

In the Matter of the Application of Kansas City Power &)
Light Company for Approval to Modify Its Tariffs to) Docket No. 07-KCPE-905-RTS
Continue the Implementation of Its Regulatory Plan.)
)

STATE CORPORATION COMMISSION

AUG 03 2007

 Docket
Room

DIRECT
STAFF TESTIMONY
PREPARED BY
ROBERT H. GLASS
UTILITIES DIVISION
KANSAS CORPORATION COMMISSION

1 **Q. Please give your name and business address.**

2 A. Robert H. Glass, Kansas Corporation Commission, 1500 S.W. Arrowhead Road, Topeka,
3 Kansas, 66604-4027.

4 **Q. In what capacity does the Commission employ you?**

5 A. I am employed as Managing Research Economist. My responsibilities include research
6 on regulatory policy topics and analysis of specific issues found in dockets before the
7 Commission.

8 **Q. Have you previously testified before the Commission?**

9 A. Yes. I provided testimony as a Staff consultant for the KPL/KGE merger (Docket-91-
10 KPLE-140-SEC) and for the Westar/KCPL merger (Docket No. 97-WSRE-676-MER). In
11 my current position, I provided testimony for Docket No. 06-KCPE-828-RTS, Docket
12 No. 06-KGSG-1209-RTS, and Docket No. 07-WSEE-616-PRE.

13 **Q. Please describe your qualifications?**

14 A. I have a B.A. from Baker University with a major in history. I have an M.A. and Ph.D. in
15 economics from the University of Kansas. Prior to my employment at the Commission, I
16 was employed at the University of Kansas by the Institute for Business and Economic
17 Research, which later became the Institute for Public Policy and Business Research, for
18 22 years. My primary duty was performing economic research.

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I. INTRODUCTION

Q. What is the purpose of your testimony?

A. My purpose is twofold:

(1) I evaluate the off-system sales margin forecast provided by Kansas City Power & Light (KCPL) in the testimony of Mr. Michael M. Schnitzer.

(2) I review the performance of the Spearville Wind Farm to this point in time.

Q. What is your conclusion concerning the off-system sales margin forecast?

A. The model and data Mr. Schnitzer uses to generate the forecast for the off-system sales margin are appropriate. The resultant off-system sales margin forecast is a reasonable forecast. Staff's one concern is that a simpler, easier to understand and use model might be more appropriate.

Q. What is your conclusion regarding the productivity performance of Spearville Wind Farm?

A. As of early July 2007, the wind farm is producing about 70% of the electricity it was forecast to produce. However, part of the inadequate performance possibly stems from bad luck (the ice storm last winter) and the initial pitfalls of starting any large, sophisticated mechanical project (equipment does not work as promised and needs fixing). As for now, Staff will continue collecting data and monitoring the performance of the wind farm, and Staff will keep the Commission apprised of future developments.

Q. How is your testimony organized?

A. I have two major sections of testimony: the first section discusses KCPL's off-system sales margin model and forecast, and the second section discusses the production performance of the Spearville Wind Farm.

1 **II. KCPL’s Probabilistic Forecast of Off-System Sales Margin**

2 **Q. What is “Off-System Sales Margin”?**

3 **A. “Off-System Sales Margin” is the profit made by KCPL by selling electricity in the short-**
4 **term wholesale electricity market. KCPL’s basic order of providing services is integral to**
5 **the calculation of that profit. The basic order of service for KCPL generators is:**

- 6 1. Service KCPL retail customers
7 2. Service “Firm” or contracted wholesale customers, and
8 3. Sell remaining energy to the “non-Firm”, short-term wholesale market.¹

9 The profit (revenue – cost) from the sale of asset-based energy to the “non-Firm”
10 wholesale market is the off-system sales margin.

11 **Q. Why does the off-system sales margin need to be forecast?**

12 **A. KCPL proposes an Energy Cost Adjustment (ECA) Mechanism which will recover “all**
13 **fuel, purchase power and related expense, as well as credit of off-system sales margins,**
14 **through a separate retail tariff.”² Mr. Chris B. Giles (Mr. Giles) argues that because fuel**
15 **costs, purchase power costs, and off-system margin have significant volatility, historical**
16 **data for these variables should not be used to set the ECA tariff. The volatility means**
17 **that “historical data is not representative of future fuel and purchase power costs or future**

¹ Michael M. Schnitzer described the creation of an “Off-System Margin” in his Direct Testimony for this docket as following. “After serving retail sales to its native load and ‘Firm’ wholesale sales to customers such as City Utilities of Springfield, KCPL makes ‘Non-Firm’ sales to the short-term market with prices and terms determined at the time of sale. In any hour, Off-System Contribution Margin is the difference between gross revenues and costs for these sales.” Direct Testimony of Michael M. Schnitzer, this docket, pp. 4-5.

Mr. Burton L. Crawford in his testimony for Docket No. 06-KCPE-828-RTS provides the following two equations to calculate the “Off-System Margin” or as he refers to it, the wholesale margin (p. 20):

$$\begin{aligned} \text{Wholesale Margin} &= \text{Non-Firm Sales} - \text{Cost of Non-Firm Sales} \\ \text{Cost of Non-Firm Generation} &= \text{Fuel Cost} * \frac{\text{Non - Firm Generation}}{\text{Total Generation}} \end{aligned}$$

² Direct Testimony of Chris B. Giles, this docket, p. 9. For a full explanation of Staff’s position on the ECA mechanism, see the Direct Testimony of Larry Holloway

1 off-system sales margins.”³ Instead of using historical data to estimate the future costs,
2 KCPL wants to use year-ahead forecasts of these variables to set the ECA tariff. I will
3 only focus on the method and data KCPL uses to forecast its off-system sales margin.

4 **Q. How does Mr. Schnitzer forecast off-system sales margin?**

5 **A.** Mr. Schnitzer has a five step procedure for forecasting off-system sales margin.⁴

- 6 1. Use fuel (petroleum, natural gas, and coal) price, purchase power/wholesale
7 electricity price, load, and generation outage forecasts developed by KCPL.
8
- 9 2. Given the forecasts in 1, first calculate a daily incremental dispatch cost for each of
10 KCPL’s generation units and then determine an optimal dispatch order of these units.
11
- 12 3. Given planned and unplanned outages, long-term sales agreements and native load
13 obligations, for each generating unit, calculate the amount of capacity available for
14 making sales into the wholesale market.
15
- 16 4. Compare each unit’s dispatch cost with hourly forecasted market energy prices. If
17 dispatch cost is less than the forecasted market energy price, then assign that available
18 capacity to native load until native load is completely served. If any capacity remains
19 unassigned after native load is served, then assign the remaining capacity with
20 dispatch cost less than energy price to off-system sales.
21
- 22 5. For each generation unit available for making potential off-system sales, subtract the
23 marginal generation cost from the forecasted sale price in the wholesale market and
24 multiply that by the quantity of sales into the market. The result is the off-system
25 sales margin by unit. Sum the off-system sales margin for all units to give total off-
26 system sales margin.

27
28 The result of the five step process is a point forecast (a single number such as \$89
29 million) for off-system sales margin in 2008.⁵

30 **Q. Does KCPL think this point forecast for off-system sales margin is adequate?**

31 **A.** No. KCPL argues its situation requires a different type of forecast.

³ Mr. Giles’s testimony, p. 11.

⁴ Mr. Schnitzer’s testimony, pp. 16-17.

⁵ A standard point forecast of off-system sales margin would be the expected value of off-system sales margin at a particular time: it would be a single number such as \$89 million for 2008, \$95 million for 2009, etc. If the probability distribution estimated were symmetrical, a point forecast would be the 50th percentile. However, since the probability distribution is not symmetrical (see Schedules MM2 & 3 at the back of Mr. Schnitzer’s testimony) the expected value (mean or arithmetic average) is greater than the value of the 50th percentile.

1 **Q. Why is the point forecast inadequate for KCPL?**

2 **A.** Mr. Giles and Mr. Schnitzer identify three conditions which make the standard point
3 forecast for off-system sales inadequate for KCPL:

- 4 1. KCPL's off-system sales generate a significant portion of its revenue,
- 5 2. KCPL faces off-system sales prices with high volatility, and
- 6 3. If KCPL develops cash-flow problems, it thinks its bond rating will be revised down.

7 Mr. Giles and Mr. Schnitzer argue that nos. 1 and 3 above combine to make an economic
8 environment where a major overestimation of future off-system sales margin could create
9 financial problems for KCPL. The high volatility of the off-system sales price increases
10 the possibility of a major overestimation.

11 **Q. What solution does KCPL offer as an alternative to the point forecast?**

12 The solution offered by KCPL is to estimate a probability distribution of off-system sales
13 margin forecasts rather than just a single point estimated forecast. KCPL then proposes
14 to use that forecast value matching the 25th percentile forecast of the forecast distribution
15 as the numerical forecast sales margin to be credited through the ECA mechanism. This
16 solution greatly reduces the possibility of a major overestimation of off-system sales and,
17 thus, passing excess credits through the ECA mechanism. KCPL refers to this solution as
18 risk sharing, but a more accurate description is "risk shifting": shifting risk from
19 shareholders to customers.⁶

⁶ The ECA mechanism contains a true-up for off-system sales margin at the end of the year. The true-up allows ECA customers to eventually receive the entire off-system sales margin. Thus, KCPL's proposed "risk sharing" really amounts to a provision where KCPL shareholders capture the time value of money associated with KCPL's under estimated off-system sales margin amount.

1 **Q. How is the forecast probability distribution for off-system sales margin generated?**

2 A. Because of the complexity of Mr. Schnitzer's off-system sales forecast model, he is
3 unable to algebraically derive the forecast probability distribution. Instead, he uses
4 Monte Carlo Analysis.⁷

5 **Q. What is Monte Carlo Analysis?**

6 A. Monte Carlo Analysis, a form of probabilistic simulation, is a commonly accepted
7 technique for approximating forecast distributions. It starts with probability distributions
8 for each of the uncertain inputs, next the computer randomly chooses a particular value
9 for each input, then the model is run and a forecast value for the off-system sales margin
10 is calculated. This is one experiment. The process is repeated numerous times with the
11 computer choosing random values for the input variables each time. The result is a
12 distribution forecasted off-system sales margin amounts.⁸

13 **Q. How does Mr. Schnitzer apply Monte Carlo Analysis to his model?**

14 A. Rather than using the standard Monte Carlo Analysis outlined above, Mr. Schnitzer is
15 forced to use a more complex form of the technique. Step 1 of his 5 step methodology
16 for forecasting off-system sales margin involves using forecasts energy price, fuel price,
17 load, etc. These are the important, uncertain variables in his model.

18 However, at least some of these variables are significantly correlated. For
19 example, oil, natural gas, coal, and energy prices tend to move together. These prices are
20 not perfectly correlated, but they are significantly correlated. Taking these correlations
21 into account should improve the Monte Carlo Analysis.

⁷ The Monte Carlo technique is a result of the development of the electronic computer. It was formalized by mathematicians working on the nuclear bomb during World War II and named after the city in the Principality of Monaco famous for gambling. If developed today it would probably be known as the Las Vegas Method.

⁸ Savvakis C. Savvides, "Risk Analysis in Investment Appraisal," *Project Appraisal*, Vol. 9, No. 1 (March 1994): 3-18.

1 incorporate correlation between the variables simulated makes his application of Monte
2 Carlo Analysis even better.

3 It is my evaluation that, technically Mr. Schnitzer forecasting model is
4 appropriate.

5 **Reasonableness of the Resulting Numerical Forecast**

6 Forecasts of fuel prices and energy use are notoriously inaccurate. Major effects
7 in determining the future realized price of natural gas, petroleum and electricity are likely
8 to be unknown at the time that forecasts are made and by their nature not highly
9 predictable; for example, weather cannot be forecast with much accuracy for two weeks
10 in advance much less for 2008. Thus, the criterion for evaluating a forecast that includes
11 both fuel and energy prices is reasonableness. Staff has reviewed the petroleum, natural
12 gas, and coal forecasts and thinks those forecasts are reasonable.

13 The wholesale energy price forecasts are harder to evaluate. Mr. Burton L.
14 Crawford suggests an approach for evaluating wholesale energy price in his Direct
15 Testimony: “The power price forecasts are fairly accurate when the fuel price forecasts
16 are accurate, more specifically, when the natural gas price forecast is accurate. Natural
17 gas is the marginal fuel in North SPP more than 50% of the hours of the year, so there is
18 a strong correlation between natural gas and power in those hours.”⁹

19 Mr. Crawford’s approach implies that with expected natural gas prices lower in
20 2008, expected wholesale energy prices should also be lower in 2008. Off-system sales
21 margin is directly linked with wholesale energy prices so the decline in wholesale energy

⁹ Mr. Crawford’s testimony, pp. 4-5.

1 prices should reduce the off-system sales margin.¹⁰ Mr. Schnitzer has provided two
2 estimated distributions of the off-system sales forecast: this rate case and the previous
3 KCPL rate case.¹¹ Mr. Schnitzer's 25th percentile estimate of the forecast probability
4 distribution for off-system sales margin in this rate case is significantly less than his
5 estimate in the previous rate case. In addition, the expected decline in natural gas prices
6 has led to a leftward shift in the forecast probability distribution for off-system sales
7 margins from the previous rate case to the current rate case. Both of these results are
8 consistent with Mr. Crawford's suggestion of the relationship between natural gas prices
9 and wholesale energy prices.

10 My evaluation, Mr. Schnitzer's estimated forecast probability distribution for off-
11 system sales margin is reasonable.

12 **Conclusion**

13 Since the methodology used by Mr. Schnitzer is acceptable and the estimated
14 forecast probability distribution is reasonable, Mr. Schnitzer's estimate of the 25th
15 percentile of his forecast distribution is satisfactory. My one caveat about Mr.
16 Schnitzer's approach is that if the KCPL ECA mechanism is changed, or if the estimated
17 forecast probability distribution is used for another purpose, then the complexity of the
18 model needs to be reviewed: a simpler, more transparent, and easier to utilize forecast
19 model should be considered: increased complexity does not necessarily translate into
20 improved forecasts.

¹⁰ The casual relationship in Mr. Schnitzer's model between wholesale energy prices and off-system sales margin is muddied by the complexity of the model. Specifically, the multiple timing elements involved in hourly estimation of off-system sales margin means that lower wholesale energy prices might not necessarily translate into lower off-system sales margin. However, on average lower expected wholesale energy prices should generate lower expected off-system sales margin.

¹¹ Direct Testimony, Docket No. 06-KCPE-828-RTS.

1 **III. Performance of the Spearville Wind Farm**

2 **Q. Have you previously presented testimony on the Spearville Wind Farm before?**

3 **A.** I presented Direct Testimony on the Spearville Wind Farm (Spearville) in Docket No. 06-
4 KCPE-828-RTS.

5 **Q. What was the purpose of that testimony?**

6 **A.** I made two general and related recommendations:

- 7 1. Ratepayers and shareholders should share the operational risks associated with
8 Spearville, and
9
10 2. KCPL should be provided with an explicit incentive to maintain and possibly improve
11 the operation of and, thus, output levels at Spearville.
12

13 In that previous testimony, I expressed concerned about the productivity and cost
14 uncertainty associated with the operation of the Spearville and, therefore, I wanted to
15 ensure that KCPL had incentives to optimize Spearville’s operation. To that end I
16 proposed two mechanisms that would provide incentives for KCPL to operate the wind
17 farm efficiently and also share the risk for less efficient performance between
18 shareholders and ratepayers.

19 **Q. Why are you concerned about the incentives for KCPL to operate Spearville
20 optimally?**

21 **A.** A wind farm owned by a non-regulated entity has a strong incentive to optimize
22 production subject to cost of operation constraints. The ownership of the wind farm only
23 receives revenue from the production of electricity: the revenue from the sale and the
24 federal government production tax credit for each MWh produced. If the wind farm
25 under produces, then the ownership is out revenue. The situation for a regulated utility is

1 different after the wind farm has been accepted as part of rate base -- the need for revenue
2 from wind farm production is not as imperative.

3 **Q. How is the Spearville Wind Farm performing?**

4 **A.** Thus far, Spearville has performed poorly compared to the expected performance
5 described John R. Grimwade's in his Direct Testimony for the last rate case.¹² It is too
6 early to forecast the wind farm's long-run performance. Nearly every wind farm that I
7 have investigated has begun with mechanical problems. The early mechanical glitches
8 have two effects: they reduce generation of electricity because turbines are not available
9 for production and they inflate operations and maintenance costs. In addition,
10 Spearville's performance has been hindered by extreme events such as the winter ice
11 storm, which is not expected to be repeated every year. Finally, it is possible that output
12 at Spearville has been hurt by transmission constraints and forced interruptions.

13 Given these factors, it is hard to generalize from the available performance data
14 for Spearville. It is true that Spearville, as July 1, 2007, is generating less than 70% of
15 the electricity it was projected to produce in the previous rate case and as was forecasted
16 by KCPL for this year in this rate case.

17 **Q. Are you proposing the same mechanisms again for this docket?**

18 **A.** No. The Spearville Wind Farm is now up and running. The numerical details of the
19 mechanisms presented in my previous testimony were based on *ex ante* projected data for
20 the wind farm. Now, with the wind farm operational, performance mechanisms should
21 reflect actual performance data. At this point, I think it is best to collect data on the
22 performance of Kansas wind farms, use the data to monitor and evaluate the performance
23 of the Spearville Wind Farm, and based on this evaluation, possibly develop new,

¹² Mr. Grimwade's Direct Testimony, Docket No. 06-KCPE-828-RTS, p. 5.

1 appropriate performance mechanism for Spearville. Staff will keep the Commission
2 apprised of all Spearville performance issues.

3 **Q. At this point in time, do you have any recommendations to make for the Spearville**
4 **Wind Farm?**

5 **A. No.**

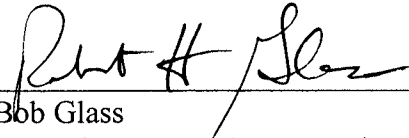
6 **Q. Does that conclude your testimony?**

7 **A. Yes.**

STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

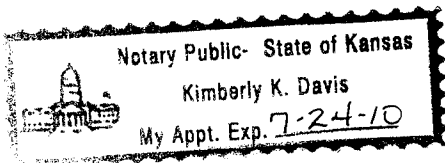
VERIFICATION

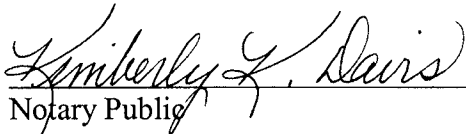
Bob Glass, being duly sworn upon his oath deposes and says that he is the Managing Research Economist in the Utilities Division of the Kansas Corporation Commission; that he has read and is familiar with the foregoing *Direct Testimony*, and that the statements therein are true to the best of his knowledge, information and belief.



Bob Glass
Managing Research Economist
State Corporation Commission of the
State of Kansas

Subscribed and sworn to before me this 3rd day of August, 2007.





Notary Public

My Appointment Expires: July 24, 2010

CERTIFICATE OF SERVICE

07-KCPE-905-RTS

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing Direct Testimony was placed in the United States mail, postage prepaid, or hand-delivered this 3rd day of August, 2007, to the following:

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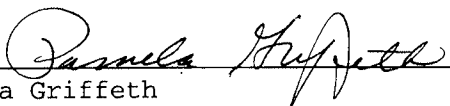
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