Exhibit No.:
Issue: Natural Gas Prices
Witness: Stan M. Kaplan
Type of Exhibit: Direct Testimony
Sponsoring party: The Empire District Electric Company
Case No: ER-2001-299
Date testimony prepared: May 2, 2001

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

REBUTTAL TESTIMONY OF

STAN M. KAPLAN

ON BEHALF OF

THE EMPIRE DISTRICT ELECTRIC COMPANY

Jefferson City, Missouri

May 3, 2001

Exhibit No. 19
Date 5/29/01 Case No. ER-2001-299
Reporter KEM

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Introduction

Q. Please state your name, business address and business affiliation.

A. My name is Stan M. Kaplan. I am a Managing Consultant with PA Consulting Group, a provider of energy and transportation consulting services. My business address is 1776 I Street, NW, Suite 600, Washington, D.C. 20006.

Q. Are you the same Stan Kaplan who previously filed testimony in this case?

A. Yes.

Q. What is the purpose of your current testimony?

A. The purpose of my current testimony is to rebut the testimony of staff witnesses Kwang Choe and V. William Harris, and Office of Public Counsel (OPC) witness James Busch, in respect to the natural gas prices that should be used to set rates in this case.

Q. How is your testimony organized?

A. The remainder of my testimony is divided into four sections. The first three sections address in turn the testimony of Messrs. Choe, Harris and Busch. The fourth section continues my rebuttal of the staff and OPC arguments by presenting analyses of the performance to date of the staff, OPC and Empire District Electric Co. (Empire) gas price forecasts, and of the historical performance of the gas futures as an indicator of actual gas prices.

Rebuttal of the Testimony of Staff Witness Choe

Q. Please summarize the testimony of Mr. Choe.

A. As I understand it, the main point of Mr. Choe's testimony is that gas futures should not be used to set fuel rates (as Empire has proposed). He states that "the futures market is not the best forecasting tool for predicting actual future natural gas prices, and therefore, should not be used for forecasting in the ratemaking process." (p. 2, lines 9 – 11)

Mr. Choe notes that gas futures exist because the price of gas is highly uncertain, and in fact futures would not be needed except for this uncertainty (p. 3, lines 6-12). However, Mr. Choe then concludes that "the gas futures market is in no way [sic] to accurately predict that there will be a certain price prevailing in the future." (p. 3, lines 12 and 13) This is because there is "no significant correlation between" futures prices and actual market prices. (p. 4, line 4).

Q. Do you believe Mr. Choe makes a convincing case that gas futures are a poor means of forecasting the price of gas?

A. No. Mr. Choe's arguments contain inconsistencies, conclusions unsupported by quantitative analysis, and citations to academic studies that contradict Mr. Choe's own conclusions.

It is indicative of the lack of rigorous analysis in Mr. Choe's testimony that at one point he asks himself whether the "futures market [can] *always* correctly predict the actual" price of natural gas (p. 4, lines 12 and 13; emphasis added) To this

question he naturally answers "no." Obviously, neither the futures or any other approach will *always* predict accurately the price of gas; if this was possible, there would be no need for futures prices since there would be no uncertainty to manage.

Mr. Choe is begging the real question, which is whether futures are a reasonable means of forecasting prices. I do not believe his testimony effectively addresses this question.

Q. What quantitative analysis does Mr. Choe offer to support his conclusion that "there is no systematic correlation between [futures and actual spot] prices" (page 4, line 4)?

A. Mr. Choe offers no quantitative analysis to support his conclusion. As proof of the absence of correlation, he simply points to his Schedule 2, a graph that shows that while spot prices have been volatile, the futures price series (apparently as of May 2000) has been fairly stable. (I have attached Mr. Choe's Schedule 2 as Schedule SMK-1.)

Q. Is this a good approach for reaching conclusions concerning the relationship between futures prices and actual spot prices?

A. No. In fact Mr. Choe's approach is a very dubious approach, since he is making use of the futures price series as it stood as of one month -- May 2000 -- to generalize to all futures prices.

Q. Does Mr. Choe attempt to use economic theory to support his rejection of gas futures as a means of forecasting actual spot prices?

A. Yes. In support of his conclusion that the futures market cannot correctly predict the actual price of gas, Mr. Choe raises the "efficient market theory." His notion is that if the gas futures market is "efficient," the futures price will reflect all available relevant information concerning developments (actual and expected) that impact gas prices, and will therefore accurately predict gas prices. He concludes that "Unfortunately, this is not always the case" (page 5, line 1). He reaches this conclusion based on his Schedules 3 and 4, which he argues provides visual evidence of significant deviations between the futures and actual gas prices.

Q. Does Mr. Choe make an effective case for rejecting the use of gas futures as a forecasting tool based on his application of the efficient market theory?

A. No, he does not. There are several points to note about Mr. Choe's argument.

First, Mr. Choe's argument is contradicted by his own citation. One of the sources cited by Mr. Choe, a 1995 article from *The Energy Journal*, concludes that:

> *...the natural gas futures market is generally consistent with the efficient markets hypothesis; that is, the futures market price is an unbiased predictor of the future spot price at the delivery location.* It was also found that the futures market price was an unbiased predictor, up to transmission

> costs, of spot prices at most of the other market locations examined. The futures market is an economic success in that it allows a wide range of diverse participants to exchange the risk of future price fluctuations in an informationally efficient market. [emphasis added][1]

This conclusion appears to directly contradict Mr. Choe's effort to show that natural gas futures are a poor predictor of market prices and are inconsistent with efficient market theory. It is true that the article focuses on gas futures as a means of predicting spot prices only 30 days ahead, not months ahead. Nonetheless, the article reaches a conclusion directly opposite to that offered by Mr. Choe.

Q. Does Mr. Choe offer any quantitative support for his conclusion that the efficient market theory argues against using futures prices as a predictor of actual spot prices?

A. As noted above, the only quantitative support Mr. Choe offers is a visual inspection of this Schedules 3 and 4 (reproduced as my Schedules SMK-2 and – 3.) I would argue that Mr. Choe's Schedules 3 and 4 show that during the periods reviewed, futures prices were either close to actual prices, or far below the actual price. The same, in fact, can be said of his Schedule 2 (see SMK-1). Mr. Choe's schedules support the conclusion that futures prices are, depending on the time

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[1] Walls, David W, "An Econometric Analysis of the Market For Natural Gas Futures," *The Energy Journal*, Vol. 16, No. 1, January 1995

period examined, either a reasonably accurate predictor of spot prices, or a conservative measure of actual prices and therefore favorable to ratepayers.

Q. Does Mr. Choe criticize the use of natural gas futures on other grounds?

A. Yes. On page 5 of his testimony he makes two related points. First, he refers to "another characteristic of the futures market; namely, its inherent volatility." (lines 5 and 6) He then goes on to note that "Using futures market prices to determine natural gas prices for fuel expense places substantial risk on the customers in that any overstatement will be a windfall to the Company in higher fuel costs." (lines 14 – 16)

Q. Does Mr. Choe's testimony support his concerns about the volatility of futures prices and the risk of futures prices overstating actual prices?

A. No, his testimony does not support these points. First, Mr. Choe cannot seem to decide whether or not volatility in futures prices is a good thing, or even if it exists. As noted immediately above, at page 5, lines 5 to 7, Mr. Choe concludes that the gas futures market is volatile. However, this finding directly contradicts his conclusion at page 4, line 8 that the "futures market predicts a fairly stable price trend going forward..." Moreover, on page 4 he puts forth the argument that the lack of volatility in gas futures is a problem because futures prices therefore do not track the variation in actual spot prices. But on page 5 the volatility in spot prices is a negative because it creates the risk of overstatements that will hurt ratepayers.

Finally, Mr. Choe's own Schedules 2, 3 and 4 (See Schedules SMK-1, -2, and –3) show that to the extent that futures prices have diverged from actual spot prices, the overstatements have been relatively small while the understatements – that is, the futures price is far *below* the spot price – have been very large. These understatements would put the company at risk, a contingency Mr. Choe never discusses.

Q. Please summarize your critique of Mr. Choe's testimony.

A. The logic behind Mr. Choe's conclusions is difficult to fathom. He alternatively states that natural gas prices are and are not volatile, and that this volatility is and is not a good characteristic of natural gas futures from a forecasting standpoint. His criticism of gas futures from the standpoint of the "efficient market theory" is directly contradicted by his own citation. Although he raises the risk of gas futures overstating actual gas prices, the graphics he presents indicate that the real risk is that futures will understate actual gas prices.

Mr. Choe observes that "Natural gas futures prices are based on demand for and supply of the commodity in the future." (p. 3, lines 5 and 6) This is of course exactly what a good forecast should do. In summary, one could use Mr. Choe's arguments and data to support gas futures as a conservative forecasting tool likely to be favorable to ratepayers.

Rebuttal of the Testimony of Staff Witness Harris

Q. What method did Mr. Harris use to project gas prices for ratemaking purposes?

A. Harris states that staff reviewed Empire gas prices dating back to January 1991, and from this work concluded that gas prices are "very volatile." (page 9, line 22) Accordingly, the Staff believes that the use of a three-year average price for each month…is necessary to smooth out these fluctuations."

Q. Does the use of a three-year price average for each month accomplish the stated objective of reducing volatility in the prices proposed for rates?

A. No. If the smoothing of fluctuations is a key ratemaking goal, Mr. Harris' approach is far less successful than the Company's use of futures prices.

Q. What is the basis for your conclusion concerning the relative volatility of the staff and Empire gas price projections?

A. The basis for my conclusion is a comparison of the two price series, as described below.

Table 1 (below) compares the average, standard deviation and difference between the minimum and maximum monthly prices for the staff and EDE price projections. The staff average price is lower[2], but the standard deviation and min-max difference are more than five times higher:

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[2] Mr. Harris developed a monthly average *delivered* price for gas to Empire. To be consistent, the Empire prices shown above are also on a delivered basis (i.e., the prices account for the monthly demand charge of $482,586, of which 60% -- $289,552 – is the responsibility of Empire). See Schedule SMK-4 for the monthly values.

Table 1
Measures of Volatility in Staff and EDE Gas Price Projections

	Staff	EDE (Delivered Price)
Mean	$4.008	$5.070
Standard Deviation	$1.614	$0.298
Difference (in Dollars) Between Maximum and Minimum Monthly Prices	$5.592	$0.992

Q. Did you perform any other comparisons of the relative volatility of the staff and Empire price series?

A. Yes. The much greater volatility of the staff forecast can be seen in the following two graphs and supporting schedule. The first is simply a plot of the staff and EDE price forecasts. The second is a plot of the month-to-month percentage changes in each forecast. In each case the far greater variability of the staff forecast is obvious. (The values underlying the graphs are found in Schedule SMK-4.)

Figure 1
Comparison of Staff and EDE Gas Price Forecasts

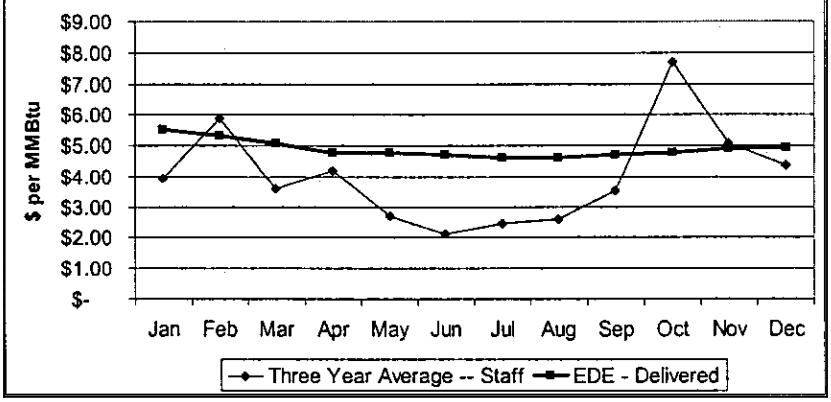
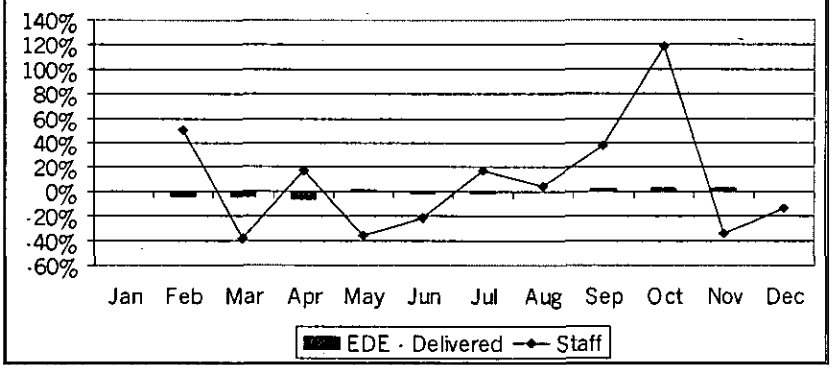


Figure 2
Comparison of Month-to-Month Percentage Changes in Staff and EDE Gas Price Forecasts



Q. Is Mr. Harris' use of the three-averaging technique consistent with the testimony of staff witness Choe?

A. No. One reason that Mr. Choe gives for rejecting the use of gas futures in ratemaking is the "inherent volatility of the gas futures market." (Choe, p. 6, lines 2 and 3) This criticism seems to be more applicable to the forecast proffered by the Staff.

In short, to the degree that fuel price stability in itself is an important rate-making goal, the EDE projection achieves this objective far better than the Staff approach.

Q. Does Mr. Harris provide any rationale for the use of the three-year averaging technique other than to reduce volatility?

A. No. No rationale is presented for the use of a three-year average, other than to "smooth out...fluctuations." Staff witness Choe lists the factors that affect natural gas prices, including oil prices, the weather, drilling rig counts, demand from

combustion turbines, national gas storage levels, the level of economic activity, and psychological factors. (Choe, p. 3, lines 15 – 19) Mr. Harris references none of these factors.

Q. Are there other inconsistencies between the testimony of Mr. Harris and Mr. Choe?

A. Yes. Mr. Choe criticizes the use of gas futures as a forecasting approach because they do not (in his view) meet the test of the efficient market theory; i.e., the futures market fails to contain "all available relevant information regarding the actual natural gas price in the future, and, as such, permits a correct forecast of the future actual price." (Choe, p. 4, lines 18 – 20) It is difficult to conceive of how the three year average of historical prices used by Mr. Harris could meet this test.

Q. Please summarize your critique of Mr. Harris' testimony.

A. Mr. Harris' testimony, which argues for using a three-year average gas price, rests entirely on assertion. No analytical support is offered for this approach, and no reference is made to the price-determining factors listed by Staff Witness Choe in his gas testimony. Mr. Harris' stated objective is to smooth-out gas price volatility; however, as show above, the gas prices recommended by Empire are far less volatile than Mr. Harris'.

Rebuttal of the Testimony of OPC Witness Busch

Q. What natural gas price projection is recommended by Mr. Busch for ratemaking purposes?

A. Mr. Busch recommends using an average gas price of $3.912 per MMBtu, apparently for all months. The price is based on the average of two years of actual spot gas costs (January 1999 – December 2000) and the 24-month futures strip (May 2001 – April 2003) as of March 30, 2001. He uses this "hybrid approach of historical and future data in recognition of the volatility of the natural gas market. I believe it is important to use both historical and future information to arrive at the appropriate natural gas cost to build into rates." (p. 3, lines 3 – 6)

Q. Does Mr. Busch document the advantages of this hybrid approach?

A. No. Mr. Busch asserts that "combining the past with the future provides a better basis for establishing the level of natural gas costs to be reflected in the Company's rates in this case" (page 3, lines 8 – 10) but offers no analytical support for this conclusion.

Q. Is including two years of historical prices in the gas forecasting calculation likely to increase the reliability of the forecast?

A. Under current market conditions, probably not. Beginning in 2000 gas prices began a dramatic rise. As I explained in my earlier testimony in this case, the run-up in prices reflected fundamental changes in the market, such as low levels of gas exploration activity, which may take years to correct. It is likely that gas

prices will stay well above $4.00 per MMBtu through 2001 and 2002. In this circumstance, including in the forecast calculation months when prices were low and the market outlook very different, will likely have the effect of understating future gas prices.

Q. Does Mr. Busch suggest that his forecasting approach offers advantages to ratepayers?

A. Yes. Mr. Busch states that "Under my recommendation, the ratepayers and Company shareholders will share in the inherent price risk of procuring natural gas." (p. 3, lines 22-23) It is not clear why this characteristic is unique to his approach.

Q. Has Mr. Busch elaborated on the risk-sharing advantages he sees in his hybrid approach?

A. Yes, in the response to Data Requests 1F (i) and (ii) from Empire, as shown below:

1F. You state (p. 3, lines 22 - 23) that "under my recommendation, the ratepayers and Company shareholders will share in the inherent price risk of procuring natural gas." In relation to this statement:

i) Please explain completely and fully how you[r] approach accomplishes this risk sharing.

ii) Is this risk sharing also a characteristic of the Company's approach to determining gas prices for rates? If not, please completely explain why it is not.

Response:

i) Under this approach, ratepayers would have opportunities to benefit from a lower price of natural gas that [sic] the Company is allowed to recover, while the Company would have the opportunity to realize benefits if the price of natural gas falls below the established price level.

ii) No. Under the Company's approach, the ratepayers will be locked out of any potential benefits. By basing rates solely on the futures strip, the Company will lock in at levels at or below the futures strip, keeping the price below the built in level at all times.

Q. Do you agree with Mr. Busch's conclusion that his hybrid approach shares risks between the ratepayers and Company, while Empire's approach stacks the deck in the Company's favor?

A. No, Mr. Busch is in error. If the Company was to "lock in at levels at or below the futures strip[3]" and this price was below that embedded in rates, the Company's shareholders could benefit. However, the shareholder's risks are by no means eliminated. For example, there are still uncertainties as to what volume of gas will be needed -- the "locked-in" volume could be too much or too little. If Empire acquires too much gas at the futures price, and the actual market price drops, the shareholders will be left holding the bag.

Note that if the market price of gas was to exceed the "locked-in" futures strip, the ratepayers are protected by the fixed fuel charge embedded in rates and the shareholders are protected by the locked-in price. Both the shareholders and the ratepayers benefit from forms of price protection.

[3] Although not explicit in his testimony or Data Request response, presumably Mr. Busch anticipates that the Company would lock-in a gas price either by entering into a supply contract at the futures price or by using futures to financially hedge its price risks.

Q. In his response to the Data Request, Mr. Busch appears to suggest that Empire can lock in its gas prices only if the futures strip is used to set rates. Is this correct?

A. No. The ability to lock-in at a price is not, as Mr. Busch suggests, dependent on using the futures prices to set the fuel component of rates. Mr. Busch has recommended a price of $3.912 per MMBtu. If the futures price strip in upcoming months declines to this level, Empire could lock-in at this price and accomplish the same risk abatement that Mr. Busch seems to criticize.

Q. Do the ratepayers, in fact, face different types of risks under the Empire and hybrid methods of establishing the fuel component of rates?

A. No. It is the shareholders who face different – and greater – risks under the hybrid approach.

The ratepayers are in the same situation under the Empire or hybrid approaches to forecasting gas prices. In both cases the Commission will decide on the appropriate fuel charge and build it into rates. If actual prices go below that level the shareholders could benefit; if actual prices are higher than forecast, the ratepayers are protected.

From the shareholders standpoint, the issue is whether the fuel charge is set at a level consistent with the actual cash and futures market. If it is, then Empire can indeed lock in prices. This protects the shareholders against unexpected price increases. *The effect of the hybrid approach is to stack the deck against the Company, by setting a unrealistically low price that Empire would find it difficult*

to hedge. Under current market conditions, the hybrid approach will likely set an unrealistically low fuel charge that will make it difficult for Empire to hedge its risks, and therefore expose shareholders to the consequences of gas prices that rise above the forecast.

Q. Has Mr. Busch taken into account all of Empire's natural gas costs?

A. No. In addition to the cost of the gas itself (often referred to as the "commodity" cost), Empire must pay to transport the gas to its generating plants. These costs, which total about $3.5 million per year, have been ignored altogether by OPC.[4]

Q. Please summarize your critique of Mr. Busch's testimony.

A. Mr. Busch suggests a "hybrid" approach to forecasting gas prices that, in the current market environment, would substantially base Empire's fuel charge on unrealistically low historical gas prices. By imposing a low gas price on Empire, the hybrid approach would make it difficult for Empire to hedge its gas costs, therefore increasing shareholder risks without any symmetrical sharing of risks by ratepayers. Moreover, the gas rate suggested by OPC ignores about $3.5 million in costs that Empire will incur to transport gas to its power plants.

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[4] According to the response to Empire Data Request 1H, "Natural gas transportation costs have not been addressed by Public Counsel at this time."

Forecast Analyses

Q. As part of your rebuttal to Mr. Choe's testimony, have you performed additional quantitative analysis of the reasonableness of using the gas futures strip to forecast actual spot price?

A. Yes.

Q. Please describe your analysis.

A. To further confirm the reasonableness of the futures strip as a forecast of actual spot prices, I made a comparison between an extensive data base of futures strips and spot prices. Specifically:

- I based my study on a database which includes the futures strip as it stood on the first business day of each month from October 1995 through February 2001.[5] (As described in my earlier testimony, a futures "strip" is simply the series of futures prices, as they stand on given date, for each month out.[6])

- For each futures strip included in the database, I compared each month's price with the actual Henry Hub spot price for that month, and calculated the percentage difference.

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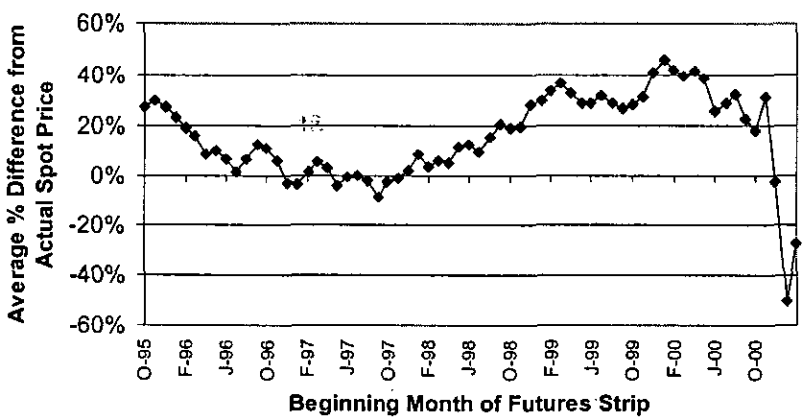
[5] The dates extend from six years back from the likely operation of law date for the current case through the most recent information that could be compiled.

- I then averaged the monthly percentage differences from actual for each futures strip. This created for each futures strip its average difference from actual gas prices for the period of time encompassed by the strip.

Figure 3 and Schedule SMK-5 present the results of this study. As the figure and schedule show, through 1998 the futures and actual spot prices tracked reasonably well, with the percent differences within a 20% error band. In 1999 and 2000, as the volatility in the gas market increased the average errors also increased substantially, peaking above 40%. Since mid-2000, perhaps as market participants better adjusted to the new shape of the market, the average errors have generally been declining.

Figure 3
Futures Prices vs. Actual Spot Prices
Average Percentage Differences



[6] Currently the futures strip extends out 36 months. The strip has been shorter in the past.

Q. What conclusions do you draw from this analysis?

A. There are two conclusions that I would emphasize. First, the futures prices are indeed a reasonable predictor of actual spot prices. The reliability of the futures-based forecast clearly deteriorated as market conditions changed, but since mid-2000 the percentage errors have been generally declining. Given the difficulty in forecasting gas prices, the error range of 20% or less observed during most of the study period is, in my view, very reasonable. This finding is the opposite of what Mr. Choe's testimony would suggest.

Second, during the study period the net errors were for the most part positive; that is, the futures price *understated* the actual spot price. This reinforces the conclusion that futures prices have historically been a conservative predictor of actual gas prices.

Q. Is it assured that futures prices will consistently understate actual spot prices in the upcoming months?

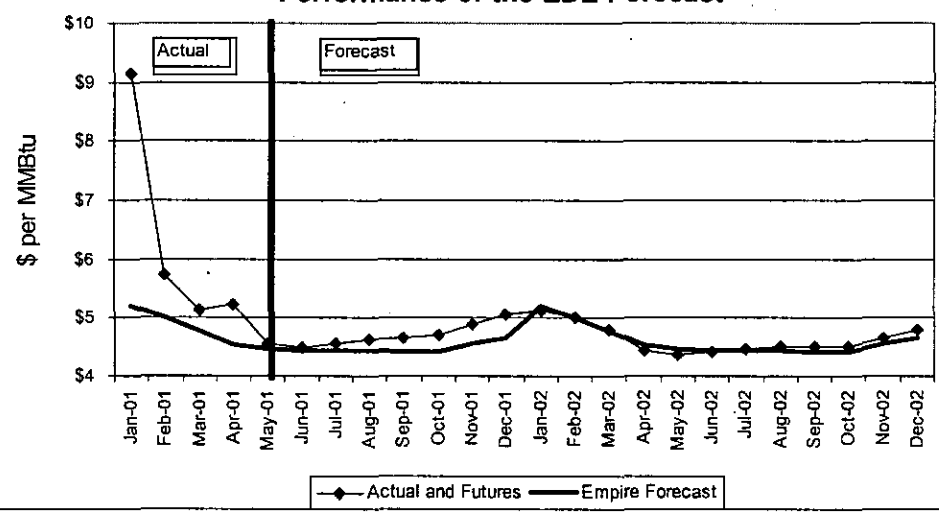
A. No, this is not assured. What is clear is that *historically* the futures prices have understated actual prices, which suggests that there is a significant chance that a futures-based fuel charge will ultimately work to the advantage of ratepayers.

Q. Have you performed any further analysis as part of your rebuttal testimony?

A. Yes. As part of my rebuttal of the testimony of Messrs. Choe, Harris and Busch, I have performed a comparison of the staff and OPC gas price forecasts with the Empire forecast and actual experience to date.

Figure 4 and Schedule SMK-6 compare the Empire forecast with actual prices through May 2, 2001, and subsequently with the futures strip as it closed on May 2. The graph and schedule clearly indicate that the Empire forecast is tracking closely with actual prices and the most recent futures strip.

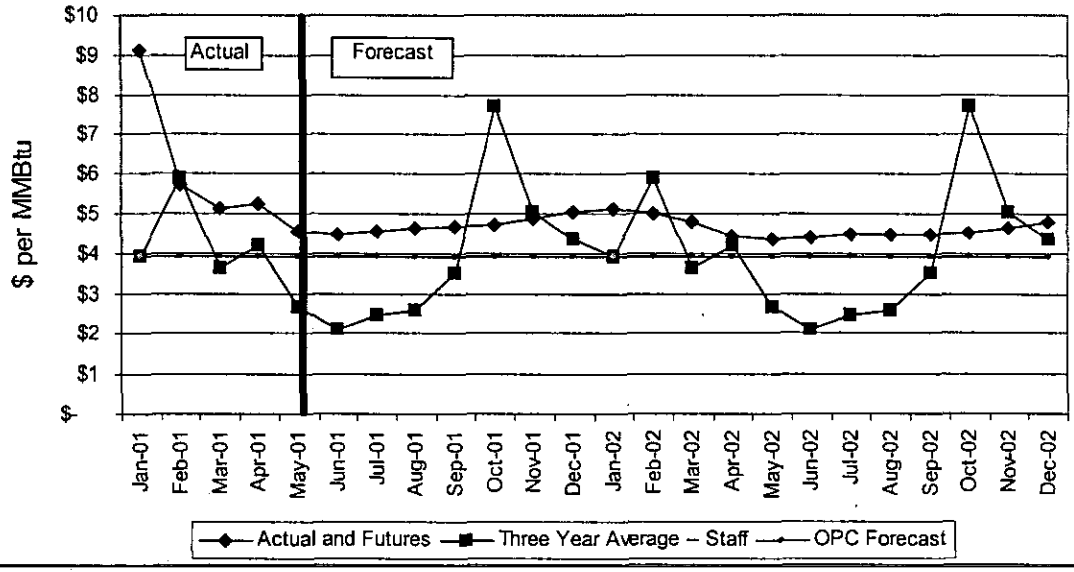
Figure 4
Performance of the EDE Forecast



Q. Have you performed any additional forecast comparisons?

A. I have also compared the staff and OPC forecasts to actuals to date and the most recent futures series. As shown in Figure 5 and Schedule SMK-6, these forecasts are diverging significantly from current price trends. This is particularly true of the staff forecast.

Figure 5
Forecast Comparisons

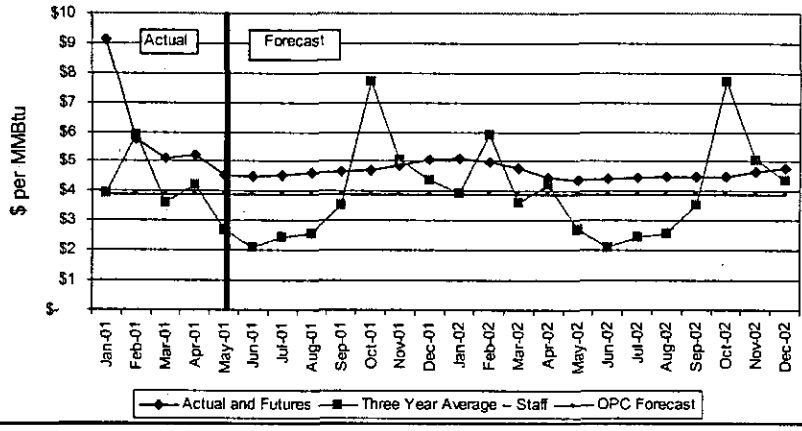


Q. Does this conclude your rebuttal testimony at this time?

A. Yes.

A. Yes.

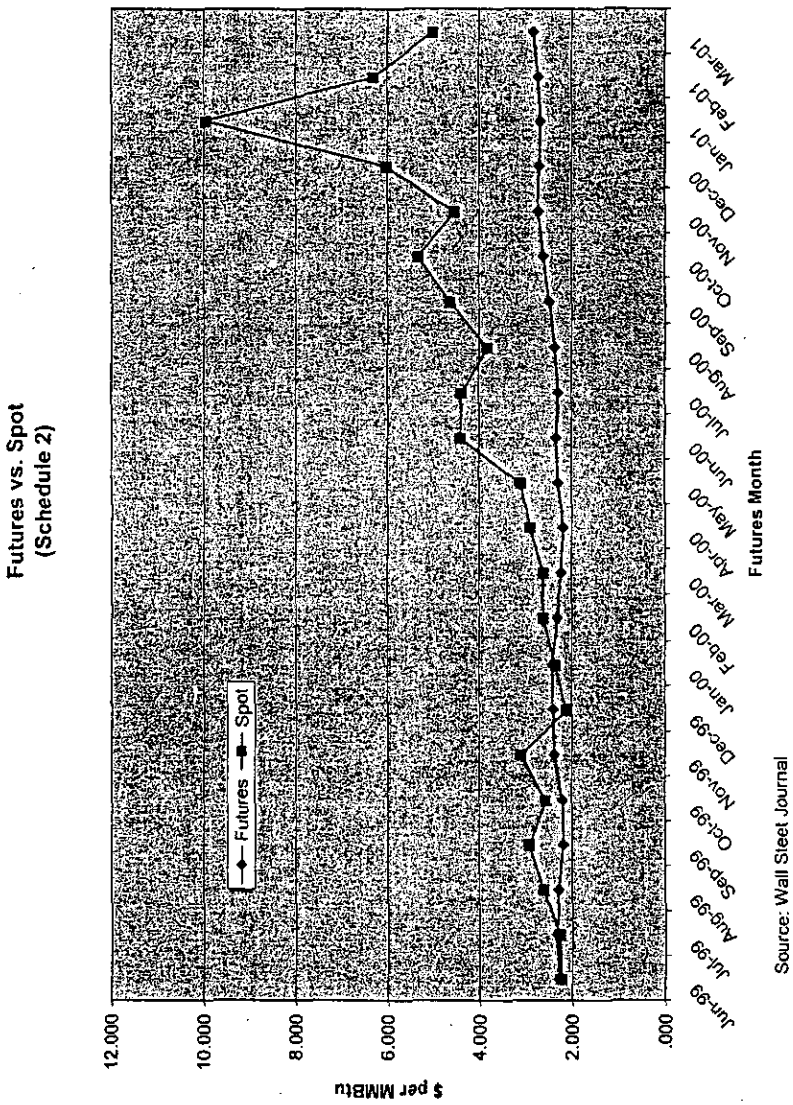
Figure 5
Forecast Comparisons



Schedule SMK-1

Reproduction of Mr. Choe's Schedule 2

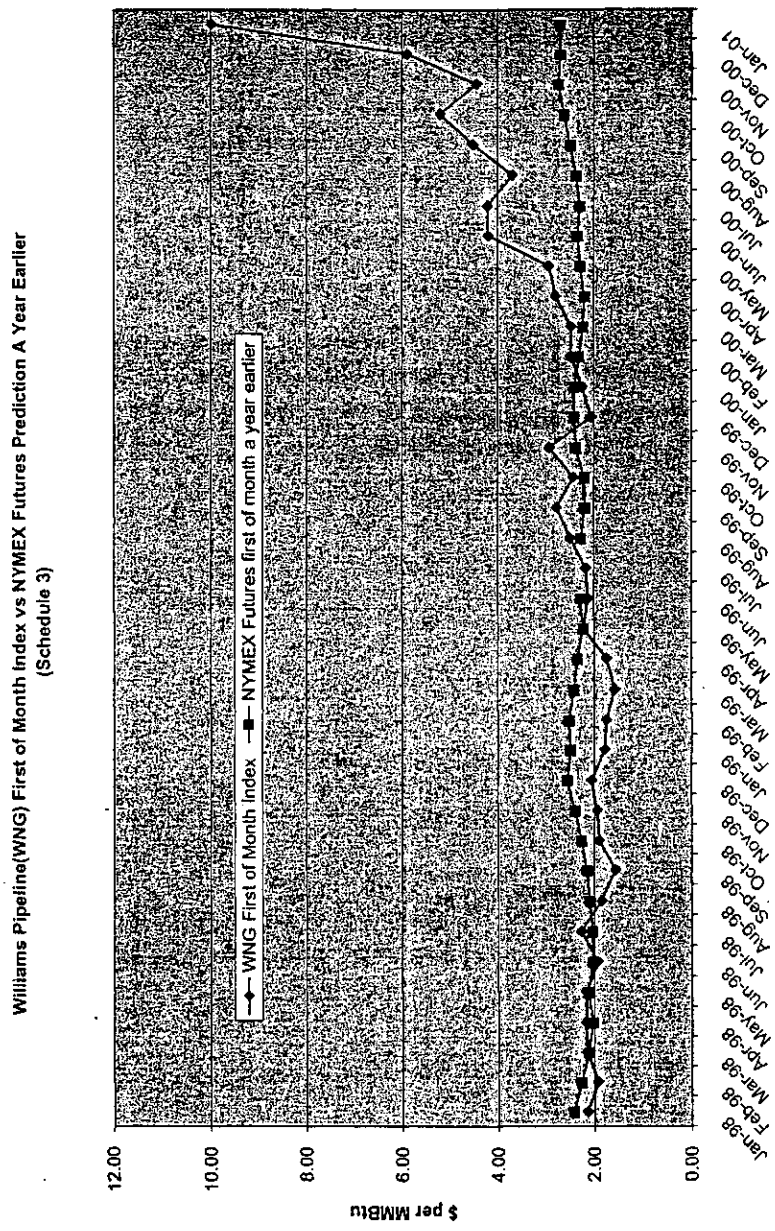
Schedule 2



Source: Wall Steet Journal

Schedule SMK-2

Reproduction of Mr. Choe's Schedule 3

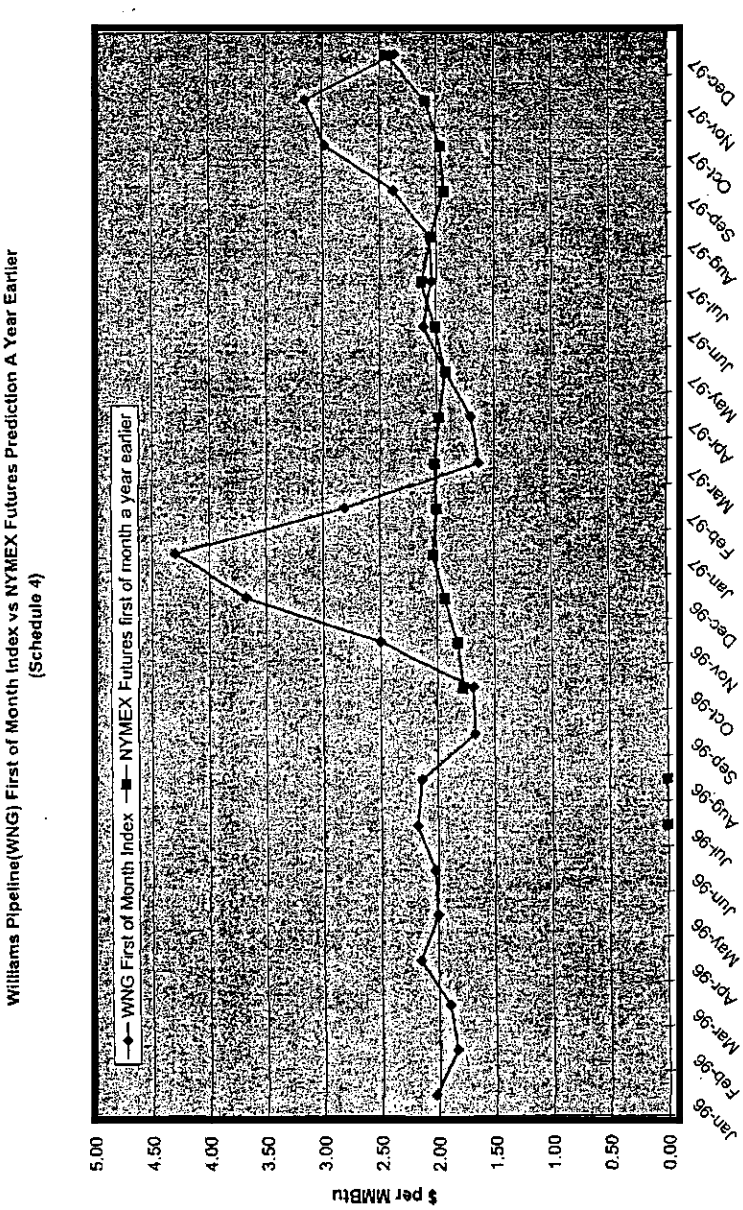


Source: Wall Street Journal and Inside FERC's Gas Market Report

Schedule 3

Schedule SMK-3

Reproduction of Mr. Choe's Schedule 4



Source: Wall Street Journal and Inside FERC's Gas Market Report

Schedule 4

Schedule SMK-4

Review of Staff Gas Price Projection

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Sources: Staff Testimony: Summary of Fuel Prices (File "F-PRICE"; Sheet "Summary")
Natural Gas Week; Wall Street Journal On-Line; MMBtus supplied by EDE.

	Three Year Average -- Staff	Actual Henry Hub Through April; May is Cash Price on 5/2//01; then Futures Strip	Futures Prices Used by EDE	Monthly MMBtus	Monthly Demand Charge	Demand Charge Per MMBtu	Total Delivered Price per MMBtu
Jan-01	$ 3.931	$ 5.130	$ 5.210	958,932	$ 289,552	$ 0.30	$ 5.51
Feb-01	$ 5.892	$ 5.730	$ 5.005	1,017,923	$ 289,552	$ 0.28	$ 5.29
Mar-01	$ 3.610	$ 5.120	$ 4.770	985,328	$ 289,552	$ 0.29	$ 5.06
Apr-01	$ 4.211	$ 5.230	$ 4.535	1,296,995	$ 289,552	$ 0.22	$ 4.76
May-01	$ 2.675	$ 4.550	$ 4.455	909,147	$ 289,552	$ 0.32	$ 4.77
Jun-01	$ 2.101	$ 4.483	$ 4.430	1,084,039	$ 289,552	$ 0.27	$ 4.70
Jul-01	$ 2.462	$ 4.553	$ 4.425	1,608,369	$ 289,552	$ 0.18	$ 4.61
Aug-01	$ 2.571	$ 4.623	$ 4.425	1,626,307	$ 289,552	$ 0.18	$ 4.60
Sep-01	$ 3.523	$ 4.658	$ 4.415	1,052,026	$ 289,552	$ 0.28	$ 4.69
Oct-01	$ 7.693	$ 4.698	$ 4.420	793,750	$ 289,552	$ 0.36	$ 4.78
Nov-01	$ 5.055	$ 4.878	$ 4.555	794,935	$ 289,552	$ 0.36	$ 4.92
Dec-01	$ 4.366	$ 5.050	$ 4.650	1,061,962	$ 289,552	$ 0.27	$ 4.92

	Staff	EDE - Delivered
Mean	$ 4.008	$ 4.885
StDev	$ 1.614	$ 0.280
Max - Min	$ 5.592	$ 0.909

Schedule SMK-5
Page 1 of 1

Average Differences Between Futures Strips and Actual Henry Hub Spot Prices

Oct-95	27%	Jan-99	30%
Nov-95	29%	Feb-99	33%
Dec-95	27%	Mar-99	36%
Jan-96	23%	Apr-99	33%
Feb-96	19%	May-99	28%
Mar-96	16%	Jun-99	28%
Apr-96	8%	Jul-99	31%
May-96	10%	Aug-99	28%
Jun-96	6%	Sep-99	27%
Jul-96	1%	Oct-99	28%
Aug-96	6%	Nov-99	31%
Sep-96	12%	Dec-99	41%
Oct-96	11%	Jan-00	46%
Nov-96	6%	Feb-00	42%
Dec-96	-3%	Mar-00	40%
Jan-97	-4%	Apr-00	41%
Feb-97	1%	May-00	38%
Mar-97	5%	Jun-00	25%
Apr-97	3%	Jul-00	28%
May-97	-4%	Aug-00	32%
Jun-97	-1%	Sep-00	22%
Jul-97	0%	Oct-00	18%
Aug-97	-2%	Nov-00	31%
Sep-97	-9%	Dec-00	-3%
Oct-97	-3%	Jan-01	-51%
Nov-97	-1%	Feb-01	-28%
Dec-97	2%		
Jan-98	8%		
Feb-98	3%		
Mar-98	6%		
Apr-98	5%		
May-98	11%		
Jun-98	12%		
Jul-98	9%		
Aug-98	15%		
Sep-98	20%		
Oct-98	19%		
Nov-98	19%		
Dec-98	28%		

Note: a positive value denotes that the actual spot price has on average exceeded the futures price strip.

Schedule SMK-6

Forecast Comparisons

	Actual Values				Percentage Differences from Actual and Futures		
	Actual and Futures (1)	Three Year Average -- Staff	Futures Prices Used by EDE	OPC Forecast	Three Year Average -- Staff	Futures Prices Used by EDE	OPC Forecast
Jan-01	$ 9.130	$ 3.931	$ 5.210	$ 3.912	-57%	-43%	-57%
Feb-01	$ 5.730	$ 5.892	$ 5.005	$ 3.912	3%	-13%	-32%
Mar-01	$ 5.120	$ 3.610	$ 4.770	$ 3.912	-29%	-7%	-24%
Apr-01	$ 5.230	$ 4.211	$ 4.535	$ 3.912	-19%	-13%	-25%
May-01	$ 4.550	$ 2.675	$ 4.455	$ 3.912	-41%	-2%	-14%
Jun-01	$ 4.483	$ 2.101	$ 4.430	$ 3.912	-53%	-1%	-13%
Jul-01	$ 4.553	$ 2.462	$ 4.425	$ 3.912	-46%	-3%	-14%
Aug-01	$ 4.623	$ 2.571	$ 4.425	$ 3.912	-44%	-4%	-15%
Sep-01	$ 4.658	$ 3.523	$ 4.415	$ 3.912	-24%	-5%	-16%
Oct-01	$ 4.698	$ 7.693	$ 4.420	$ 3.912	64%	-6%	-17%
Nov-01	$ 4.878	$ 5.055	$ 4.555	$ 3.912	4%	-7%	-20%
Dec-01	$ 5.050	$ 4.366	$ 4.650	$ 3.912	-14%	-8%	-23%
Jan-02	$ 5.118	$ 3.931	$ 5.210	$ 3.912	-23%	2%	-24%
Feb-02	$ 4.998	$ 5.892	$ 5.005	$ 3.912	18%	0%	-22%
Mar-02	$ 4.793	$ 3.610	$ 4.770	$ 3.912	-25%	0%	-18%
Apr-02	$ 4.443	$ 4.211	$ 4.535	$ 3.912	-5%	2%	-12%
May-02	$ 4.371	$ 2.675	$ 4.455	$ 3.912	-39%	2%	-11%
Jun-02	$ 4.413	$ 2.101	$ 4.430	$ 3.912	-52%	0%	-11%
Jul-02	$ 4.463	$ 2.462	$ 4.425	$ 3.912	-45%	-1%	-12%
Aug-02	$ 4.495	$ 2.571	$ 4.425	$ 3.912	-43%	-2%	-13%
Sep-02	$ 4.495	$ 3.523	$ 4.415	$ 3.912	-22%	-2%	-13%
Oct-02	$ 4.511	$ 7.693	$ 4.420	$ 3.912	71%	-2%	-13%
Nov-02	$ 4.651	$ 5.055	$ 4.555	$ 3.912	9%	-2%	-16%
Dec-02	$ 4.781	$ 4.366	$ 4.650	$ 3.912	-9%	-3%	-18%
Average					-18%	-5%	-19%

(1) Actual Henry Hub Through April; May is Cash Price on 5/2//01; then Futures Strip

Sources: Natural Gas Week, April 30, 2001; Wall Street Journal On-Line Edition

AFFIDAVIT OF Stan M. Kaplan

COUNTY OF MONTGOMERY)
) ss
STATE OF MARYLAND)

Stan M. Kaplan, being first duly sworn, states that he has participated in the preparation of the accompanying testimony in question and answer form and that the answers he provides are true and correct to the best of his knowledge, information and belief.

Stan M. Kaplan

Subscribed and sworn to before me this 1st day of May, 2001

Notary public

My Commission Expires Feb. 1, 2004

(Notary Seal)