities.

EXHIBIT 7
2008 ACTUAL NATURAL GAS PRICES (NOMINAL $)

Month	Henry Hub ($/MMBtu)	TX-OK Panhandle ($/MMBtu)
Jan	7.98	7.45
Feb	8.55	7.81
Mar	9.41	8.41
Apr	10.18	9.11
May	11.27	9.24
Jun	12.68	10.68
Jul	11.08	9.30
Aug	8.25	6.90
Sep	7.62	4.51
Oct	6.74	3.08
Nov	6.70	4.20
Dec	5.84	4.73
Average	**8.86**	**7.15**

Source: Bloomberg

9. ***Coal Price Forecast*** – Exhibit 8 presents KCP&L's Base Case delivered coal price forecast. Coal price delivered to KCP&L plants and reported by Federal Energy Regulatory Commission (FERC) Form 423 averaged $0.93/MMBtu between 1998 and 2007(Exhibit 9). There was an increase in delivered coal prices of about $1/MMBtu in the recent past two years of 2006 and 2007. KCP&L's Base Case assumption of delivered coal price at $[redacted]/MMBtu in real 2008 dollars for the entire forecast period appears to be high.

EXHIBIT 8
KCP&L DELIVERED COAL PRICE FORECAST (2008$/MMBTU)

KCP&L Delivered Coal Price ($/MMBtu)			
Year	Base	Low	High
Average (2009-2030)	[redacted]	[redacted]	[redacted]

Source: KCP&L IRP.

EXHIBIT 9
KCP&L DELIVERED COAL PRICES (2008$/MMBTU)

Historical Delivered Coal Prices	
Year	**Coal Price**
1998	0.90
1999	0.91
2000	0.94
2001	0.94
2002	0.88
2003	0.85
2004	0.88
2005	0.93
2006	1.01
2007	1.04
Average	**0.93**

Source: FERC 423

10. Capital Charge Rates – KCP&L's capital charge rate assumptions are similar to those assumed by ICF for all available generation technologies modeled (Exhibit 10). ICF capital charge rates are based on regulated utility financing assumptions. KCP&L's capital charge rate assumptions are reasonable.

EXHIBIT-10
CAPITAL CHARGE RATE (%)

	CT 7FA & LM6000	Combined Cycle/Cogen	Coal	Nuclear	Wind
ICF – Nominal	[redacted]%	[redacted]%	[redacted]%	[redacted]%	[redacted]%
KCP&L – Nominal	[redacted]%	[redacted]%	[redacted]%	[redacted]%	[redacted]%

Source: KCP&L IRP, ICF.