VOLUME 1:

EXECUTIVE SUMMARY

KCP&L

INTEGRATED RESOURCE PLAN

4 CSR 240-22.010

** PUBLIC **

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SECTION 1: INTRODUCTION

The fundamental objective of the IRP process and the preferred resource plan is to "provide the public with energy services that are safe, reliable and efficient, at just and reasonable rates, in a manner that serves the public interest." This objective requires that the utility shall:

- Consider Demand-Side Management (DSM) alternatives on an equivalent basis as Supply-Side alternatives
- Use minimization of the present worth of long-run utility costs as the primary selection criterion
- Identify and quantitatively analyze any other considerations which are critical to meeting the fundamental objective

KCP&L recognizes the importance of integrated resource planning as part of a broader comprehensive energy planning process which also includes a collaborative process that integrates the input from multiple sets of stakeholders to ensure that the public interest is adequately served. KCP&L plans to implement the preferred plan included in this IRP through a comprehensive and collaborative energy planning process that will result in what will be called KCP&L's Sustainable Resource Strategy or SRS. In the SRS, KCP&L will identify and quantitatively analyze any other considerations that allow for moving forward with a specific set of initiatives that were contemplated through the IRP's preferred resource plan and further refined in the SRS collaborative process. The selection of such a plan would be based on providing a balance of risk mitigation associated with:

- Critical uncertainties
- The potential for new or more stringent environmental laws or regulations

- Rate increases associated with the SRS.

KCP&L intends to enter discussions with the Missouri Public Service Commission (MPSC) Staff in preparation for filing a request to open a docket to initiate the SRS process. KCP&L recognizes the proven success of the original collaborative processes pursued in developing the current Comprehensive Energy Plan and believes these processes are key to the successful implementation of a preferred resource plan.

1.1 IRP REPORT STRUCTURE

Eight (8) separate volumes comprise this IRP filing:

1. Volume 1: Executive Summary
2. Volume 2: Missouri Filing Requirements including an index of Rule compliance
3. Volume 3: Load Analysis and Forecasting
4. Volume 4: Supply-Side Resource Analysis
5. Volume 5: Demand-Side Resource Analysis
6. Volume 6: Integrated Resource Analysis
7. Volume 7: Risk Analysis and Strategy Selection
8. Volume 8: Transmission Submission, as required by the Non-Unanimous Stipulation and Agreement in Case No. EO-2007-0008 (deficiency # 13), dated February 13, 2007

Appendices are attached to each Volume as required to fully document the IRP process, evaluations, considerations and findings.

1.2 IRP WAIVERS REQUESTED

KCP&L filed two applications for waivers concerning certain of the Commission's Electric Utility Resource Planning (IRP) reporting requirements. These applications for waivers as well as the Commission's responses are attached in Appendix 1.A.

1.3 THE PLANNING PROCESS UNDER TODAY'S UNCERTAINTIES

In addition to the stated objective of minimizing utility costs under uncertainties, KCP&L is also obligated to:

- Maintain generating and delivery system reliability including adequate generating reserve margins
- Maintain a competitive rate of return to investors
- Manage the risks inherent in future uncertainties

The utility industry has always faced uncertainties with the potential to change the economic selection of various resource alternatives, but rarely did those uncertainties have the potential to drive significant change within the industry. Today, key uncertainties may not only alter the selection of future generating technologies but also have the potential to force retirement of a portion of existing generation as well as drive development and implementation of new generating technologies, new environmental controls and new end-use efficiency technologies.

The two primary uncertainties with the highest potential to drive change are:

1. Potential restrictions on greenhouse gas emissions
2. The price and availability of natural gas

The impact of greenhouse gas restrictions could range from simply increasing the cost of fossil-fired generation to forcing retirement of base load generation, encouraging large scale fuel switching, implementation of zero or CO_2-neutral generation and large scale implementation of end-use efficiency and demand-side

measures. The timing for compliance with these potential restrictions may not be sufficient for the industry to comply in an orderly fashion, leading to significantly higher compliance costs and potentially an inability to meet the demands of the service territory for a number of hours each year for a number of years.

The uncertainties surrounding natural gas price and availability may exclude the alternative of large scale fuel switching from both a fundamental and an economic perspective.

The significance of these two uncertainties emphasizes the need to develop a broader more balanced Sustainable Resource Strategy that allows for collaborative discussion on the potential impact of the diverse resource strategies that could be contemplated under a number of possible future scenarios. The significance of contingency planning to address potential changes in the SRS is increased when considering these two primary uncertainties.

An additional uncertainty of significance is the availability of tax credits for renewable generation. Although this has a significantly lower impact than those discussed above, tax credits for renewable generation demonstrated an impact on resource selection during Integrated Analysis and Risk Analysis and Strategy Selection. Even without the tax credits, wind generation offers considerable risk mitigation for the two key uncertainties discussed above. The modeling performed did not identify a potential upper limit to the amount of wind that could be economically and effectively implemented.

1.4 KCP&L'S APPROACH TO IRP DEVELOPMENT

In developing this filing, KCP&L has endeavored to meet all requirements of Missouri's IRP rules covered under 4 CSR 240-22. KCP&L's IRP spans the 2008-2032 planning horizon. Data necessary to complete evaluations were derived from recognized industry sources, consultants, publications and other sources as appropriate. Data sources are noted in the text of the report, with many of the source documents included as appendices.

Several distinct tasks are included in the planning process:

- A detailed forecast of future demand and energy requirements
- An assessment of supply-side resource alternatives
- An assessment of demand-side resource alternatives
- Integrated Analysis, which evaluates the economics of different combinations of demand-side and supply-side alternatives over the planning timeline
- Risk Analysis, which provides a comparison of the range of economic results for selected resource plans under future uncertainties
- The selection of a preferred resource plan
- The adoption and executive approval of an implementation plan for executing the preferred resource plan
- Development of contingency plans to address development of further evaluations that may be necessary to mitigate the risk of future uncertainties

1.5 BRIEF OVERVIEW OF THE KCP&L SYSTEM

KCP&L is a mid-sized electric utility serving the metropolitan region surrounding the Kansas City, Missouri metropolitan area including customers in Kansas and Missouri. Table 1 provides a breakdown of the number of customers served, retail sales and peak demand by state.

Table 1: 2007 Number of Customers, Sales and Peak Demand By State

2007 Customers and Load By State			
State	**Number of Customers**	**Retail Sales (MWh's)**	**Peak Demand (MW)**
Missouri	271,009	8,980,212	1,964
Kansas	235,494	6,606,722	1,732
Total	**506,503**	**15,586,934**	**3,696**

In addition to a growing retail customer base, KCP&L has been a net provider of wholesale energy into regional markets. 2007 wholesale sales were over 5.6 million MWh.

KCP&L owns and operates a diverse generating portfolio to meet the needs of our customers. Table 2 summarizes KCP&L's generating portfolio resource mix.

Table 2: KCP&L Generating Portfolio Resource Mix

2007 Installed Capacity				
Assets by Fuel Type	**MW**	**% of Total Installed Capacity**	**Annual Energy (GWh's)**	**% of Annual Energy**
Coal	2,238	54%	14,905	72%
Nuclear	548	13%	4,873	24%
Oil	460	11%	2	0%
Gas	805	19%	542	3%
Renewables-Wind (1)	100	2%	396	2%
Total	4,151	100%	20,718	100%
(1) Wind Annual Energy is 12-month projected				

In addition to the above resources, KCP&L participates in firm capacity and energy contracts as shown in Table 3, below.

Table 3: Firm KCP&L Purchases & Sales (MWs) **Highly Confidential**

[redacted]

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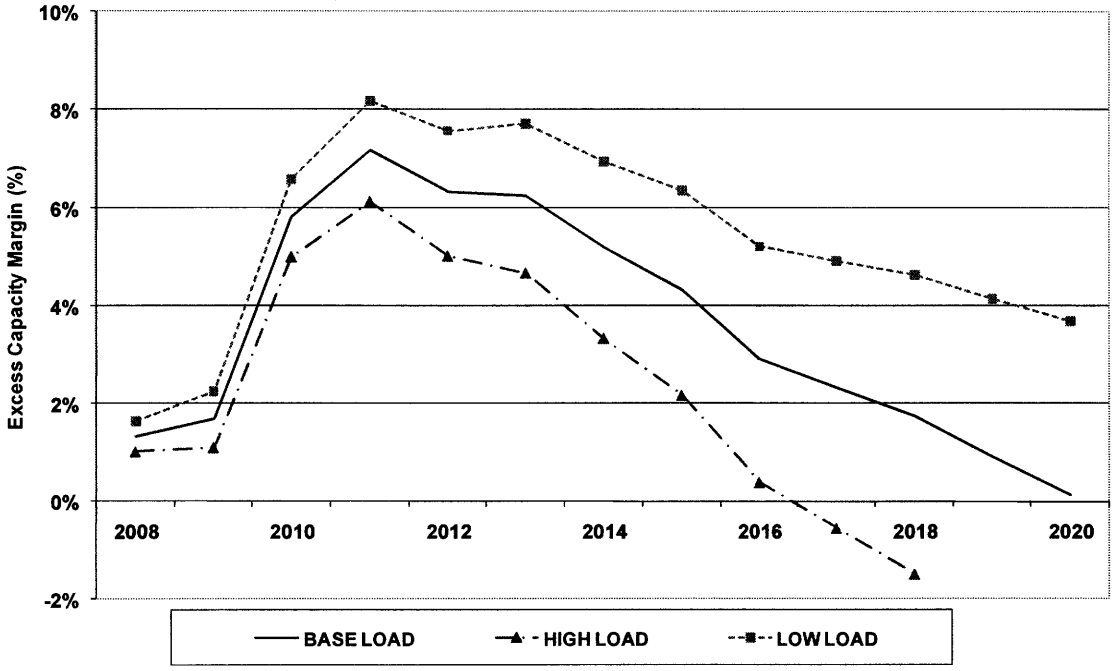
1.6 THE ROLE OF CAPACITY MARGIN IN RESOURCE PLANNING

Utilities are required to maintain at least a minimum level of generating capacity to provide for overall system reliability. For the Southwest Power Pool (SPP), the primary measure of adequate capacity is the capacity margin, or the percent of capacity in excess of projected peak loads. The minimum SPP capacity margin requirement is currently 12% and serves as one of the primary drivers requiring investment in new supply-side and/or demand-side resources. KCP&L's capacity margin forecast for base, low and high forecasted load growth compared to capacity margin requirements is shown in Figure 1 below. The Y-axis, "Excess Capacity Margin", represents the capacity margin percentage with respect to the required minimum of 12%. For example, 4% represents a 16% capacity margin (4% higher than the 12% minimum). At 0%, KCP&L would just meet the 12% capacity margin requirement.

Based on the existing portfolio of assets including the planned addition of Iatan-2 (2010) and currently approved DSM programs, KCP&L is projected to have adequate resources to meet generating capacity margin requirements until the 2020 timeframe.

Figure 1: Projected Capacity Margin in Excess of Minimum Requirements



This executive summary serves several purposes including:

1. Section 1 provides an introduction and brief overview of Integrated Resource Planning (IRP) and the Kansas City Power & Light system

2. Section 2 meets the requirements of Rule 22.080 (1) (D), which requires a narrative summary of the reports and information contained under Load Analysis and Forecasting, Supply-Side Resource Analysis, Demand-Side Resource Analysis, Integrated Resource Analysis and Risk Analysis and Strategy Selection

3. Section 3 provides the preferred resource plan as required by Rule 22.070 (10) (A)

4. Section 4 provides the Implementation Plan as required under Rule 22.070 (10) (A) and Rule 22.070 (10) (B)

5. Section 5 discusses resource acquisition plans as required by Rule 22.070 (10)

6. Section 6 provides summary discussions and contingency plans as required by Rule 22.070 (10) (D).

SECTION 2: SUMMARY OF REPORT FINDINGS

As required by Rule 22.080 (1) (D) the discussions below provide a narrative description and summary of the reports and information required by Rule 22.080 (1) (C).

2.1 LOAD FORECAST

The load forecast utilized for the IRP starts with the gross forecast of monthly peak and energy shown in Volume 3, Load Analysis and Forecasting. The net peak and energy forecast was developed by reducing the gross forecasts by the projected impacts of currently approved DSM and Energy Efficiency (EE) programs under the Comprehensive Energy Plan (CEP) approved in Missouri Case EO-2005-0329. From this starting point, various DSM/EE program penetration levels are then included in alternative resource plans to evaluate the economics of the different penetration levels.

The DSM/EE impacts shown in Volume 3 of this IRP are based on expectations for continued growth in the currently approved programs and therefore will not match the base forecasts utilized in the IRP analysis. This change was made because the load forecast serves two distinctly different applications. The first application is for fuel and interchange budget development. Under this budgeting application, it is important to include the impacts of anticipated DSM/EE programs including anticipated program continuation and growth beyond the 5-year pilots. The load forecast shown in Volume 3, Load Analysis and Forecasting, meets this application.

The second application of the load forecast is to evaluate alternative resource plans under the IRP process. Evaluation of the anticipated continuation and growth of DSM/EE programs is one of the evaluations performed in the IRP. For this application, the programs approved under the original Comprehensive Energy Plan (CEP) are utilized as the base assumption for DSM/EE penetration levels. The gross load forecast, is the same for both applications; however the assumed level of DSM/EE impacts would be different.

Gross system energy, or energy usage prior to accounting for DSM/EE impacts, is projected to grow by an average of 1.3 percent per year over the 2007-2030 time period. Gross annual peaks are projected to grow an average of 0.9% per year over the same period.

Forecasts of economic drivers utilized to develop the load forecast were provided through a contract with Moody's Economy.com. Key drivers are discussed below.

- Economic Conditions are projected to grow more slowly than historic trends (Gross Metro Product is currently projected to grow at 1.7%, personal income at 1.4% and employment at 1.0% per year for the forecast period)

- Demographic Factors show that the population of metropolitan Kansas City will grow at 0.4% between 2006 and 2030. Population losses in Jackson County, Missouri will be more than offset by population increases in Johnson County, Kansas and the Northland area of the metro (the number of households are projected to grow by 0.6% and the population is projected to grow by 0.4% during the forecast period)

- Appliance Saturation and Efficiency Levels demonstrate a major impact on peak and load growth. Since air conditioning penetrations show high saturations, air conditioning load growth is essentially limited to new construction. Air conditioning replacements are projected to increase efficiency compared to the existing fleet of units. Therefore, total air conditioning loads are projected to decrease over the planning horizon despite population increases. More efficient appliance installations are also projected to minimize growth of energy usage in this sector.

2.2 SUPPLY-SIDE ANALYSIS

A total of 39 technologies were evaluated using the pre-screening processes required under Rule 22.040. Supply-Side categories included base load, intermediate, peaking, renewable and energy storage technologies. Fuel-types included natural gas, oil, coal, biomass, nuclear and renewables.

KCP&L employed two levels of pre-screening. The first level was completed based on the required evaluations under Rule 22.040. For the second level, KCP&L utilized an outside vendor, Ventyx, to screen technologies using the Capacity Expansion Module (CEM)© contained in MIDAS™ software. The CEM performs capacity optimization modeling under defined scenarios. Basically, KCP&L provided the values of key uncertainties for 10 future scenarios. The CEM then selected the least cost combination of resource additions for each one of the 10 future scenarios. Resource alternatives that were not selected in the optimization modeling were candidates for exclusion from Integrated Analysis. Further details of the Ventyx process are included in Volume 4, Supply-Side Analysis and Volume 7, Risk Analysis.

The technologies passed to Ventyx for the optimization modeling are shown in the Table 4 below.

Table 4: Technologies Evaluated by Ventyx

Combined Cycle	Supercritical Pulverized Coal with and without Carbon Capture and Sequestration (CCS)	Circulating Fluidized Bed Combustion
Integrated Gasification Combined Cycle (IGCC) with and without Carbon Capture and Sequestration (CCS)	Combustion Turbines (CT's)	Nuclear
Wind	Compressed Air Energy Storage (CAES)	Molten Carbonate Fuel Cells
Solar Parabolic Trough	Photovoltaic Flat Plate	Microturbines
Biomass Alternatives	DSM Programs	Energy Efficiency Programs

Based on the first and second level pre-screening evaluations, the technologies advanced to modeling under Integrated Analysis included those technologies shown in Table 5 below.

Table 5: Technologies Evaluated Under Integrated Analysis

Combined Cycle	Supercritical Pulverized Coal with and without Carbon Capture and Sequestration (CCS)	Nuclear
Integrated Gasification Combined Cycle (IGCC) with and without Carbon Capture and Sequestration (CCS)	Combustion Turbines (CT's)	Energy Efficiency Programs
Wind	Photovoltaic Flat Plate	Biomass Alternatives
CCS on Existing Coal Units	DSM Programs	

2.2.1 PROBABLE ENVIRONMENT COST

As required by Rule 22.040 (2) (C), the evaluation of alternative technologies is to include two rankings. One based on "Utility Cost" and one based on "Probable Environmental Cost." For Utility Cost, KCPL assumed the inclusion of costs associated with the Clean Air Mercury Rule (CAMR) and the Clean Air Interstate Rule (CAIR). Although these regulations will change based on recent court actions and any subsequent rulemaking, KCPL assumed that the projected cost impacts of the original cap-and-trade markets adequately addresses the range of expected outcomes.

Based on the IRP rules, "Probable Environmental Costs" are defined as the joint cost of simultaneously achieving the mitigation levels for all identified emission restrictions that, in the judgment of utility decision-makers, may be imposed at some point in the planning horizon.

The most significant regulation included in the "Probable Environmental Cost" is the potential for restrictions on greenhouse gas emissions. For modeling purposes, KCP&L assumed a CO_2 cap-and-trade market would be in place beginning in 2012. It was also assumed that allowances would be available on an as needed basis.

Additional Probable Environmental Costs are listed below:

- Requirements to landfill all coal combustion by-products, a potential result of mercury controls and any potential future disposal regulations;
- Requirements to install cooling towers and fish protection on circulating water systems, based on Clean Water Act Sections 316 (a) and (b) and associated future potential regulations;
- Control of zebra mussels (this is not a potential regulation, but rather a potential environmental issue facing the industry); and
- A general proxy value was also developed to cover a variety of air emissions that potentially could face additional restrictions over the 20-year planning horizon.

2.2.2 REQUEST FOR PROPOSAL FOR PURCHASED POWER

A request for proposal (RFP) was issued on August 17, 2007 soliciting proposals for supplying capacity and energy beginning in 2010 and extending to 2022 and beyond. The RFP indicated that the request was issued to fulfill requirements of the IRP rules, specifically Rule 22.040 (5).

A detailed review of the RFP responses is included in Volume 4, Supply-Side Resource Analysis, Section 10. Proposals received included offers in six (6) general categories:

1. Landfill gas powered generation
2. Natural gas and diesel powered reciprocating engines
3. Purchased power from combined cycle units
4. Purchased power agreements from parties that offered aggregated distributed generation within the KCP&L service territory
5. An offer to sell back to KCP&L capacity from its Montrose station
6. Wind powered generation

Based on projected capacity margins as shown in Figure 1, KCP&L does not require additional resources in the timeframes offered by the various proposals. Offers received would not be available in the 2020 timeframe when additional resources may be required. Therefore the primary value derived from the RFP process was to gain insight regarding current market values for power purchase opportunities. An evaluation of the proposals indicated that ownership of assets was preferred to long-term power purchases.

2.3 DEMAND-SIDE ANALYSIS

KCP&L developed an extensive list of DSM and EE programs designed to provide coverage of all required end-use applications and to provide programs to all customer classes. Various outside consultants with expertise in development, implementation and monitoring of DSM and EE programs provided input regarding:

- End-use applications
- Program selection and development

- Program screening and benefit-cost testing
- Program implementation and marketing
- Program monitoring and verification

In addition, KCP&L consulted with numerous customer groups, focus groups, appliance vendors, home builders, HVAC providers and others to learn the issues faced by key decision makers when evaluating purchase decisions regarding end-use appliance efficiency and other energy related items.

Based on this input, KCP&L developed an extensive offering of DSM and EE programs to meet the full requirements of the IRP. The detailed summary of the processes, evaluations and results is shown in Volume 5, Demand-Side Resource Analysis.

2.4 INTEGRATED ANALYSIS

Alternative resource plans were developed to cover a range of supply-side and demand-side technologies as shown in Table 5. In addition, alternative plans included various DSM/EE program performance levels and resource implementation timing. DSM and EE programs were analyzed on an equivalent basis to supply-side alternatives fulfilling Rule 22.010 (2) (A).

KCP&L developed 26 alternative resource plans for preliminary evaluations. Based on initial modeling results, six (6) alternative resource plans were considered for final evaluation and preferred plan selection as shown in Table 6 below. Two additional plans are also shown to compare a more traditional resource plan and a plan to meet potential Renewable Portfolio Standards (RPS). These two plans are shown in Table 7 below. Plan 25 adds a 10% biomass co-fire option at Montrose to Plan 19. Plan 1 includes the addition of coal-fired generation and a combined cycle unit.

2.5 RISK ANALYSIS AND STRATEGY SELECTION

Risk Analysis is the final phase of IRP evaluations. Under Risk Analysis, all the elements developed in meeting the other IRP requirements are brought together for inclusion in economic models. The economic results of alternative resource plans are compared to determine which plans offer the lowest levels of Net Present Value of Revenue Requirements (NPVRR). Comparisons also include consideration of risk mitigation that may allow for the selection of a preferred resource plan that does not provide the lowest NPVRR on an expected-value basis, but instead provides risk mitigation over the range of potential future uncertainties.

Alternative resource plans are first compared on an "expected" value basis. Next, the range of economic results are compared to demonstrate the exposure of each plan under key future uncertainties. The plan with the lowest NPVRR on an expected basis may also be the plan with higher levels of cost exposure under specific outcomes of key uncertainties, and therefore may not represent the preferred plan. Minimization of future risk exposure may be a more important measure than the expected value basis of NPVRR.

SECTION 3: PREFERRED RESOURCE PLAN

KCP&L selected the preferred resource plan based on economic results utilizing measures including "Probable Environmental Costs." This measure provides a representation of more diverse potential futures than the "Utility Cost", or current regulatory cost measure. A more detailed description of the process, evaluations and considerations used in the preferred resource plan selection is included in Volume 7, Risk Analysis and Strategy Selection of this IRP filing.

3.1 FUNDAMENTAL OBJECTIVES OF THE RESOURCE PLANNING PROCESS

The preferred resource plan meets the fundamental objective of the resource planning process as required by Rule 22.010 (2) to provide the public with energy services that are safe, reliable, and efficient, at just and reasonable rates in a manner that serves the public interest. The preferred plan also meets the requirement to use "minimization of present worth long-run utility cost as the primary selection criteria", while taking into account the discussions in Rule 22.010 (2) (C). This rule, 22.010 (2) (C), requires consideration of risks and other factors that may constrain or limit the minimization of NPVRR in selection of a preferred resource plan.

3.2 RESULTS OF INTEGRATED AND RISK ANALYSIS

KCP&L initially evaluated twenty-six alternative resource plans. The final evaluation process focused on the six resource plans that yielded the lowest NPVRR. These six plans are shown below in Table 6. A complete list of the 26 alternative resource plans is shown in Section 2.2.1 of Volume 6, Integrated Resource Analysis.

Table 6: Lowest NPVRR Alternative Resource Plans

	Plan 26	Plan 19	Plan 21	Plan 15	Plan 20	Plan 24	Plan 2
Ranking	1	2	3	4	5	6	7
Delta 25-Year NPVRR		$13 M	$15 M	$65 M	$66 M	$120 M	$131 M
EE: N= Normal C&I A = Aggressive C&I R= Residential	A + R (2010)	A + R (2010)	A + R (2010)	A + R (2010)	A + R (2010)	A + R (2010)	N + R (2010)
DSM (CEP-1, Growth, Curtail)	CEP-1	CEP-1	Growth	CEP-1	Growth	Curtail	CEP-1
Wind	400 MW (2012-2015)	400 MW (2009-2012)	400 MW (2009-2012)			400 MW (2009-2012)	
PTC	Yes	Yes	Yes	N.A.	N.A.	Yes	N.A.
SCPC							
Combustion Turbines	154 MW (2029)	154 MW (2029)	154 MW (2029)	154 MW (2027 & 2031)	154 MW (2028 & 2032)	154 MW (2027 & 2031)	154 MW (2027 & 2030)
Nuclear							
Coal Retirement							

In addition to these six plans, two other plans are also shown for comparison:

1. Biomass alternatives (Plan 25), and

2. Traditional generating technologies, e.g. coal and combined cycle (Plan 1)

These two plans are shown in Table 7 below:

Table 7: Biomass and Traditional Generating Technology Resource Plans

	Plan 25	Plan 1
Ranking	8	13
Delta 25-Year NPVRR	$209 M	$234 M
EE: N= Normal C&I A = Aggressive C&I R= Residential	A + R (2010)	N + R (2010)
DSM (CEP-1, Growth, Curtail)	CEP-1	CEP-1
Wind	400 MW (2009-2012)	
PTC	Yes	N.A.
SCPC	10% Biomass (Montrose Station)	300 MW (2022)
Combustion Turbines	154 MW (2029)	
Combined Cycle		273 MW (2031)
IGCC		
Coal Retirement		

Each of the top three plans, Plans 26, 19 and 21, include aggressive DSM/EE programs starting in 2010, 400 MW of wind generation in the 2009-2015 timeframe and the addition of 154 MW of peaking capacity toward the end of the planning horizon in 2029. KCP&L did not model a 2009 implementation of aggressive DSM/EE; however, alternative resource plans were modeled showing later implementation dates. The plans with later DSM/EE start dates showed higher NPVRR results indicating that early implementation is preferred to delayed implementation.

The only difference between the three plans with the lowest NPVRR is the timing of wind installations and the funding levels and penetration of DSM. A more detailed discussion of the top three plans is included below.

3.2.1 DEMAND-SIDE MANAGEMENT EVALUATION

For modeling purposes, both DSM and EE programs were assumed to be amortized over a 10-year period and included a return "of and on" investments in these programs. It should be noted that the accounting treatment for DSM/EE programs

may provide different cost recovery and incentive models based on program tariffs and designs as approved by the Commission. Additionally, it is worth noting that KCP&L makes a distinction between DSM and EE programs. Specifically for modeling purposes in this IRP filing, DSM refers to two programs:

- Residential air conditioning control (Energy Optimizer), and
- Commercial curtailment program (MPower).

The two resource plans with the lowest NPVRR include "CEP-1" levels of DSM. In the modeling, the CEP-1 level included continued funding at current program budget levels plus general annual cost escalations. Therefore, the two plans demonstrating the lowest NPVRR results both include continued funding of DSM programs (MPower and Energy Optimizer) at current levels.

KCP&L also modeled various spending levels for the DSM programs. The only difference between Plan 21 and Plan 24 is the funding and peak impacts of the DSM programs. Comparing these two plans indicates that increasing DSM funding is preferred to curtailing program spending. In Plan 24, when DSM is curtailed, the results indicate the need for additional supply-side resources, which results in a higher 25-year NPVRR for Plan 24.

For the twenty-six alternative resource plans evaluated, one of the following levels of energy efficiency (EE) was applied:

1) No EE
2) Residential EE only
3) Normal Commercial and Industrial (C&I) EE only
4) Aggressive C&I EE only
5) Residential and Normal levels of C&I EE
6) Residential and Aggressive levels of C&I EE

In reviewing the resource plans with the lowest NPVRR, all six of the lowest NPVRR levels included Residential and Aggressive levels of C&I EE – the highest levels of EE penetrations evaluated as well as the CEP-1 level of DSM programs.

3.2.2 WIND EVALUATION

Comparison of NPVRR shows that Plan 26 and Plan 19 have only a small difference in their expected 25-year NPVRR values. The only difference between these two alternative resource plans is the timing of wind installations. Plan 26 delays installations until a 2012 starting date while Plan 19 begins installations in 2009. Due to the small difference in NPVRR values, the timing of installation dates does not appear to be a critical uncertainty. There are risks associated with selection of either plan. Plan 19 commits KCP&L to the risk of committing funds early while Plan 26 exposes KCP&L to continued price escalations. The SRS process will provide additional collaborative discussions to further develop the timing and scope of recommended wind additions.

For the purposes of this IRP filing, the discussion below considers five (5) uncertainties and their potential impacts on the recommended timing of wind installations.

Uncertainty 1: Modeled Cost Assumptions (Highly Confidential)

As modeled, the installed cost of wind is **[redacted]**/kW in 2008 $'s. KCP&L is currently evaluating a potential 100 MW wind addition in 2009 with firm pricing included in the terms. The expected total installed cost including transmission needs shows a savings of over **[redacted]**/kW compared to the cost used to model wind in the IRP. This decrease in costs lowers the NPV of the 2009 wind farm by more than $30 million compare to the cost modeled in the IRP. As shown in Table 6 above, the 25-year NPVRR delta between Plan 26 and Plan 19 is only $13 million.

Uncertainty 2: Modeled Capacity Factors

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To model long-term expectations for wind, KCP&L had to assume an average capacity factor for wind generation over the planning horizon. A 38% capacity factor was used in the model to account for the expectation that wind sites with higher capacity factors may not always be available. The 2009 wind farm discussed above is expected to provide a capacity factor of over **[redacted]**%. Because this high-capacity site may not be available if installation is delayed until 2012, the increase in generation provided by the 2009 wind farm may reduce the NPVRR delta between Plan 26 and Plan 19.

Uncertainty 3: Modeled Commodity and Construction Escalation

To account for expectations over the 20-year planning horizon, KCP&L applied a long-term inflation rate of 2.5%[1]. Recent commodity price and construction cost trends show this assumption may significantly undervalue the cost associated with delaying projects. A continuation of this significant upward trend in capital costs of wind projects would shrink the 25-year NPVRR delta between Plan 26 and Plan 19.

Uncertainty 4: Pre-Screening Evaluation Results

An additional finding that may be significant is the ranking of wind generation during pre-screening. Under the Probable Environmental evaluations, wind was the top ranked, or lowest cost technology evaluated—indicating that wind has significant risk mitigation value.

Uncertainty 5: Production Tax Credit

It is assumed that the production tax credit (PTC) that is currently available will not be available for any significant number of years into the future due to the significant growing cost of the credits. Therefore, it would be advantageous to install wind earlier rather than later to take advantage of the PTC for as many years as possible.

[1] Global Insights Utility Cost Service, Third Quarter 2007, Cost Trends of Utility Construction: North Central Region (Trend 073).

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3.3 THE PREFERRED PLAN

The two plans with the lowest NPVRR, Plan 19 and Plan 26, include four (4) key resource additions:

1) Continuation of CEP-1 Demand Side Management (DSM) programs

2) Residential and Aggressive C&I Energy Efficiency (EE) programs as defined in Volume 5, Demand-Side Resource Analysis

3) 100 MW of wind annually up to a total addition of 400 MW

4) 154 MW of Combustion Turbines (CTs) in 2029

Based on the above discussions, Plan 19 was selected as the preferred plan. Because the potential 2009 wind addition demonstrates the potential for significant savings compared to the costs modeled in the alternative resource plans, KCP&L anticipates moving forward with this addition. For contingency planning purposes, the preferred plan also includes the recommendation to begin early stage develop of a nuclear generation option.

3.4 NUCLEAR DEVELOPMENT

During the optimization modeling performed by Ventyx, Nuclear generation, based on the assumptions for cost that were modeled, was selected as a preferred resource addition under highly restrictive CO_2 regulations. Nuclear generation has the potential to offer significant environmental benefits and risk reduction under key uncertainties faced by the utility industry. Nuclear, if feasible, is perhaps the only mature carbon-free supply-side technology that meets the full range of system reliability requirements for base load generation. There remain significant uncertainties as to how the nuclear industry will evolve to meet the challenge of constructing a large number of nuclear plants over the next several decades. These uncertainties include:

- Construction cost range

- Adequate number of manufacturing, engineering and construction firms
- Dual construction and operating permitting process
- Certification of standard designs
- Waste disposal requirements and options

To reduce the scope of these uncertainties and maintain the option to develop this carbon-free technology, starting the early stages of development of a nuclear alternative is recommended as a part of the implementation plans for the preferred resource strategy. There remains much uncertainty surrounding the future of nuclear development in the U.S. These uncertainties include permitting issues, public acceptance, licensing requirements, supply-chain infrastructure needs and the ultimate cost of materials and construction. The long lead times and uncertainties associated with nuclear project development indicates a need to better understand the issues and to pursue preliminary development efforts to maintain the option of implementing this resource in the 2020-2025 time frame. Delaying preliminary development efforts risks moving the nuclear option out beyond the 2030 time frame.

SECTION 4: IMPLEMENTATION PLAN

Rule 22.070 (9) requires utilities to provide descriptions of on-going and planned research activities to update and improve the quality of data used in resource planning. KCP&L's implementation plan includes activities to improve the quality of data used throughout the planning process. Rule 22.070 (9) (D) also requires identification of critical paths and major milestones for each resource acquisition project including decision points for committing to major expenditures. The following sub-sections discuss specific plans to update and improve the quality of data used in resource planning. Critical path issues are discussed in Section 5.

4.1 THE SUSTAINABLE RESOURCE STRATEGY (SRS) PROCESS

As discussed in Section 1 of this Executive Summary, KCP&L intends to implement the preferred plan through a collaborative process similar to the process pursued during development of the Comprehensive Energy Plan (CEP). The CEP efforts lead to a Stipulation and Agreement that was filed on March 28, 2005, and amended on July 2, 2005. The Commission Report and Order approving the Stipulation and Agreement was issued on July 28, 2005 in Case No. EO-2005-0329. The new collaborative process, referred to as the Sustainable Resource Strategy (SRS), will involve similar efforts and processes as those pursued under the CEP.

Using the data developed during the IRP process, the SRS will expand on evaluations of key uncertainties and potentially explore additional resource alternatives through a collaborative dialogue that will seek the collective inputs from numerous stakeholders. At the time of filing this IRP, KCP&L anticipates entering discussions with the MPSC Staff to purse opening a docket for the SRS process.

4.2 LOAD FORECASTING RESEARCH

For load forecasting, KCP&L will obtain updated forecasts of key economic and demographic trends for the Kansas City metropolitan region from a firm specializing in producing such forecasts. KCP&L plans to conduct its next residential appliance saturation survey in 2009. This survey will include KCP&L customers as well as

those of St. Joe Light and Power and Missouri Public Service (MPS). KCP&L will continue to obtain and use updated end-use data from the U.S. Department of Energy (DOE) for its statistically adjusted end-use models. Five (5)-year forecasts will be updated annually with long-term (20-year) forecasts updated every three years. This research meets the requirements of Rule 22.070 (9) (A).

4.3 DEMAND-SIDE RESEARCH

KCP&L will build on the experience gained from implementation of the CEP Demand-Side programs and will continue to work with outside consultants, industry groups and subject matter experts in efforts to improve overall program results including cost reduction and increased participation. A detailed discussion of Demand-Side Implementation Planning is attached in Appendix 1.C. In addition, Section 9 of Volume 5 describes the program evaluations, measurement and verification strategies. Section 9 of Volume 5 also refers to Appendix 5.O, which contains detailed program descriptions and 3 completed measurement & verification reports covering Low Income Weatherization and the Compact Florescent Light program. The attached Demand-Side Implementation Plan and Section 9 of Volume 5 meet the requirements of Rule 22.070 (9) (B).

4.4 SUPPLY-SIDE RESEARCH

KCP&L will continue active membership in the Electric Power Research Institute (EPRI) to maintain access to the latest technology costs and developments available to the industry. On-going work with equipment suppliers, consultants and other utilities will continue. KCP&L maintains a data base of technologies including at least annual updates of key technologies. The data base includes cost, performance and the developmental status of each technology.

KCP&L will monitor developments in promising technologies such as oxygen-firing, plasma arc, alternative gasification processes and carbon capture and sequestration (CCS). KCP&L is a co-funder of the joint EPRI and Alstom chilled ammonia pilot

project to test this process for carbon capture. Additionally, KCP&L recently increased EPRI funding for additional CCS evaluations.

These Supply-Side initiatives meet the requirements of Rule 22.070 (9) (C).

4.5 CRITICAL PATHS

The critical paths and major milestones for each resource acquisition are included below in Section 5, Acquisition Plans. These milestone and critical paths meet the requirement of Rule 22.070 (9) (D).

SECTION 5: ACQUISITION PLANS

5.1.1 WIND RESOURCES

Future installations of wind resources are expected to follow the critical paths, milestones and processes involved in KCP&L's first wind resource addition, the Spearville wind farm. A detailed implementation plan is attached in Appendix 1.B.

5.1.2 DSM AND ENERGY EFFICIENCY

A detailed implementation and acquisition strategy is attached in Appendix 1.C.

5.1.3 COMBUSTION TURBINES

Combustion turbines (CTs) are not required for several years. KCP&L will continue to monitor the market and determine if CTs remain the preferred choice in subsequent IRP filings.

The acquisition plans regarding future wind resources, DSM, Energy Efficiency, and Combustion Turbines fulfill the requirements of meet Rule 22.070 (10).

5.1.4 EARLY STAGES OF NUCLEAR DEVELOPMENT

The implementation of early nuclear development is contingent upon additional discussions with the MPSC Staff.

5.1.5 APPROVAL OF RESOURCE ACQUISTION PLAN

Attached below is a copy of KCP&L's Corporate Approval Letter signed by Mr. William Downey, President and CEO of Kansas City Power and Light Company. Inclusion of this signed letter addressing the IRP results and the proposed implementation of the preferred resource plan serves as the approval required by Rule 22.080 (1) (D) and 22.070 (10).

Kansas City Power & Light Company
2008 Integrated Resource Plan
Corporate Approval Statement (4 CSR 22.080(1)(D))

The 2008 Integrated Resource Plan ("Resource Plan") of Kansas City Power & Light Company ("KCPL") was prepared under our direction and control. To the best of our knowledge, information, and belief, the methods used and the procedures followed by KCPL in formulating the resource acquisition strategy contained in the Resource Plan comply with the provisions of Chapter 22 of the regulations of the Missouri Public Service Commission ("Commission") subject to waivers previously granted by the Commission. The Resource Plan evaluates potential resources using expected prices and availabilities. Actual prices and availabilities will be established by using a request for proposals process and could result in changes to the preferred plan. The conclusions reached in the Resource Plan could also be affected by the outcome of KCPL's Sustainable Resource Strategy ("SRS") process, a collaborative initiative the Company will be pursuing with interested stakeholders. KCPL intends to implement the preferred plan as it might be modified by the SRS process. Pursuant to the requirements of the Commission's regulations, KCPL will notify the Commission if KCPL determines that circumstances have changed so that the preferred resource plan is no longer appropriate.

William H. Downey
President and Chief Executive Officer
Kansas City Power & Light Company

Burton L. Crawford
Manager, Energy Resource Management
Kansas City Power & Light Company

SECTION 6: SUMMARY DISCUSSIONS AND CONTINGENCY PLANS

The most significant uncertainty facing the utility industry today is the potential for greenhouse gas restrictions. The impact of greenhouse gas restrictions is dependent on the specific requirements of potential regulation including:

- The level of available allowances
- Whether restrictions include a pure tax or a cap and trade market
- Whether the price of emissions allowances will be controlled (safety-valve pricing)
- Whether hard-caps are implemented
- The pace of development and implementation of technologies to address greenhouse gas emissions

Resource plans that include high levels of DSM and Energy Efficiency as well as the addition of CO_2-neutral or non-CO_2-emitting resources, such as renewable, nuclear and biomass alternatives will provide risk mitigation for greenhouse gas regulation.

KCP&L's preferred plan includes resources to mitigate CO_2 risks while striking a strong balance between all of the planning objectives included in the IRP rules. Not only does the plan minimize the 25-year NPVRR, it also provides the technologies, energy efficiency and DSM programs to reduce the risks associated with potential greenhouse gas restrictions without extensive reliance on fuel switching (natural gas), or unproven technologies.

Contingency Plans

The preferred resource plan establishes a strong foundation for meeting the future uncertainties faced by utilities. However, additional considerations and on-going planning will be required to monitor uncertainties and provide improvements to the plan as more is learned regarding key uncertainties.

As part of contingency planning, KCP&L recommends four key initiatives that provide risk mitigation against significant uncertainties.

1. Early installation of the next wind project to reduce exposure to commodity price increases and better position the company in the face of potential greenhouse gas restrictions.

2. Explore the need to begin the development of a nuclear option to position the company to take advantage of the risk mitigation provided by this zero-emission technology.

3. Fund studies and appropriate pilot projects to further explore non-traditional generation and other projects that may provide CO_2 mitigation, such as solar, biomass, animal waste, and other opportunities.

4. Continue to fund and explore research and development of Carbon Capture and Sequestration technologies.