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STEVE CRISAFULLI
Speaker of the House of Representatives

September 23, 2016

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket No. 160001-EI

Dear Ms. Stauffer,

Please find enclosed for filing in the above referenced docket the Direct Testimony and Exhibits of **Daniel J. Lawton**. This filing is being made via the Florida Public Service Commission's Web Based Electronic Filing portal.

If you have any questions or concerns; please do not hesitate to contact me. Thank you for your assistance in this matter.

Sincerely,

Erik L. Sayler
Associate Public Counsel

ELS:bsr
cc: All Parties of Record

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Fuel and Purchased Power Cost Recovery Clause with Generating Performance Incentive Factor	§ § § § § § § § § § §	**Docket No. 160001-EI**

DIRECT TESTIMONY AND EXHIBITS

OF

DANIEL J. LAWTON

ON BEHALF OF THE OFFICE OF PUBLIC COUNSEL

SEPTEMBER 23, 2016

TABLE OF CONTENTS

Exhibits

DIRECT TESTIMONY

OF

DANIEL J. LAWTON

On Behalf of the Office of Public Counsel

Before the

Florida Public Service Commission

Docket No. 160001-EI

SECTION I: INTRODUCTION / BACKGROUND / SUMMARY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Daniel J. Lawton. My business address is 12600 Hill Country Blvd, Suite R-275, Austin, Texas 78738.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I have been working in the utility consulting business as an economist since 1983. Consulting engagements have included electric utility load and revenue forecasting, cost of capital analyses, financial analyses, revenue requirements, fuel reviews, and cost of service reviews, and rate design analyses in litigated rate proceedings before federal, state and local regulatory authorities, and in court proceedings. I have worked with numerous municipal utilities developing electric rate cost of service studies for reviewing and setting rates, including fuel clause rates and reconciliations. In addition, I have a law practice based in Austin, Texas. My main areas of legal practice include administrative law representing municipalities in electric and gas rate proceedings and other litigation and contract matters. I have included a brief description of my relevant educational background and professional work experience in my Exhibit ____ (DJL-1).

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN UTILITY RATE PROCEEDINGS?

A. Yes. I have previously filed testimony in Florida and a number of jurisdictions across the country. A list of cases where I have previously filed testimony is included in my Exhibit ____ (DJL-1).

Q. ON WHOSE BEHALF ARE YOU FILING TESTIMONY IN THIS PROCEEDING?

A. I am providing analyses and testimony related to fuel hedging on behalf of the Office of Public Counsel, State of Florida ("OPC"). I will review the Florida Power & Light Company ("FPL"), Tampa Electric Company ("TECO"), Duke Energy Florida ("DEF), and Gulf Power Company ("Gulf") collectively ("the Companies") annual fuel cost recovery filings related to fuel cost hedging.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony in this proceeding is to update hedging impacts on customers and update gas market information as such information relates to hedging needs, since my testimony in the last fuel case, Docket No. 150001-EI. In addition, I address how gas-dependent utilities establish fuel factors without hedging. I update the impacts of the Companies' hedging programs on consumers and the potential impacts on consumers, assuming the 2017 Risk Management Plans are approved by the Florida Public Service Commission ("Commission"). Another OPC witness, Tarik Noriega, will quantify the updated historical impacts of hedging on consumers.

Q. WHAT MATERIALS DID YOU REVIEW AND RELY ON FOR THIS TESTIMONY?

A. I have reviewed prior rate orders of the Commission, the Companies' various filings in Docket No. 160001-EI, the Companies' filings in prior dockets, discovery responses to requests in this proceeding, along with other information available in the public domain. When relying on various sources, I have referenced such sources in my testimony and/or attached Exhibits and included copies or summaries in my attached Exhibits and/or work papers.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE REASONABLENESS OF CONTINUED FINANCIAL HEDGING.

A. My analysis leads me to conclude that the overall costs of the natural gas financial hedging programs continue to exceed the benefits to consumers. Since the last fuel case, Docket No. 150001-EI, gas market supply and demand have remained stable and natural gas prices have remained low and steady. Hedging costs to consumers continue to mount, now exceeding $6.5 billion since 2002, while hedging benefits (reduced volatility) appear small at best. The hedging programs in Florida continue to provide benefits for Florida utility shareholders in terms of reduced liquidity risk, all at the expense of consumer fuel cost increases. As discussed in my testimony in Docket No. 150001-EI, utility companies around the country continue to reduce financial hedging in light of the changes in the natural gas markets. There are alternatives available to establish the fuel factor which recognize gas market price changes without the added risk of enormous and continued hedging losses. Therefore, I respectfully recommend that, on a prospective basis, the Commission consider ending natural gas hedging activities as a mechanism to limit gas (fuel) price volatility, and that the Commission deny the 2017 Risk Management Plans proposed by the Companies regarding future financial hedging proposals. In summary:

1. There is significant doubt as to the benefits of fuel hedging given the continued low prices and stable production and demand forces in natural gas markets, versus the historical, ongoing, and potential future financial hedging costs to consumers;

2. Natural gas markets in terms of gas production and market supply have changed substantially in recent years, reducing the probability and extent of significant supply-side market disruptions and also reducing natural gas price volatility relative to past years;

3. Regulatory authorities are recognizing the limitations of financial hedging in the changed natural gas markets; and

4. The current fuel factor design and mid-course correction mechanism in Florida already mitigates fuel cost volatility without the need and cost risk of financial hedging.

Q. PLEASE PROVIDE A BRIEF SUMMARY OF YOUR CONCLUSIONS.

A. Since the time financial hedging was first implemented in Florida to address fuel and natural gas price volatility, annual gas production has grown dramatically and available gas reserves are well beyond forecasted levels from even ten years ago. As a result, price levels have declined substantially and price volatility is substantially reduced from past levels. Since September 2015 when I filed testimony in the last year's docket, the average monthly natural gas prices are lower than prior years and have remained stable. Yet, over that same period, the Companies have continued to generate substantial hedging losses, which are passed on to consumers in the form of higher fuel costs.

Moreover, current forecasts of gas market prices indicate stable gas prices in the near-term, mid-term, and longer-term time horizon. Current market forecasts for natural gas all indicate that natural gas prices and markets are more stable, and the facts and circumstances that once supported natural gas hedging as a tool to limit price volatility affecting customers are no longer present. Further, there are available, transparent, cost-free opportunities to limit price volatility impacts while factoring in future expectations in the gas market prices through the fuel adjustment clause without financial hedging. Given the enormous lost-opportunity costs experienced by consumers in terms of overall fuel costs, and the potential for additional lost opportunities for lower gas costs under the past hedging and risk management plans, financial hedging of natural gas should be ended at this time.

For all the above reasons, I recommend that the Commission deny the 2017 Risk Management Plans submitted by the Florida Companies as it relates to the hedging of natural gas.

SECTION II: <u>SUMMARY OF ISSUES ADDRESSED</u>

Q. WHAT ISSUES DO YOU ADDRESS WITH REGARD TO THE FLORIDA COMPANIES' PROPOSALS TO CONTINUE HEDGING NATURAL GAS PURCHASES THROUGH THE PROPOSED 2017 RISK MANAGEMENT PLANS?

A. As a starting point, I first provide a brief summary of my findings and analyses of the hedging issue from Docket No. 150001-EI. Second, I address the changes that have occurred since the last fuel proceeding. These changes entail a review of historical natural gas prices since the last proceeding, and the hedging impact on consumers' fuel prices since the last fuel docket. The third area I analyze is the current forecast of gas markets and current expectations of future gas prices and volatility. The fourth section of my analysis is an update of my 2015 analysis given current market data and forecasts. Lastly, I address alternatives that eliminate hedging costs and provide protection from gas price volatility.

SECTION III: <u>DOCKET NO. 150001-EI HEDGING ANALYSIS</u>

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS RELATED TO FINANCIAL HEDGING IN DOCKET NO. 150001-EI.

A. The starting point of my analysis in this proceeding is my testimony and exhibits from Docket No. 150001-EI. I have included that testimony in my Exhibit ___ (DJL-2) and incorporate that testimony by reference. As shown in Exhibit ___ (DJL-2), my analyses in Docket No. 150001-EI resulted in the following conclusions and recommendations:

1. There is significant doubt as to the benefits of fuel hedging given the historical, ongoing, and potential financial costs to consumers;

2. From 2009 to 2014, significant hedging losses were experienced in five of the six years; and current estimates by the Companies indicate 2015 to be another year of hedging losses, making it six out of the last seven years with hedging losses;

3. The amount of hedging losses or "costs" passed on to consumers in the form of higher-than-market price fuel costs has been substantial with hedging costs (or higher-than-market fuel costs) amounting to a staggering $2.5 billion between 2011 and the estimated 2015-year;

4. Natural gas markets in terms of gas production and market supply have changed substantially in recent years reducing the probability and extent of significant supply-side market disruption and also reducing natural gas price volatility relative to past years;

5. Regulatory authorities are recognizing the limitations of financial hedging in the changed natural gas markets; and

6. The current fuel factor design and mechanism in Florida already adequately mitigates fuel cost volatility without the need and cost risk of financial hedging. [1]

Q. DID YOU PROVIDE A BRIEF SUMMARY OF YOUR CONCLUSIONS IN DOCKET NO. 150001-EI?

A. Yes, my summary was as follows:

Since the early 2000 time period, when gas markets experienced substantial volatility and price spikes for natural gas due to supply constraints along with adverse weather impacting natural gas demand, market conditions particularly the supply of natural gas have changed substantially. Annual gas production has grown dramatically and available gas reserves are well beyond forecasted levels from even ten years ago. As a result, price levels have declined substantially and price volatility is substantially reduced from past levels. Moreover, current

[1] See Direct Testimony Daniel J. Lawton, Docket No. 150001-EI at Page 4.

> forecasts of gas market prices indicate stable gas prices in the near-term, mid-term, and longer-term time horizon. The recent market experience since 2011 and the current market forecasts for natural gas all indicate that volatility is declining, natural gas prices are more stable, and the facts and circumstances that once supported natural gas hedging as a tool to limit price volatility are no longer present. Further, there are available, transparent, cost-free opportunities to limit price volatility impacts on consumers going forward through the fuel adjustment clause. Given the enormous lost-opportunity costs experienced by consumers in terms of overall fuel costs, and the potential for additional lost opportunities for lower gas costs under the status quo hedging and risk management plans, financial hedging of natural gas should be ended at this time.[2]

Since the last fuel proceeding, all these recommendations and conclusions remain valid. As I discuss in detail below: hedging costs continue at high levels to the detriment of consumers,[3] gas prices remain low and stable, gas market production remains strong and stable, gas market projections (short and long-term) remain steady and strong, and many regulatory authorities continue to employ fuel factor approaches without the risks of financial hedging.

SECTION IV: <u>RECENT AND FUTURE NATURAL GAS PRICES AND MARKET EXPECTATIONS</u>

Q. HAVE YOU REVIEWED NATURAL GAS PRICES SINCE THE LAST FUEL PROCEEDING IN DOCKET NO. 150001-EI?

A. Yes. In the last case, the data in my analysis ended in July 2015. The average monthly gas price at July 2015 was \$2.84/MMBtu.[4] Since July 2015, natural gas prices have generally been below \$2.84 for most months. I have included monthly average gas

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[2] See Direct Testimony Daniel J. Lawton, Docket No. 150001-EI at Page 5.

[3] See Direct Testimony of Tarik Noriega.

[4] See Exhibit ___ (DJL-2).

prices and a graph of the historical prices in my Exhibit ___ (DJL-3). These lower gas prices are consistent with the stable market conditions in both natural gas supply and demand that has existed and continues to be forecast well into the future. Further, these lower gas prices are well within the range of the Energy Information Agency (EIA) forecasts.

The average natural gas price in 2015 was $2.63/MMBtu while the average natural gas price decreased in 2016 to $2.26/MMBtu.[5] Thus, on average, prices in the past 12 months have been lower than the previous 12 months. At this time, September 22, 2016, natural gas spot prices have increased to around $3.00/MMBtu.[6] Yet, the Companies continue to hedge and are losing substantial dollars to the detriment of consumers. Natural gas price volatility was not a problem last year or in recent prior years.

Q. WHAT DO THE CURRENT GAS MARKET FORECASTS INDICATE REGARDING FUTURE NATURAL GAS PRICES, AND MARKET SUPPLY AND DEMAND?

A. Based on the September 7, 2016 EIA Short-Term Energy Outlook, current natural gas inventories are in excess of 3,400 billion cubic feet (Bcf), which is higher than last year and the most recent five-year average levels of gas inventories.[7] One key reason for

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[5] The average monthly price for 2016 for January through August 2016 is $2.26/MMBtu, using the Henry Hub Natural Gas Spot Price (Dollars per Million Btu), data available at https://www.eia.gov/dnav/ng/hist/rngwhhdM.htm, last checked September 22, 2016.

[6] https://finance.yahoo.com/quote/ng=f, last checked September 22, 2016.

[7] U.S. Energy Information Administration, Short-Term Energy Outlook (EIA STEO), September 7, 2016 at 1, available at http://www.eia.gov/forecasts/steo/.

such high inventory levels is the warmer than normal weather last winter which left inventories at record-high levels.[8]

Natural gas demand is projected to be 77.1 Bcf/d in 2017. This compares to natural gas demand of 75.2 Bcf/d in 2015 and 76.4 Bcf/d in 2016.[9] Such natural gas demand growth is consistent with the relative growth in Gross Domestic Product (GDP). On the supply or production side of the gas markets, June 2016 marketed production averaged 77.5 Bcf/d. EIA projects that production levels will grow by 3.0% in 2017.[10] In addition, EIA now projects that the U.S. will become a net natural gas exporter by the second quarter of 2017.[11]

As to expectations and estimates of natural gas prices, "EIA expects natural gas prices to gradually rise through the forecast period. Forecast Henry Hub prices average $2.42/MMBtu in 2016 and $2.87/MMBtu in 2017."[12]

Overall, the current EIA Short-Term Outlook predicts slow natural gas market demand growth, more than adequate supply to meet any growth, and continuation of low stable natural gas prices over the short-run forecast, which is a good thing for customers of

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[8] EIA STEO, September 7, 2016 at 6.

[9] EIA STEO, September 7, 2016 at 7.

[10] EIA STEO, September 7, 2016 at 7.

[11] EIA STEO, September 7, 2016 at 7.

[12] EIA STEO, September 7, 2016 at 7.

utilities highly dependent on natural gas for generating electricity. It would be even better if those Companies did not attempt to financially hedge natural gas.

Q. HAVE YOU REVIEWED EIA'S CURRENT LONG-TERM NATURAL GAS MARKET FORECAST?

A. Yes. The long-term forecast through 2040 shows a stable supply and demand in natural gas markets. The projection of real price changes indicate a 2.5% growth in prices for natural gas over the long-term horizon. One of the key takeaways from the 2016 long-term forecast is that "[n]atural gas production increases despite relatively low and stable gas prices."[13] The bottom line is that the U.S. is expected to be a net exporter of natural gas. The amount of exports will be influenced by foreign prices for natural gas. Domestic production is also expected to increase with domestic prices remaining low and stable. Price volatility is not expected to be an issue, meaning financial hedging will provide less benefits, if any benefit at all, based on current forecasts.

Q. DURING THE RECENT PERIOD OF LOW, STEADY GAS PRICES AND MARKET CONDITIONS, HAVE THE FLORIDA UTILITY FINANCIAL HEDGING PROGRAMS CONTINUED LOSING MONEY?

A. Yes. Based on information provided by OPC witness Noriega who addresses this issue, the cumulative financial hedging loss in 2015 was over $820 million. The actual 2016 financial hedging losses through July 31, 2016 are approximately $361 million and projections indicate another $82.9 million of financial hedging losses for the remainder

[13] See U.S. EIA Annual Energy Outlook, Key takeaways from AEO 2016 at 2, available at www.eia.gov/pressroom/presentations/sieminski_06282016.pdf.

of 2016.[14] These levels of financial hedging losses when added to prior financial hedging losses amount to approximately $6.557 billion for the Florida utility hedging activities since 2002.[15] This is not good, especially in light of projections for less volatility and steady gas prices. While one might expect small hedging losses analogous to an insurance premium given financial hedging programs are in place to insure against price volatility, $6.6 billion in losses is well beyond any insurance premium. Moreover, the mounting losses may only get worse.

Q. WHAT ABOUT THE PROJECTED 2017 HEDGING GAINS FOR FPL AND TECO – SHOULDN'T THE COMMISSION GIVE NATURAL GAS HEDGING A FEW MORE YEARS TO ALLOW COMPANIES TO RECOUP SOME OF THEIR LOSSES?

A. No. The gains are based on the most current forecasts the Companies utilize. Right now, the forecasts may show gains for FPL and TECO. But if gas prices continue to stay at or near current levels, this may affect the size of FPL and TECO's currently projected gains.

SECTION V: <u>FINANCIAL HEDGING AND VOLATILITY</u>

Q. IN YOUR OPINION, IS FINANCIAL HEDGING NECESSARY TO LIMIT VOLATILITY?

A. No. I addressed the issue of volatility in natural gas prices last year and this analysis can be found in my Exhibit ___ (DJL-2). Given the current long-term EIA projections

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[14] See Exhibit ___ (DJL-4).
[15] See Exhibit ___ (DJL-4).

of low and steady natural gas market supply and demand balance and steady natural gas market prices, volatility is no longer the concern it once was when Florida utilities started hedging natural gas. Thus, the markets (supply and demand balances) are addressing gas price volatility making financial hedging less valuable. Moreover, so long as the volatility in the price of natural gas does not exceed the 10% threshold for triggering a mid-course correction to the fuel factor, customers will not experience any of the volatility inherent in the natural gas markets.

Q. DO UTILITY SHAREHOLDERS BENEFIT FROM FINANCIAL HEDGING PROGRAMS?

A. Yes. When financial hedging is employed, shareholder liquidity risks are reduced. By locking in natural gas prices through financial hedging and using those locked-in prices in setting the fuel factor, fuel costs on the financially hedged gas purchases are recovered in a timely manner. The non-hedged purchases may or may not be recovered on a current basis. For example, assume gas prices are higher than originally projected in the development of the fuel factor. This will result in a fuel cost under-recovery. While the utility will eventually recover the costs (absent a disallowance for extraordinary reasons), such cost recovery may take a year or more. Given that fuel purchases must be paid for currently, the mismatch between gas purchase and gas cost recovery on unhedged gas purchases can cause cash recovery timing or liquidity issues. Liquidity risks are risks that impact shareholder return risks and these risks are reduced when fuel costs are hedged. That is why the Companies have an incentive to continue hedging, even when it makes no financial sense to do so from the customers' perspective.

The liquidity risk issue, in the context of hedging, was addressed recently by FPL witness Dewhurst in a recent deposition related to FPL's base rate case, Docket No. 160021-EI.[16] The bottom line is that shareholders benefit from fuel hedging in terms of liquidity risk reductions which has cost customers over $6.5 billion since 2002.

Q. DO THE CUSTOMERS RECEIVE SOME BENEFIT FROM FUEL HEDGING?

A. The design of most hedging programs are to benefit customers by insulating them from large changes in fuel prices which can impact customer bills. While fuel hedging is not designed to lower prices or beat the market, because beating the market is not possible in the long-term, hedging can stabilize prices to avoid the immediate impacts of large price spikes. Examples of large natural gas price spikes can be found between 2000 and 2008 in the U.S. gas markets.

The issue now is whether continued financial hedging is beneficial to customers in light of changed natural gas markets, stable gas price forecasts, and mounting hedging losses. The answer to that question is no – financial hedging is not currently beneficial to customers. For example, last year, in Docket No. 150001-EI, FPL attempted to show hedging benefits to customers in the rebuttal testimony of witness Yupp, by asserting fewer mid-course fuel cost corrections are required when fuel hedging is employed.[17] I have included Mr. Yupp's analysis in my Exhibit ___ (DJL-6). What his analysis shows is that most of the mid-course corrections would have resulted in customer

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[16] See Deposition of Moray Dewhurst in Docket No. 160021-EI (August 4, 2016) at pages 16-18. See Exhibit ___(DJL-5).

[17] See Docket No. 150001-EI Rebuttal testimony FPL witness Yupp at Exhibit GJY-7.

refunds. Customer fuel cost refunds, even when requiring a mid-course correction, are not a volatility problem. Moreover, since 2010 when gas markets substantially changed due to increased shale development, only in 2014 would a mid-course correction have been required for a fuel price increase. Given that FPL's hedging costs since 2010 exceed $2.1 billion,[18] it appears that the hedging costs greatly exceeded the hedging benefits. Similarly, the customers of the other Companies may have enjoyed fewer mid-course corrections since 2010 as a result of hedging, but at what cost? The answer is approximately $1.76 billion to potentially avoid relatively few mid-course corrections.

Q. ARE THERE OTHER EXAMPLES OF HEDGING COSTS EXCEEDING CUSTOMER BENEFITS?

A. Yes. One example can be found in the Tampa Electric Company ("TECO") response to OPC's Third Set of Interrogatories No. 20, where TECO attempts to demonstrate volatility mitigating hedging benefits to customers. I have included part of that response showing 2015 actual gas prices versus TECO's hedged gas purchases in the following table:

MONTH	2015 NYMEX GAS PRICES $/MMBtu at HENRY HUB	2015 TECO HEDGED NATURAL GAS PRICES $MMBtu
JANUARY	$3.189	$4.285
FEBRUARY	$2.866	$4.386

[18] See Exhibit ___ (DJL-4).

MARCH	\$2.894	\$4.154
APRIL	\$2.590	\$3.745
MAY	\$2.517	\$3.676
JUNE	\$2.815	\$3.725
JULY	\$2.773	\$3.743
AUGUST	\$2.886	\$3.680
SEPTEMBER	\$2.638	\$3.673
OCTOBER	\$2.563	\$3.646
NOVEMBER	\$2.033	\$3.801
DECEMBER	\$2.206	\$3.861
AVERAGE	\$2.664	\$3.865
STANDARD DEVIATION	\$.303	\$.248

The above table demonstrates that the 2015 actual prices were lower than the TECO hedged purchases in each month of 2015. The average Henry Hub gas price in 2015 was \$2.664/MMBtu while TECO's hedged gas price in 2015 was \$3.865/MMBtu. But, TECO asserts that the variability in gas prices were reduced through the hedging plan as evidenced through the lower standard deviation for the hedged prices. While TECO's statement concerning the standard deviation metric is correct, TECO never mentions the cost of the hedging activities. The 2015 TECO hedging cost to consumers is about $39.8 million (See Exhibit ___ (DJL-4). These costs substantially exceeded the hedging benefits in 2015 for TECO's customers. Again, in a period of stable gas markets and low prices, financial hedging of natural gas has become a burden on consumers.

SECTION VI: FINANCIAL HEDGING ALTERNATIVES

Q. HOW DO UTILITY COMPANIES SET FUEL FACTORS WHEN FINANCIAL HEDGING IS NOT EMPLOYED?

A. One example is Entergy Texas, Inc. ("ETI"), a vertically integrated utility in Texas with a high level of gas generation and no financial hedging. ETI calculates the fixed fuel factor twice a year in March and September. The fuel factor process is set up as a simplified, transparent proceeding. The overall process of setting the semi-annual fuel factor is accomplished in nine simple steps as follows:

1. Total actual fuel costs for the prior 12 months is calculated.

2. Coal and Nuclear Fuel costs are subtracted from the Line 1 Total.

3. The result is the fuel factor expense without coal and nuclear.

4. A projected Market Factor is calculated based on the percent change in the market cost of gas.

4a. The Market Factor is calculated employing the following formula:

(Simple Average of the Henry Hub Natural Gas Prices For The Next 12 Months) / (Actual Henry Hub Prices For The Most Recent 12 Months)

The Market Factor employs the Annual average monthly NYMEX Henry Hub settlement prices from the Wall Street Journal for the next 12 months. This annual average is calculated for each of the first 10 business days of the month preceding the fuel factor change. This calculation takes into account current and future natural gas market conditions and prices. As stated earlier, the denominator of the Market Factor calculation reflects the average of the recent actual Henry Hub prices. The resulting ratio or Market Factor is then used to adjust gas costs up or down depending on Market Factor results. **Thus, current and expected natural gas market conditions are reflected in the fuel factor without the need for financial hedging.**

5. Step 5 multiplies the Market Factor calculated in Step 4 times the gas costs calculated in Step 3.
6. The non-gas costs calculated in Step 2 are now added back into the Market Factor adjusted gas costs calculated in Step 5.
7. The result of the sum of Step 6 and 5 is the total fuel factor expense to be collected.
8. Actual billing determinants are calculated.
9. The ratio of Step 7 to Step 8 is the resulting unit fuel factor.

I have included a three-page summary of ETI's most recent fuel factor calculation in Exhibit ___ (DJL-7).

Q. COULD A SIMILAR FUEL FACTOR APPROACH BE EMPLOYED FOR THE FLORIDA UTILITY COMPANIES?

A. Yes. While adjustments may be required for annual versus semi-annual recognition of other cost items included in the Florida fuel factor, such a model could be developed to recognize market changes in gas costs without the need for financial hedging.

Q. HOW DOES THE ETI FUEL FACTOR COMPARE TO THAT OF THE FLORIDA COMPANIES' FUEL FACTOR?

A. The current ETI fuel factor is $.034798 per Kwh before line loss adjustments. The most recent fuel factor decision for Florida Companies in 2016 is as follows:[19]

1. FPL $.02837/Kwh (June – December 2016);
2. Duke $.03677/Kwh;
3. Gulf $.03650/Kwh; and
4. TECO $.03671/Kwh.

[19] Order No. PSC-15-0586-FOF-EI, issued December 23, 2015, in Docket No. 150001-EI.

The ETI fuel factor calculation without hedging is within the range of the factors calculated for the Florida fuel factors with hedging. The major difference is that ETI customers have no risk of suffering hedging losses, while history shows Florida customers have a high probability of continued and mounting hedging losses if hedging is allowed to continue unabated.

Q. ARE YOU RECOMMENDING THAT THE COMMISSION ADOPT AN ALTERNATIVE FUEL MECHANISM?

A. No. I am recommending that the Commission deny approval of the Companies' 2017 Risk Management Plans, and order the Companies to discontinue the financial hedging of natural gas. I present the alternative fuel mechanism to demonstrate that financial hedging is not necessary, even for utility companies that are highly dependent on natural gas.

Q. IN YOUR OPINION, HAS THE NATURAL GAS MARKET'S CONTINUED STEADY AND STABLE PERFORMANCE AND THE EIA FORECASTS FOR CONTINUED LOW AND STABLE NATURAL GAS PRICES CREATED A REASONABLE BASIS TO RECONSIDER FINANCIAL HEDGING?

A. Yes. As outlined in my testimony in Docket No. 150001-EI, and as I discuss above, the natural gas markets have changed substantially over the past few years. The recent and current EIA forecasts show that natural gas production has substantially increased, forward estimates of natural gas prices have become more stable, and price volatility has declined. As discussed in my testimony in Docket No. 150001-EI, based on these factors, some regulatory authorities and utilities have concluded financial hedging is no longer necessary and, moreover, is no longer worth the risks or costs associated with financial hedging. For all of the above reasons, I recommend that the Companies' proposed financial hedging plans not be approved on a going-forward basis. If circumstances change substantially, hedging can be visited again in the future.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and foregoing Direct Testimony and Exhibits of Daniel J. Lawton has been furnished by electronic mail on this 23rd day of September, 2016, to the following:

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Prior to beginning his own consulting practice Diversified Utility Consultants, Inc., in 1986 where he practiced as a firm principal through December 31, 2005, Mr. Lawton had been in the utility consulting business with a national engineering and consulting firm. In addition, Mr. Lawton has been employed as a senior analyst and statistical analyst with the Department of Public Service in Minnesota. Prior to Mr. Lawton's involvement in utility regulation and consulting he taught economics, econometrics, statistics and computer science at Doane College.

Mr. Lawton has conducted numerous revenue requirements, fuel reconciliation reviews, financial, and cost of capital studies on electric, gas and telephone utilities for various interveners before local, state and federal regulatory bodies. In addition, Mr. Lawton has provided studies, analyses, and expert testimony on statistics, econometrics, accounting, forecasting, and cost of service issues. Other projects in which Mr. Lawton has been involved include rate design and analyses, prudence analyses, fuel cost reviews and regulatory policy issues for electric, gas and telephone utilities. Mr. Lawton has developed software systems, databases and management systems for cost of service analyses.

Mr. Lawton has developed numerous forecasts of energy and demand used for utility generation expansion studies as well as municipal financing. Mr. Lawton has represented numerous municipalities as a negotiator in utility-related matters. Such negotiations range from the settlement of electric rate cases to the negotiation of provisions in purchase power contracts.

In addition to rate consulting work, Mr. Lawton through the Lawton Law Firm represents numerous municipalities in Texas before regulatory authorities in electric and gas proceedings. Mr. Lawton also represents municipalities in various contract and franchise matters involving gas and electric utility matters.

A list of cases in which Mr. Lawton has provided testimony is attached.

UTILITY RATE PROCEEDINGS IN WHICH TESTIMONY HAS BEEN PRESENTED BY DANIEL J. LAWTON

PUBLIC UTILITIES COMMISSION OF CALIFORNIA		
Southern California Edison	12-0415	Cost of Capital
ALASKA REGULATORY COMMISSION		
Beluga Pipe Line Company Municipal Light & Power Enstar Natural Gas Co.	P-04-81 U-13-184 U-14-111	Cost of Capital Cost of Capital Cost of Capital
San Diego Gas and Electric	12-0416	Cost of Capital
Southern California Gas	12-0417	Cost of Capital
Pacific Gas and Electric	12-0418	Cost of Capital

GEORGIA PUBLIC SERVICE COMMISSION		
Georgia Power Co.	25060-U	Cost of Capital

FEDERAL ENERGY REGULATORY COMMISSION		
Alabama Power Company	ER83-369-000	Cost of Capital
Arizona Public Service Company	ER84-450-000	Cost of Capital
Florida Power & Light	EL83-24-000	Cost Allocation, Rate Design
Florida Power & Light	ER84-379-000	Cost of Capital, Rate Design, Cost of Service
Southern California Edison	ER82-427-000	Forecasting

LOUISIANA PUBLIC SERVICE COMMISSION		
Louisiana Power & Light	U-15684	Cost of Capital, Depreciation

Louisiana Power & Light	U-16518	Interim Rate Relief
Louisiana Power & Light	U-16945	Nuclear Prudence, Cost of Service

MARYLAND PUBLIC SERVICE COMMISSION		
Baltimore Gas and Electric Company	9173	Financial
Baltimore Gas and Electric Company	9326	Financial

MINNESOTA PUBLIC UTILITIES COMMISSION		
Continental Telephone	P407/GR-81-700	Cost of Capital
Interstate Power Co.	E001/GR-81-345	Financial
Montana Dakota Utilities	G009/GR-81-448	Financial, Cost of Capital
New ULM Telephone Company	P419/GR81767	Financial
Norman County Telephone	P420/GR-81-230	Rate Design, Cost of Capital
Northern States Power	G002/GR80556	Statistical Forecasting, Cost of Capital
Northwestern Bell	P421/GR80911	Rate Design, Forecasting

MISSOURI PUBLIC SERVICE COMMISSION		
Missouri Gas Energy	GR-2009-0355	Financial
Ameren UE	ER-2010-0036	Financial

FLORIDA PUBLIC SERVICE COMMISSION		
Progress Energy	070052-EI	Cost Recovery
Florida Power and Light	080677-EI	Financial
Florida Power and Light	090130-EI	Depreciation

Progress Energy	090079-EI	Depreciation
Florida Power and Light	120015-EI	Financial Metrics
Florida Power and Light	140001-EI	Economic and Regulatory Policy Issues
Florida Power and Light	150001-EI	Economic and Regulatory Policy Issues Financial Gas Hedging
Florida Power and Light	160021-EI	Return on Equity Incentives & Financial Integrity

NORTH CAROLINA UTILITIES COMMISSION		
North Carolina Natural Gas	G-21, Sub 235	Forecasting, Cost of Capital, Cost of Service

OKLAHOMA PUBLIC SERVICE COMMISSION		
Arkansas Oklahoma Gas Corporation	200300088	Cost of Capital
Public Service Company of Oklahoma	200600285	Cost of Capital
Public Service Company of Oklahoma	200800144	Cost of Capital
Public Service Company of Oklahoma	201200054	Financial and Earnings Related
Oklahoma Natural Gas	201500213	Return on Equity, Financial, capital Structure

PUBLIC SERVICE COMMISSION OF INDIANA		
Kokomo Gas & Fuel Company	38096	Cost of Capital

PUBLIC UTILITY COMMISSION OF NEVADA		
Nevada Bell	99-9017	Cost of Capital
Nevada Power Company	99-4005	Cost of Capital
Sierra Pacific Power Company	99-4002	Cost of Capital
Nevada Power Company	08-12002	Cost of Capital
Southwest Gas Corporation	09-04003	Cost of Capital
Sierra Pacific Power Company	10-06001 & 10-06002	Cost of Capital & Financial
Nevada Power Co. and Sierra Pacific Power Co.	11-06006 11-06007 11-06008	Cost of Capital
Southwest Gas Corp.	12-04005	Cost of Capital
Sierra Power Company	13-06002 13-06003 13-06003	Cost of Capital
NV Energy & MidAmerican Energy Holdings Co.	13-07021	Merger and Public Interest Financial
Sierra Power Company	16-06006 16-06007	Cost of Capital

PUBLIC SERVICE COMMISSION OF UTAH		
PacifiCorp	04-035-42	Cost of Capital
Rocky Mountain Power	08-035-38	Cost of Capital
Rocky Mountain Power	09-035-23	Cost of Capital
Rocky Mountain Power	10-035-124	Cost of Capital

Rocky Mountain Power	11-035-200	Cost of Capital
Questar Gas Company Rocky Mountain Power	13-057-05 13-035-184	Cost of Capital Cost of Capital

SOUTH CAROLINA PUBLIC SERVICE COMMISSION		
Piedmont Municipal Power	82-352-E	Forecasting

PUBLIC UTILITY COMMISSION OF TEXAS		
Central Power & Light Company	6375	Cost of Capital, Financial Integrity
Central Power & Light Company	9561	Cost of Capital, Revenue Requirements
Central Power & Light Company	7560	Deferred Accounting
Central Power & Light Company	8646	Rate Design, Excess Capacity
Central Power & Light Company	12820	STP Adj. Cost of Capital, Post Test-year adjustments, Rate Case Expenses
Central Power & Light Company	14965	Salary & Wage Exp., Self-Ins. Reserve, Plant Held for Future use, Post Test Year Adjustments, Demand Side Management, Rate Case Exp.
Central Power & Light Company	21528	Securitization of Regulatory Assets
El Paso Electric Company	9945	Cost of Capital, Revenue Requirements, Decommissioning Funding
El Paso Electric Company	12700	Cost of Capital, Rate Moderation Plan, CWIP, Rate Case Expenses
Entergy Gulf States Incorporated	16705	Cost of Service, Rate Base, Revenues, Cost of Capital, Quality of Service
Entergy Gulf States Incorporated	21111	Cost Allocation
Entergy Gulf States Incorporated	21984	Unbundling

Entergy Gulf States Incorporated	22344	Capital Structure
Entergy Gulf States Incorporated	22356	Unbundling
Entergy Gulf States Incorporated	24336	Price to Beat
Gulf States Utilities Company	5560	Cost of Service
Gulf States Utilities Company	6525	Cost of Capital, Financial Integrity
Gulf States Utilities Company	6755/7195	Cost of Service, Cost of Capital, Excess Capacity
Gulf States Utilities Company	8702	Deferred Accounting, Cost of Capital, Cost of Service
Gulf States Utilities Company	10894	Affiliate Transaction
Gulf States Utilities Company	11793	Section 63, Affiliate Transaction
Gulf States Utilities Company	12852	Deferred acctng., self-Ins. reserve, contra AFUDC adj., River Bend Plant specifically assignable to Louisiana, River Bend Decomm., Cost of Capital, Financial Integrity, Cost of Service, Rate Case Expenses
GTE Southwest, Inc.	15332	Rate Case Expenses
Houston Lighting & Power	6765	Forecasting
Houston Lighting & Power	18465	Stranded costs
Lower Colorado River Authority	8400	Debt Service Coverage, Rate Design
Southwestern Electric Power Company	5301	Cost of Service
Southwestern Electric Power Company	4628	Rate Design, Financial Forecasting
Southwestern Electric Power Company	24449	Price to Beat Fuel Factor
Southwestern Bell Telephone Company	8585	Yellow Pages
Southwestern Bell Telephone Company	18509	Rate Group Re-Classification
Southwestern Public Service	13456	Interruptible Rates

Company		
Southwestern Public Service Company	11520	Cost of Capital
Southwestern Public Service Company	14174	Fuel Reconciliation
Southwestern Public Service Company	14499	TUCO Acquisition
Southwestern Public Service Company	19512	Fuel Reconciliation
Texas-New Mexico Power Company	9491	Cost of Capital, Revenue Requirements, Prudence
Texas-New Mexico Power Company	10200	Prudence
Texas-New Mexico Power Company	17751	Rate Case Expenses
Texas-New Mexico Power Company	21112	Acquisition risks/merger benefits
Texas Utilities Electric Company	9300	Cost of Service, Cost of Capital
Texas Utilities Electric Company	11735	Revenue Requirements
TXU Electric Company	21527	Securitization of Regulatory Assets
West Texas Utilities Company	7510	Cost of Capital, Cost of Service
West Texas Utilities Company	13369	Rate Design

RAILROAD COMMISSION OF TEXAS		
Energas Company	5793	Cost of Capital
Energas Company	8205	Cost of Capital
Energas Company	9002-9135	Cost of Capital, Revenues, Allocation
Lone Star Gas Company	8664	Rate Design, Cost of Capital, Accumulated Depr. & DFIT, Rate Case Exp.
Lone Star Gas Company-Transmission	8935	Implementation of Billing Cycle Adjustment
Southern Union Gas Company	6968	Rate Relief
Southern Union Gas Company	8878	Test Year Revenues, Joint and Common

		Costs
Texas Gas Service Company	9465	Cost of Capital, Cost of Service, Allocation
TXU Lone Star Pipeline	8976	Cost of Capital, Capital Structure
TXU-Gas Distribution	9145-9151	Cost of Capital, Transport Fee, Cost Allocation, Adjustment Clause
TXU-Gas Distribution	9400	Cost of Service, Allocation, Rate Base, Cost of Capital, Rate Design
Westar Transmission Company	4892/5168	Cost of Capital, Cost of Service
Westar Transmission Company	5787	Cost of Capital, Revenue Requirement
Atmos	10000	Cost of Capital
Texas Gas Service Company	10506	Cost of Capital

TEXAS WATER COMMISSION		
Southern Utilities Company	7371-R	Cost of Capital, Cost of Service

SCOTSBLUFF, NEBRASKA CITY COUNCIL		
K. N. Energy, Inc.		Cost of Capital

HOUSTON CITY COUNCIL		
Houston Lighting & Power Company		Forecasting

PUBLIC UTILITY REGULATION BOARD OF EL PASO, TEXAS		
Southern Union Gas Company		Cost of Capital

DISTRICT COURT CAMERON COUNTY, TEXAS		
City of San Benito, et. al. vs. PGE Gas Transmission et. al.	96-12-7404	Fairness Hearing

DISTRICT COURT **HARRIS COUNTY, TEXAS**		
City of Wharton, et al vs. Houston Lighting & Power	96-016613	Franchise fees

DISTRICT COURT **TRAVIS COUNTY, TEXAS**		
City of Round Rock, et al vs. Railroad Commission of Texas et al	GV 304,700	Mandamus

SOUTH DAYTONA, FLORIDA		
City of South Daytona v. Florida Power and Light	2008-30441-CICI	Stranded Costs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Fuel and purchased power cost recovery clause with generating performance incentive factor	§ § § § § § § § § § §	**Docket No. 150001-EI**

DIRECT TESTIMONY AND EXHIBITS

OF

DANIEL J. LAWTON

ON BEHALF OF THE OFFICE OF PUBLIC COUNSEL

SEPTEMBER 23, 2015

TABLE OF CONTENTS

Exhibits

DIRECT TESTIMONY
OF
DANIEL J. LAWTON

On Behalf of the Office of Public Counsel

Before the

Florida Public Service Commission

Docket No. 150001-EI

SECTION I: INTRODUCTION/BACKGROUND/SUMMARY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Daniel J. Lawton. My business address is 12600 Hill Country Blvd, Suite R-275, Austin, Texas 78738.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I have been working in the utility consulting business as an economist since 1983. Consulting engagements have included electric utility load and revenue forecasting, cost of capital analyses, financial analyses, revenue requirements, fuel reviews, and cost of service reviews, and rate design analyses in litigated rate proceedings before federal, state and local regulatory authorities, and in court proceedings. I have worked with numerous municipal utilities developing electric rate cost of service studies for reviewing and setting rates, including fuel clause rates and reconciliations. In addition, I have a law practice based in Austin, Texas. My main areas of legal practice include administrative law representing municipalities in electric and gas rate proceedings and other litigation and contract matters. I have included a brief description of my relevant educational background and professional work experience in my Exhibit ____ Schedule (DJL-1).

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN UTILITY RATE PROCEEDINGS?

A. Yes. I have previously filed testimony in Florida and a number of jurisdictions across the country. A list of cases where I have previously filed testimony is included in my Exhibit ____ Schedule (DJL-1).

Q. ON WHOSE BEHALF ARE YOU FILING TESTIMONY IN THIS PROCEEDING?

A. I am providing analyses and testimony related to fuel hedging on behalf of the Office of Public Counsel, State of Florida ("OPC"). I will review the Florida Power & Light Company ("FPL"), Tampa Electric Company ("TECO"), Duke Energy Florida ("DEF), and Gulf Power Company's ("Gulf"), collectively ("the Companies") annual fuel cost recovery filings related to fuel cost hedging.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony in this proceeding is to address some of the economic and regulatory policy issues surrounding the Companies' proposals to continue their natural gas financial hedging programs as described in their 2016 Risk Management Plans. I address the historical impacts of the Companies' hedging programs on consumers and the potential impacts on consumers if the 2016 Risk Management Plans are approved by the Florida Public Service Commission ("Commission"). Another OPC witness, Tarik Noriega, will quantify the historical impacts of hedging on consumers.

Q. WHAT MATERIALS DID YOU REVIEW AND RELY ON FOR THIS TESTIMONY?

A. I have reviewed prior rate orders of the Commission, the Companies' various filings in Docket No. 150001-EI, the Companies' filings in prior dockets, discovery responses to various requests in this proceeding, along with other information available in the public domain. When relying on various sources, I have referenced such sources in my testimony and/or attached Schedules and included copies or summaries in my attached Schedules and/or work papers.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE REASONABLENESS OF CONTINUED FINANCIAL HEDGING.

A. My analysis leads me to conclude that the overall costs of the natural gas financial hedging programs exceed the benefits to consumers. Therefore, I recommend that, on a prospective basis, the proposed continuation of gas hedging activities should be ended as a mechanism to limit gas (fuel) price volatility, and that the 2016 Risk Management Plans proposed by the Companies regarding future financial hedging proposals should not be approved by the Commission for the following reasons:

1. There is significant doubt as to the benefits of fuel hedging given the historical, ongoing, and potential financial costs to consumers;

2. From 2009 to 2014, significant hedging losses were experienced in five of the six years; and current estimates by the Companies indicate 2015 to be another year of hedging losses, making it six out of the last seven years with hedging losses;

3. The amount of hedging losses or "costs" passed on to consumers in the form of higher-than-market price fuel costs has been substantial with hedging costs (or higher-than-market fuel costs) amounting to a staggering $2.5 billion between 2011 and the estimated 2015 year;

4. Natural gas markets in terms of gas production and market supply have changed substantially in recent years reducing the probability and extent of significant supply-side market disruption and also reducing natural gas price volatility relative to past years;

5. Regulatory authorities are recognizing the limitations of financial hedging in the changed natural gas markets; and

6. The current fuel factor design and mechanism in Florida already adequately mitigates fuel cost volatility without the need and cost risk of financial hedging.

Q. PLEASE PROVIDE A BRIEF SUMMARY OF YOUR CONCLUSIONS.

A. Since the early 2000 time period, when gas markets experienced substantial volatility and price spikes for natural gas due to supply constraints along with adverse weather impacting natural gas demand, market conditions particularly the supply of natural gas have changed substantially. Annual gas production has grown dramatically and available gas reserves are well beyond forecasted levels from even ten years ago. As a result, price levels have declined substantially and price volatility is substantially reduced from past levels. Moreover, current forecasts of gas market prices indicate stable gas prices in the near-term, mid-term, and longer-term time horizon. The recent market experience since 2011 and the current market forecasts for natural gas all indicate that volatility is declining, natural gas prices are more stable, and the facts and circumstances that once supported natural gas hedging as a tool to limit price volatility are no longer present. Further, there are available, transparent, cost-free opportunities to limit price volatility impacts on consumers going forward through the fuel adjustment clause. Given the enormous lost-opportunity costs experienced by consumers in terms of overall fuel costs, and the potential for additional lost opportunities for lower gas costs under the status quo hedging and risk management plans, financial hedging of natural gas should be ended at this time.

For all the above reasons, I recommend the Commission deny the 2016 Risk Management Plans submitted by the Florida Companies and that financial hedging of natural gas should be discontinued.

SECTION II: SUMMARY OF ISSUES ADDRESSED

Q. WHAT ISSUES DO YOU ADDRESS WITH REGARD TO THE FLORIDA COMPANIES' PROPOSALS TO CONTINUE HEDGING NATURAL GAS PURCHASES THROUGH THE VARIOUS RISK MANAGEMENT PLANS?

A. I first provide a brief summary of the historical financial hedging position of the Florida Companies. OPC witness Noriega addresses the history of the fuel adjustment clause and hedging in his testimony, and the amount of historical hedging losses experienced. My analysis of the financial hedging history examines these historical results from a statistical and volatility metric perspective;

Second, I address the natural gas market changes that have impacted natural gas market supply, prices, and market volatility;

Third, I address how the natural gas market results, related to declining gas price volatility in recent years, are tied to market changes making financial hedging in natural gas less effective;

Fourth, I address how regulatory authorities around the country are beginning to recognize that financial hedging of natural gas is not beneficial to consumers; and

Fifth, I address how the existing fuel factor mechanism addresses price volatility issues. I also address previously proposed changes that, if adopted, address fuel price volatility without the unnecessary cost or risks of financial hedging.

These issues and topics are addressed in the following testimony to arrive at a recommendation in this case.

SECTION III: HISTORICAL OVERVIEW OF NATURAL GAS HEDGING

Q. BEFORE GETTING INTO THE HISTORICAL OVERVIEW OF HEDGING, PLEASE DESCRIBE AND DEFINE NATURAL GAS PRICE HEDGING.

A. Natural gas price hedging is an action or economic activity intended to reduce price fluctuations or volatility. Hedging accomplishes the goal of reducing price volatility by locking in the future price to be paid ahead of time rather than subjecting future fuel purchases to the day-to-day price changes in the market place. The simplest form is an action taken to insure against price volatility risk. A natural gas hedge can be a physical or financial hedge. An example of a hedge is the purchase of a future gas quantity at a fixed price. Thus, no matter what the future market price, this pre-purchased gas quantity is hedged or locked-in.

A hedge is analogous to an insurance policy that protects against future price changes and volatility. It is important to note that the hedged or locked-in price assured by the hedge may be higher or lower than the future gas market price at the time the commodity is needed and consumed. In other words, hedges are not designed to beat the future market prices. Instead, hedging programs are designed to lock down prices and avoid the day-to-day volatility in market prices. However, when the sole purpose is to mitigate price volatility, then there is no built-in ability to capture any of the benefits associated with declining fuel prices on the hedged portion of natural gas.

The Commission has previously provided guidance as to a definition of financial hedging as follows:

> Financial hedging is a term used to describe the purchase or sale of an exchange-traded futures or options contract with the specific intent of protecting an existing or anticipated physical market position from unexpected or adverse price fluctuations.[1]

Financial hedging of fuel purchases has been defined and employed in Florida as a tool in the fuel procurement process for a significant period of time.

Q. DO HEDGING PROGRAMS HAVE COSTS?

A. Yes. There are two types of hedging costs. First, there is the cost of running a hedging program in terms of labor of staff dedicated to implementing the hedging program. These hedging program costs are generally not large.

Second, there are opportunity costs associated with hedging. With the purchase and sale of various hedging instruments relative to ultimate market prices, there are opportunity costs (losses) when the market price settles lower than the hedged price, and benefits (savings or gains) when the market price settles higher than the hedged price. By locking in a future price through hedging instruments, consumers lose the benefit of lower market prices when the hedged or locked in price is lower than the market price. These hedged natural gas prices versus market prices are the key

[1] "Notice of Proposed Agency Action Order Finding Florida Power & Light Company Took Reasonable Steps To manage The Risks Associated With Changes In Natural Gas Prices For The Period March 1999 Through March 2001", Order No. PSC-02-0793-PAA-EI, issued June 11, 2002, in Docket No. 011605-EI, In re: Review of Investor-owned electric utilities' risk management policies and procedures, at 3.

opportunity costs associated with hedging that need to be evaluated when assessing the benefits and need of hedging future natural gas purchases.

As used in my testimony, "hedging cost" or "hedging loss" refers to these opportunity costs associated with hedging and not the costs to run or administer a Company's hedging program.

Q. DO THE DAILY NATURAL GAS PRICE CHANGES (PRICE VOLATILITY) DIRECTLY AND IMMEDIATELY IMPACT RATES PAID BY FLORIDA CONSUMERS?

A. No. The day-to-day changes in natural gas prices (price volatility) do not directly and immediately have an impact on the monthly rates consumers pay in their monthly electric bills. This is because of the manner in which the Commission establishes the annual fuel factor in the annual fuel adjustment clause proceeding (A/K/A "Fuel Docket"). The fuel portion of the utility bill is estimated annually based on projected sales of electricity, fuel quantities needed for electric generation, fuel prices, and prior over/under recoveries – all to establish a fuel factor to be applied to the kilowatt consumption of consumer bills. Once established by the Commission, the fuel factor stays in place until changed by the agency at some future date.

Fuel factors are reviewed and changed at least on an annual basis. A more frequent fuel factor review is also possible through what is referred to as a mid-course correction as discussed below.

The fuel factor mechanism in Florida is similar to what many regulatory jurisdictions employ regarding establishing tariffs for future unknown fuel costs, collecting fuel costs, and addressing material changes in fuel costs during the collection period.

While day-to-day changes in market fuel prices (price volatility) do not alter the fuel factor, the cumulative effect of unexpected changes in market prices could have the effect of creating the need for a mid-course correction in the fuel factor because the materiality threshold is met due to the unexpected price changes. In other words, if the current fuel factor is determined to materially over/under collect fuel costs, then the utility is required to notify the Commission. Depending on the circumstances surrounding the material recovery deficiency, a new fuel factor may be established and charged to consumers to address fuel cost recovery.

Thus, while changes in commodity price levels (up or down) certainly will affect future fuel factor calculations, there is no direct and immediate impact of this price fluctuation on consumers' rates while a fuel factor is in place. However, to the extent fuel price volatility creates a material change in fuel costs (generally 10% over/under recovery of fuel costs), then a mid-course correction in fuel charges could be required.

Q. IS THERE A HEDGING COST REASON OR CONSIDERATION FOR THE COMMISSION TO REVISIT HEDGING PROGRAMS?

A. Yes. In 2008, the Commission stated "Hedging program[s] are designed to assist in managing the impacts of fuel price volatility. Within any given calendar period, hedging can result in gains or losses. *Over time, gains and losses are expected to offset* *one another.*"[2] (emphasis added). Since 2008, high levels of losses or lost opportunities, related to lower market prices relative to the hedged payment that have been part of a continuing trend over time, have resulted and should raise a red flag concerning the continuation of the hedging program and the costs borne by customers. Regulatory authorities should expect to see some losses in hedging for some years and possibly most years given ongoing program costs and the fact that financial hedging, like insurance protection, for price stability is not free. However, large and prolonged hedging losses should signal a re-evaluation of hedging programs in order to stem the tide of losses and costs to consumers.

Q. PLEASE PROVIDE AN HISTORICAL OVERVIEW OF NATURAL GAS HEDGING COSTS TO CONSUMERS.

A. Historical hedging costs of the Companies are being addressed in the testimony of OPC witness Tarik Noriega. Also, a review of earlier year historical hedging in Florida has been addressed and described in the Commission Staff's review of "Fuel Procurement Hedging Practices of Florida's Investor-Owned Electric Utilities" at www.floridapsc.com/publications/pdf/electricgas/HedgingPracticesIOUs.pdf (June 2008). Since the Commission Staff's June 2008 analysis, the utility companies in Florida have collectively missed out on substantial lower gas cost opportunities due to fuel hedging activities required by their Risk Management Plans every year for 2009 through 2015, except in 2014. The following table summarizes the Companies' annual

[2] Order No. PSC-08-0030-FOF-EI, at 4, issued January 8, 2008, in Docket No. 070001-EI, In re: Fuel and purchased power cost recovery clause with generating performance incentive factor.

hedging opportunity costs (losses) for 2011 through 2015[3]:

Table-1[4]

Historic Hedging Opportunity Costs to Florida Customers

YEAR	HEDGING OPPORTUNITY LOSSES
2011	($694,455,607)
2012	($1,117,525,079)
2013	($140,565,299)
2014	$106,424,864
2015	($646,050,220)
Total 2011-2015	($2,492,171,341)

The hedging activities of the Florida Companies have cost consumers in terms of higher-than-market fuel costs every year except 2014. More recent hedging activities (since 2011) show substantial and mounting losses associated with fuel-related opportunity costs as a result of financial hedging.

While recent hedged prices may be locked-in and are not as volatile as market prices, the question before the Commission is whether the cost of the price stability - that is,

[3] The 2015 projected loss data is based on the Florida utilities' estimates of hedging losses provided in response to OPC's First Set of Interrogatories to Duke, Gulf, and TECO No. 5; and OPC's Fourth Set of Interrogatories to FPL No. 29.
[4] The Hedging Opportunity Losses are taken from the Responses to OPC's First Set of Interrogatories to Duke No. 2, To Gulf No. 2, To TECO No. 2, and OPC's Fourth Set of Interrogatories to FPL No. 26.

the elimination of price volatility, which cost consumers about $2.5 billion in lost market opportunities and higher gas prices since 2011 - is justified. Given current gas markets and current projections the answer to the question is: No.

Prices in the natural gas markets are declining. Volatility in gas prices is declining. There is just no basis to conclude that consumers should be paying substantially higher-than-market prices for natural gas to limit volatility when market evidence indicates volatility is declining and eliminating the need for hedging. Moreover, what price volatility impacts on consumers remain in today's environment are already mitigated through the Commission's fuel clause mechanism without financial hedging and its associated costs and risk to consumers.

Q. YOU USE THE TERM PRICE VOLATILITY IN CONJUNCTION WITH YOUR DISCUSSION OF HEDGING. WHAT IS PRICE VOLATILITY?

A. Generally speaking, price volatility is a broad and relatively loosely defined term. Price volatility speaks to changes in market prices; however, the impact and degree of volatility on market participants can vary substantially depending upon the geographic market or time interval of prices examined. For example, hourly price changes are different from daily, weekly, monthly, or annually averaged price changes.

Given that price volatility is not a precisely defined term, the measurement of price volatility can be subject to different approaches. For example, price volatility can be measured based on changes in the absolute value of price changes. This measure is what one finds each day in the business reporting of price changes in markets. Absolute energy average price changes showing rapid and/or unanticipated change reflect a volatile market.

Another measure of volatility is viewed in terms of return, or the change in price relative to a previous price. These return measures of volatility measure the percentage change in price rather than the absolute value price increment described above. Thus, a 10 percent change is the same whether measured from a \$0.20 increase from \$2.00 per MMBtu, or a \$1.00 increase from \$10.00 per MMBtu.

Q. DO PRIOR COMMISSION ORDERS HELP IN DEFINING FUEL PRICE VOLATILITY?

A. No. Volatility is only defined generically. For example, in the "Order Approving Resolution of Issues" the Commission's Order No. PSC-02-1484-FOF-EI, in Docket No. 011605-EI, dated October 30, 2002, the proposed resolution of issues states the following:

> Each investor-owned electric utility recognizes the importance of managing price volatility in the fuel and purchase power it purchases to provide electric service to its customers. Further, each investor-owned electric utility recognizes that the greater the proportion of a particular fuel or purchased power it relies upon to provide electric service to its customers, the greater the importance of managing price volatility associated with that energy source.[5]

[5] Order No. PSC-02-1484-FOF-EI, issued October 30, 2002, in Docket No. 011605-EI, <u>In re: Review of investor-owned electric utilities' risk management policies and procedures</u>, at Attachment A "Components of Proposed Resolution, paragraph 1.

Thus, while the Commission points out the importance and potential impact of price volatility on electric consumer rates, no general or specific approaches to identifying and/or measuring price volatility are provided.

Q. DO THE FLORIDA COMPANIES PROVIDE AN APPROACH TO CALCULATING PRICE VOLATILITY?

A. Yes. The following was provided by each of the Florida Companies regarding price volatility:

> FPL: Volatility, as it relates to fuel prices, is a statistical measure of the variation in prices over time. Historical volatility for natural gas is measured by taking the standard deviation of the historical, measured day-to-day percentage deviations of the forward curve.[6]
>
> TECO: Tampa Electric measures variability and/or volatility of fuel costs primarily through standard deviation. Standard deviation is a common, mathematically sound means for assessing the variation in a set of values relative to the mean of that set of values.[7]
>
> DEF: There are two general methods for estimating volatility. One involves calculating the standard deviation of changes in historical prices, and the other derives the implied volatility using market prices of traded options. The Company uses the latter approach which provides the Company with observed market volatility which is the volatility that is trading in the market at a point in time and the market's view of uncertainty in future prices.[8]
>
> Gulf: [Both] the variance and standard deviation of hedged and unhedged natural gas prices are calculated based on monthly values over a period of twelve months.[9]

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[6] FPL response to OPC's 10th Set of Interrogatories, Interrogatory No. 115.
[7] TECO Response to OPC's 3rd Set of Interrogatories, Interrogatory No. 39.
[8] DEF response to OPC's 3rd Set of Interrogatories, Interrogatory No. 40.
[9] Gulf Response to OPC's 3rd Set of Interrogatories, Interrogatory No. 40.

While there are differences in each of the Company's volatility estimates, all measures use a mathematical measure of dispersion variance and/or standard deviation applied to historical prices or prices of traded options.

As I discuss below, my review and analysis examines historical volatility in natural gas markets employing standard deviation utilizing daily, monthly, and annual data. These analyses demonstrate that volatility, as a measure of changes in gas market prices, is declining which is consistent with the significant market supply changes in the natural gas markets resulting from increased shale development since approximately 2007 – 2008. These analyses also show that price volatility concerns arose in the early 2000 period, when price hedging was viewed as a necessary mechanism by regulatory authorities in Florida and around the country for controlling fuel price changes, are no longer necessary given natural gas market changes.

SECTION IV: FLORIDA COMPANIES' HISTORICAL AND FUTURE HEDGING

Q. PROVIDE AN OVERVIEW OF WHAT THE FLORIDA COMPANIES ARE PROPOSING WITH REGARD TO FUTURE NATURAL GAS HEDGING.

A. A review of each Company's Risk Management Plan indicates more of the same of what was done in the past. In other words, there is no substantial change in their approaches to hedging. However, one difference is the provision that FPL will now incorporate the Woodford Project as part of its overall natural gas hedged quantities. Historically, substantial quantities of the expected natural gas burn quantities for each Company have been hedged. DEF, Gulf, and TECO provided their historical percentage of volume hedged to fuel consumed for the period 2002 to 2014.[10] Since 2010, these Companies have hedged from a low of 33% for Gulf in 2010 to a high of 72% for TECO in 2014. According to a recent news article, FPL hedges about 60% of its fuel purchases.[11] Despite incurring enormous hedging costs (losses) since 2011, no major changes are described or proposed in the 2016 utility hedging plans for the future.

The obvious problem with the Florida Companies' "more of the same" approach with regard to hedging is that such approaches have generated cumulative losses exceeding $1.8 billion for the period 2011 through 2014.[12] The recent 2015 hedging efforts are expected to produce additional opportunity costs to customers of approximately $646 million.[13] Continuing to implement the same hedging practices, without modification and despite the paradigm shift in the natural gas markets, are likely to bring consumers more of the same lost opportunities in terms of overall fuel costs.

Q. WHEN DID THE FLORIDA COMPANIES BEGIN NATURAL GAS HEDGING?

A. Based on a review of the discovery in this case, most risk management hedging efforts began in the 2001 to 2002 timeframe.[14] Given the starting date, my analyses of gas markets and volatility issues will cover the period 2000 through the present.

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[10] See DEF's, Gulf's, and TECO's Responses to OPC's 5th Set of Interrogatories, Interrogatory No. 71.

[11] "FPL says customers to save more in 2016 from utility's efficiency push" by Susan Salisbury, Palm Beach Post, September 2, 2015, *available at* http://www.mypalmbeachpost.com/news/business/fpl-says-customers-to-save-more-in-2016-from-utili/nnXKW/. Note: FPL's actual historical percentage of volume natural gas hedged to fuel consumed is confidential. See FPL's Response to OPC's 13th Set of Interrogatories, Interrogatory No. 148.

[12] See Table 1.

[13] *Id.*

[14] See TECO Response to OPC 3rd Set of Interrogatories, Interrogatory No. 37, DEF Response to OPC 3rd Set of

Q. WHAT ARE THE STATED GOALS OF THE FLORIDA COMPANIES' HEDGING PROGRAMS?

A. Based on a review of the discovery in this case, most risk management hedging objectives are to reduce fuel price volatility over time and to provide a greater degree of fuel price certainty.[15] FPL also notes that the "… goal is to execute a well-managed, non-speculative hedging program that is not intended to reduce fuel costs paid over time, but rather reduce the variability or volatility in fuel costs paid by customers over time."[16] Thus, the overriding concern in the risk management hedging programs (at least for FPL) is to limit fuel price variability impacts (volatility) and not fuel costs. Given the Companies' fuel price variability concerns, a significant factor in the hedging evaluation to be considered is whether price volatility concerns and issues are as important today as they have been in the past. It is also important to consider ongoing losses and the impact to consumers of paying substantially higher prices for fuel costs, especially if limiting potential fuel price volatility provides diminished and declining benefit. For example, if natural gas markets have expanded gas supply and the probability of market disruption is decreased, making unexpected price changes and spikes less and less likely, it may not make much sense to incur hundreds of millions of dollars in hedging costs through higher-than-market, locked-in or hedged, fuel costs.

Interrogatories, Interrogatory No. 37, FPL Response to OPC 10th Set of Interrogatories, Interrogatory No. 113, and Gulf Response to OPC 3rd Set of Interrogatories, Interrogatory No. 37. *See also* Order No. PSC-02-1484-FOF-EI, issued October 30, 2002, in Docket No. 011605-EI, In re: Review of investor-owned electric utilities' risk management policies and procedures.

[15] See TECO Response to OPC 3rd Set of Interrogatories, Interrogatory No. 38, DEF Response to OPC 3rd Set of Interrogatories, Interrogatory No. 38, FPL Response to OPC 10th Set of Interrogatories, Interrogatory No. 114, and Gulf Response to OPC 3rd Set of Interrogatories, Interrogatory No. 38.

[16] See FPL Response to OPC 10th Set of Interrogatories, Interrogatory No. 114.

Q. HOW DO THE FLORIDA COMPANIES EVALUATE EXPECTED PRICE VOLATILITY EACH YEAR TO DETERMINE THE EXTENT AND LEVEL OF HEDGING IN THEIR RESPECTIVE RISK MANAGEMENT PROGRAMS?

A. The short answer is: there is no analysis or evaluation being done. Instead, at the highest levels, hedging programs are implemented to limit volatility without consideration of market changes and/or expectations.[17] For example, on the issue of considering some acceptable level of volatility, Gulf stated: "[n]o target measurement of past fuel price volatility has been established that would preclude the Company from financially hedging future natural gas prices."[18]

DEF addressed this same issue by stating:

> As the **Company cannot predict future prices or actual volatility levels, defining a level of volatility that is acceptable is not possible.** What is known is that **prices are constantly changing and thus by definition contain volatility. The purpose of DEF's hedging program is to reduce that volatility by locking in prices.** Additionally, given the continued growth in natural gas generation for the Company and the State of Florida, the current level of natural gas prices, and the significant portion that natural gas makes up of the Company's fuel cost, **the Company believes that executing a hedging** program over time is a prudent risk management activity to reduce price volatility and create greater fuel cost certainty for customers.[19] (emphasis added)

It is difficult to envision something being more automatic at the macro level than DEF's hedging program described above. Certainly, it is a fact that market prices for natural

[17] See generally TECO Response to OPC 3rd Set of Interrogatories, Interrogatory No. 41, DEF Response to OPC 3rd Set of Interrogatories, Interrogatory No. 41, FPL Response to OPC 10th Set of Interrogatories, Interrogatory No. 117, and Gulf Response to OPC 3rd Set of Interrogatories, Interrogatory No. 41.
[18] See Gulf Response to OPC 3rd Set of Interrogatories, Interrogatory No. 41.
[19] See DEF Response to OPC 3rd Set of Interrogatories, Interrogatory No. 41.

gas, **like all markets, are constantly changing** and, as such, subject to some level of volatility. Given that the stated goal of hedging appears to be to mitigate volatility, which by definition **always exists,** it appears the hedging programs continue no matter the effectiveness and no matter the cost to consumers. I have found no cost/benefit evaluations of the hedging programs in Florida. Instead, the sole stated goal is to mitigate price volatility.

Q. DO THE FLORIDA COMPANIES' HEDGING PROGRAMS ACCOMPLISH THE GOAL OF LIMITING NATURAL GAS PRICE VOLATILITY?

A. Yes, it is an automatic result. Just as daily price changes by definition create the certainty of daily price volatility, locking-in and fixing future prices, rather than relying on day-to-day market prices, automatically reduces volatility. However, the fact that the result is automatic does not necessarily mean it is wise to hedge, especially in light of the decreasing need to hedge and the increasing cost to consumers resulting from automatic hedging activities.

Q. DID DEF EVALUATE THE ECONOMIC IMPACT OF THE DEF's AUTOMOATIC HEDGING ACTIVITIES FOR THE 2010 THROUGH 2014 PERIOD?

A. DEF readily acknowledges the automatic results of hedging and states:

> The Company's hedging plan reduces the risk of future price movements for a percentage of its forecasted burns by executing fix[ed] prices over time. No formal evaluation is necessary to reach this conclusion because by definition fixed prices are no longer subject to future price movements and as a result volatility and fuel cost price risk

> have been mitigated. ... DEF's hedging activities do not attempt to outguess the market and may or may not result in net fuel cost savings.[20]

DEF readily admits that the results of its hedging program are automatic, and no consideration of whether hedging is necessary, or cost effective for consumers, is ever undertaken.

Further, DEF addresses the fact that it ignores cost effectiveness considerations by stating:

> ... the purpose of hedging is to reduce the variability or volatility of fuel costs paid by customers over time and hedging does not involve speculating or attempting to anticipate the most favorable point in time to place hedges. Moreover, it is recognized that hedging can result in significant lost opportunities for savings in fuel costs paid by customers, and to balance the goal of reducing customers' exposure to rising fuel prices against the goal of allowing customers to benefit from falling prices, the Commission has recognized that it is appropriate to hedge only a portion of the total expected volume of fuel purchases.[21]

Hedging has the singular purpose of limiting or reducing price volatility without regard as to whether volatility is high, low, increasing, or declining. For example, under the DEF approach, prices can be expected to decline substantially, yet according to DEF, for some reason volatility in the price decline must be addressed by hedging and locking in future prices, thus risking the declining fuel cost benefit to consumers.

Q. ARE THERE ANY LIMITATIONS ON HEDGING IN THE RISK MANAGEMENT PLANS YOU EVALUATED?

A. The only limitation on hedging is to hedge less than 100 percent; however, even the percentage to hedge does not appear to be supported by any market analysis. There is

[20] See DEF Response to OPC 3rd Set of Interrogatories, Interrogatory No. 47.
[21] *Id.*

no consideration of changes in the market or any evaluation of the cost of hedging on consumers. Instead, the goal is to mitigate volatility (whether volatility is a problem or not) and hedge less than 100 percent of fuel requirements to reduce the adverse impacts of lost fuel opportunity costs.

Q. DID TECO EVALUATE THE ECONOMIC IMPACT OF THE TECO HEDGING ACTIVITIES FOR THE 2010 THROUGH 2014 PERIOD?

A. Yes, but only in part. TECO provided the economic impact of its hedging by stating:

> For 2010 through 2014, financial hedging of natural gas prices has lowered the standard deviation from 19 percent for monthly NYMEX natural gas settlement prices to 18 percent for monthly-hedged natural gas prices.[22]

Absent from TECO's hedging evaluation of a one percent decline in volatility is the fact that TECO consumers lost about $150.9 million in lower fuel costs because of the hedges during the 2010 through 2014 period.[23] The effect of limiting volatility by one percent at a consumer cost of $150.9 million is never considered in deciding whether to hedge or even how much to hedge.

Q. HOW DOES FPL EVALUATE THE ECONOMIC IMPACT OF ITS HEDGING ACTIVITIES FOR THE 2010 THROUGH 2014 PERIOD?

A. In terms of natural gas price volatility reduction during the 2010-2014 period, FPL states:

> Through its hedging program, FPL locks in the price of a percentage of its projected natural gas requirements. Having done so, it is a mathematical certainty that the variability/volatility in fuel costs will be

[22] See TECO Response to OPC 3rd Set of Interrogatories, Interrogatory No. 47.
[23] See TECO Response to OPC's 1st Set of Interrogatories No. 2.

> reduced because the fixed price hedge replaces the floating market price for the volume that is hedged. Therefore, the price of the hedged volumes can no longer move with fluctuating market prices ...[24]

However, FPL does not address that the consumer cost of the mathematical certainty of reducing volatility reduction in natural gas prices, i.e. higher fuel cost resulting from hedging, cost FPL consumers about $1.450 billion over the 2010 to 2014 period.[25] Based upon this substantial amount of higher fuel costs alone, it is difficult to discern a consumer benefit from hedging in the period since 2010.

Q. EARLIER YOU DISCUSSED HOW THE FLORIDA COMPANIES HEDGE LESS THAN 100 PERCENT OF THEIR FUEL REQUIREMENTS IN RECOGNITION OF POTENTIAL LOST FUEL COST BENEFITS WHEN MARKET PRICES ARE DECLINING. DOES THAT FACT MAKE A DIFFERENCE IN THE HEDGING EVALUATION?

A. No. First, there is a great deal of room between 1 percent and 100 percent hedging and, unfortunately, there is no analysis or basis that I have determined, in how the ultimate hedging percentage is established. For example, when gas markets have shown declining volatility and increased production and reserve levels with lower overall price levels (as the market exists today), one would expect to see less hedging. However, the Florida Companies are hedging more than ever without regard to market conditions or limited hedging needs. Further, there is no incentive to cease hedging because there

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[24] See FPL Response to OPC 10th Set of Interrogatories, Interrogatory No. 123.

[25] The Hedging Opportunity Losses are taken from the Responses to OPC's First Set of Interrogatories To FPL No. 26.

is virtually no risk of fuel cost disallowance for any hedging decision so long as the Companies follow their approved hedging plans.

SECTION V: ANALYSIS OF HISTORICAL PRICE VOLATILITY

Q. WHAT ISSUES DO YOU ADDRESS IN THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this part of my testimony is to review and summarize the historical volatility of the natural gas markets. The period covered by the Henry Hub database I employ is 1997 through July 2015. My general focus for this analysis is from January 2000 through July 2015. I address volatility and how it is measured along with the changes in volatility in the natural gas markets over time.

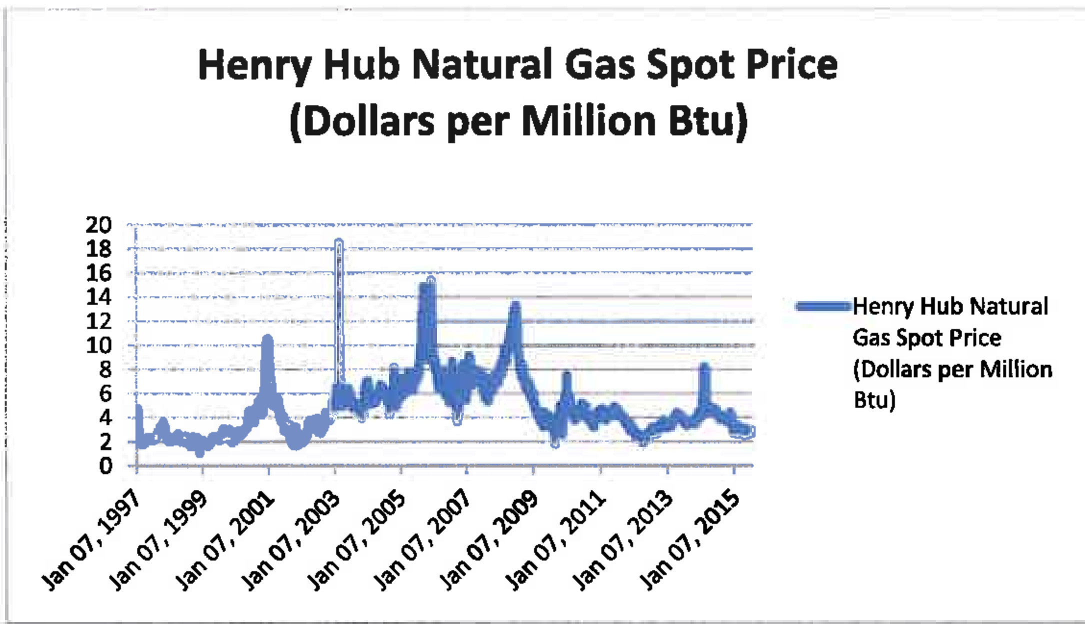
Q. PLEASE EXPLAIN HOW YOU MEASURE PRICE VOLATILITY FOR YOUR ANALYSIS.

A. My analysis of natural gas price volatility examined the changes in market prices for natural gas at the Henry Hub.[26] The data series of prices was extracted from the Energy Information Agency's ("EIA's") historical database and covered the period January 1, 1997 through July 31, 2015. The data examined over this time period consisted of daily, weekly, monthly, and annual natural gas price data. I have included in Table 2 below a graph of the Daily Henry Hub Spot Price for the period January 1997 through July 31, 2015.

[26] The Henry Hub pipeline is the pricing point for natural gas futures on the New York Mercantile Exchange (NYMEX). The settlement prices at the Henry Hub are used as benchmarks for the entire North American natural gas market.

The level of prices does not determine price volatility; rather, it is the degree of price variation one evaluates to determine price volatility. As shown in Table 2, from January 1, 1997 through July 31, 2015, the level of prices ranges from a high of over $18.00 to a low of under $2.00 per MMBtu, and the volatility changes substantially over time. Also, the trends in prices either increasing or decreasing do not necessarily indicate whether a market is volatile. Volatility is generally measured by the percent changes in day-to-day prices. A large price movement when prices are high may equate to the same volatility level as a smaller price movement when prices are at lower levels.

TABLE-2



Q. HAVE YOU REVIEWED ANY STUDIES THAT HAVE EVALUATED NATURAL GAS MARKET VOLATILITY?

A. Yes. One study that stands out is "*An Analysis of Price Volatility in Natural Gas Markets*" published by the EIA, Office of Oil and Gas in August 2007, which addresses gas market volatility in the January 1994 through December 2006 period. The purpose of the EIA volatility study was to "... address whether [or not] natural gas prices have been more volatile in recent years ..."[27] The EIA analysis found no increasing or decreasing trend in natural gas spot price volatility at the Henry Hub for the 1994 through 2006 period.[28]

For the analysis in this case, I utilize the same approaches for measuring volatility employed by EIA in their 1994 through 2006 volatility study. The goal of my review is to determine if there is a discernable trend in natural gas spot price volatility. If in fact a trend exists, that will be important information for the Commission to consider in terms of how fuel price hedging should be addressed in the future.

Q. HOW DID YOU MEASURE OR CALCULATE PRICE VOLATILITY FOR YOUR ANALYSIS?

A. To evaluate volatility trends, my analysis evaluated daily Henry Hub natural gas spot prices between January 1997 and July 31, 2015. The Henry Hub spot price data is available from the EIA at http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm. The Henry Hub is a primary trading location and, in my opinion, is representative of gas market prices that Florida companies encounter in the market.

Historical price volatility is defined as the standard deviation of the relative change in natural gas prices times a measure of trading days within the time period measured.[29]

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[27] "*An Analysis of Price Volatility in Natural Gas Markets,*" Energy Information Administration, Office of Oil and Gas, (August 2007) at 2.
[28] *Id.*
[29] *Id.*at 3.

Viewed as a formula, natural gas price volatility is the standard deviation of price change, where price change is measured as the day-to-day price change (p_t / p_{t-1})[30] A natural log transformation of the day-to-day price change is where: $\Delta p_t = \ln(p_t / p_{t-1})$[31] This log normal volatility measurement is similar to the statistical measure employed by Morningstar in its historical measures of stock price volatility[32] To annualize the volatility result, the resulting standard deviation of the price change calculation was multiplied times the square root of the ratio of 252 trading days by the number of trading days for the period examined. For this analysis, annual and monthly periods were examined.[33] The number of trading days employed for these analyses is 252 days for the annual analysis.[34]

One could measure volatility in terms of measuring the standard deviation of daily percentage price changes ((p_t / p_{t-1})-1) or daily absolute price changes (p_t - p_{t-1}). The relative historical relationships will remain the same so long as the volatility metric employed is consistently applied.

Q. DOES THE COMMODITY PRICE LEVEL DETERMINE VOLATILITY?

A. No. Volatility is generally defined by the degree of price variation in the market. Neither the absolute level of price nor the trend or direction of price determines

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[30] Where p_t is today's price and p_{t-1} is the prior day price.

[31] "*An Analysis of Price Volatility in Natural Gas Markets,*" Energy Information Administration, Office of Oil and Gas, (August 2007) at 3-4.

[32] Morningstar Investment Glossary, Historical Volatility at http:/www.morningstar.com/InvGlossary/historical_volatility.aspx

[33] "*An Analysis of Price Volatility in Natural Gas Markets,*" Energy Information Administration, Office of Oil and Gas, (August 2007) at 3-4.

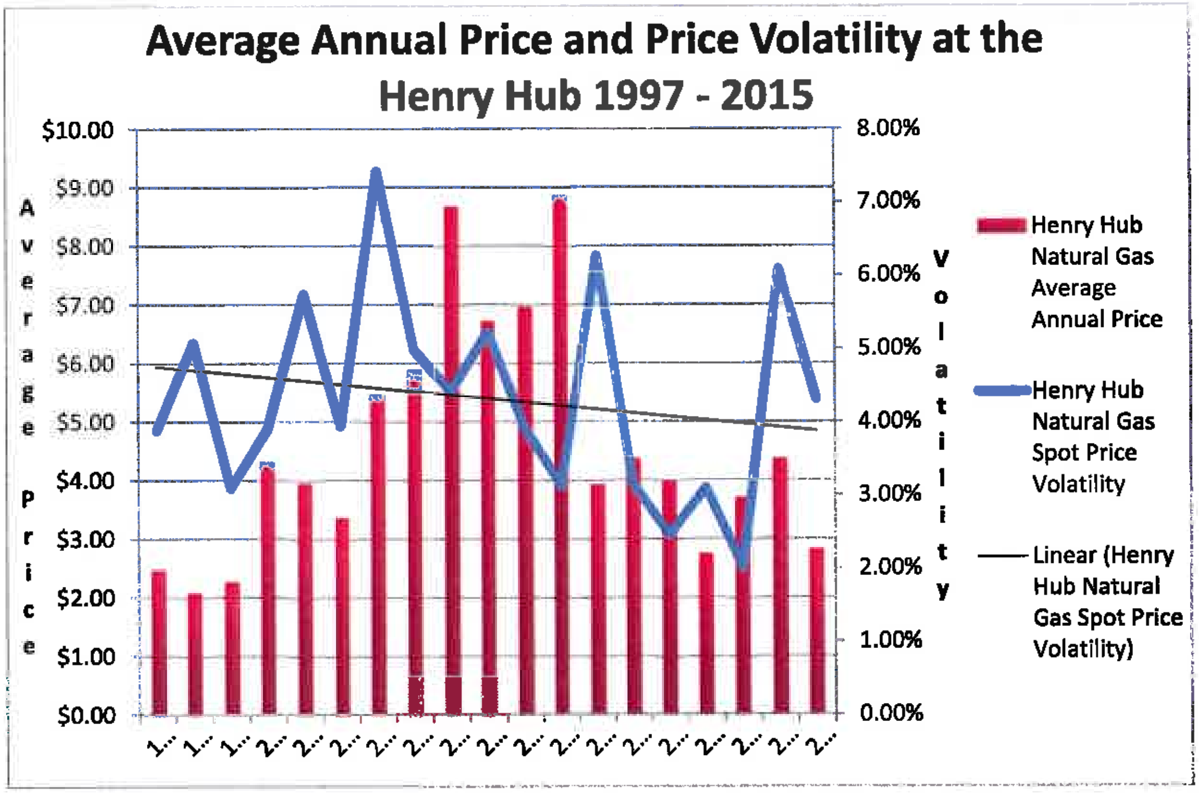
[34] *Id.* at 4.

volatility. Price volatility can be high or low when commodity prices are generally high, and price volatility can be equally high or low when commodity prices are low. Remember, volatility is a measure of change in the price of natural gas and not the actual price itself.

Q. PLEASE DESCRIBE YOUR ANNUAL PRICE VOLATILITY ANALYSIS AND THE RESULTS OF YOUR PRICE VOLATILITY CALCULATIONS ON THE NATURAL GAS MARKETS.

A. I have included in Schedule (DJL-2) the results of my annual volatility analysis of natural gas market price volatility for the period January 1997 through July 2015. The analysis demonstrates that volatility measure has declined by about 24 percent from the 2000 to 2010 period to the more recent 2011 to July 2015 period. The volatility trend is down, and average annual prices have declined 37.8 percent and are currently at some of the lowest levels in the 2000 to 2015 historical period. I have included in Table 3 a graphic depiction of average prices and price volatility measured on an annual basis over the 2000 to July 2015 time horizon. Schedule (DJL-2) also includes separate graphs of volatility and average price over the 2000 to 2015 period to capture the trends in each market variable.

TABLE-3



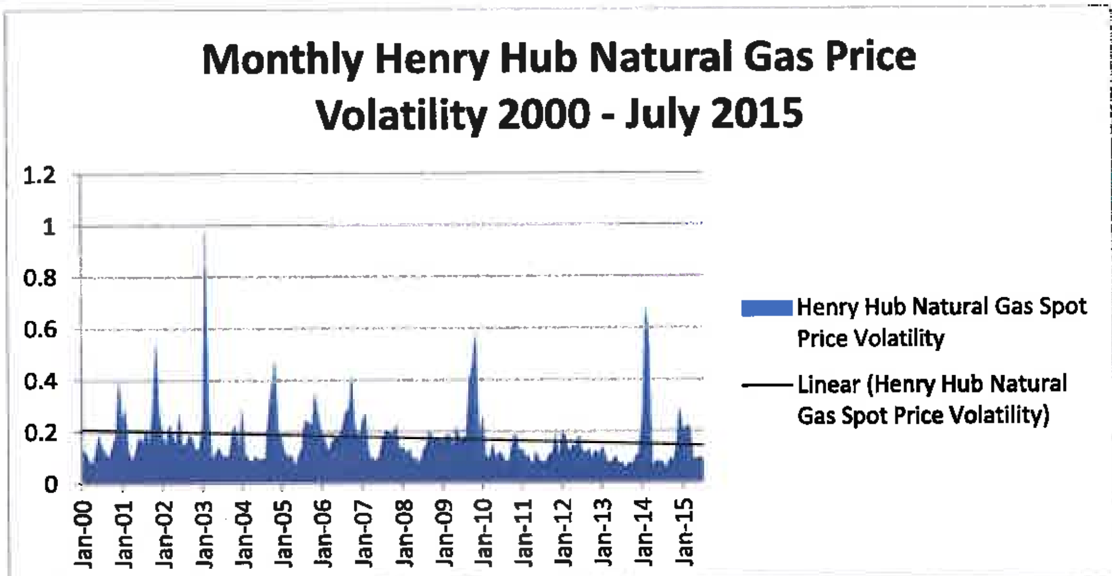
The declining trend in volatility and decreased levels of volatility are clearly discernable in the 2010 to 2015 time period. While 2014 is an outlier to this declining volatility trend; much of the 2014 price volatility is due to a few days in February and March 2014 reflecting extreme weather expectations (related to the polar vortex impacting much of the country). If the short-term, extreme weather event is removed, the 2014 price volatility would be consistent with the levels estimated for 2011, 2012, 2013, and 2015.

As discussed in the next Section of my testimony, the market changes from the supply side given expanded shale production and increased levels of reserves has led to decreased average annual prices and decreased levels of price volatility. Taking into account the increases in supply and increases in natural gas storage, the potential for short-term supply disruptions is reduced, which results in lower prices and less price volatility. When I discuss the more recent EIA forecasts of the gas markets, I will address this natural gas supply side impact on price and volatility.

Q. PLEASE DESCRIBE YOUR MONTHLY PRICE VOLATILITY ANALYSIS AND THE RESULTS OF YOUR PRICE VOLATILITY CALCULATIONS ON THE NATURAL GAS MARKETS.

A. I have also included in Schedule (DJL-3) the results of the monthly volatility and average price analyses for the period January 2000 through July 2015. All the calculations employed the same data and formulas as the annual approach except that monthly volatility estimates were annualized. Volatility, on a monthly basis, has declined by over 28.0 percent from the 2000 – 2010 period to the more recent 2011 – July 2015 as shown in Schedule (DJL-3). The volatility trend is down and average monthly prices have declined 36.8 percent and are currently at some of the lowest levels in the 2000 – 2015 historical period. I have included in Table 4 below a graphic depiction of average prices and price volatility measured on a monthly basis over the 2000 to July 2015 time horizon.

TABLE-4



Similar to the results of the annual analysis, the monthly evaluation also shows price volatility is declining. For the period 2011 – 2015, the amount of price dispersion is much less than the earlier historical period. Again, the February 2014 period reflects an outlier event explained by a few days of abnormal weather events impacting much of the country simultaneously. Schedule (DJL-3) contains more detailed analyses of the historical data that also shows the declining volatility and natural gas price trend.

In my opinion, these trends related to declining volatility and price are the result of changes in the natural gas markets resulting from the increased gas supply, more stable/less volatile gas prices, and lower gas prices, all of which are less subject to intermittent supply disruptions.

Q. PLEASE DESCRIBE YOUR MONTHLY PRICE VOLATILITY ANALYSES CONTAINED IN SCHEDULES (DJL-4) THROUGH (DJL-8).

A. These analyses are similar to the monthly analysis of natural gas price volatility discussed in Schedule (DJL-3) above. The difference is that I broke down the 1997 to 2015 period into five periods to show added detail and changes over time in the markets. Schedule (DJL-4) covers the 1997 to 1999 historical period, which is generally a pre-hedging period. As demonstrated in Schedule (DJL-4), natural gas prices remained relatively low throughout the period. Also, price volatility was relatively low except for January 1997 and March through June of 1998.

Schedule (DJL-5) examines the period 2000 to 2002. This is the period where natural gas hedging was implemented in many jurisdictions around the country and in Florida. Price levels increased during 2000 with price spikes at the end of that year. Also, the general level of volatility increased at the end of 2000 continuing into 2001.

Schedule (DJL-6) addresses the monthly volatility and average price levels in the 2003 to 2006 period. Average monthly price levels are substantially higher than prior periods and trending up over the period. Natural gas price volatility levels and ranges have increased during this period as well.

Schedule (DJL-7) reflects the monthly volatility and average price levels in the 2007 to 2010 period. This period covers increased natural gas shale development and, while average price and volatility is generally the same as the 2003 to 2006 period shown in

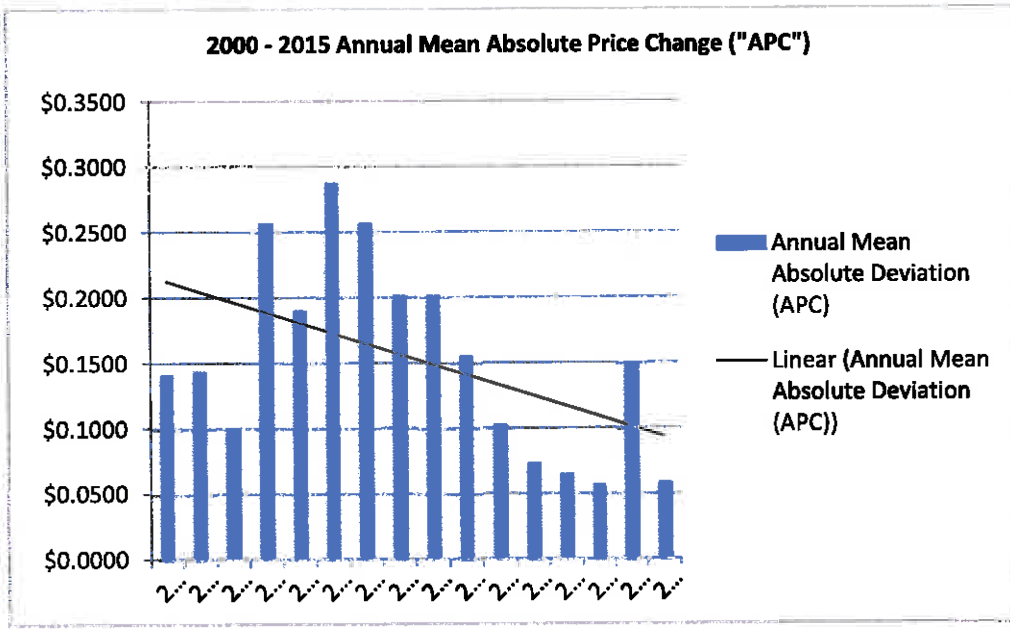
Schedule (DJL-6), the later months in Schedule (DJL-7) show lower price levels and a declining trend.

Schedule (DJL-8) covers the period 2011 through July 2015. In this period, average price levels are substantially below price levels since 2003. Further, the general level of volatility is well below all volatility levels experienced since 2000. The historical market data clearly demonstrates lower and declining average price levels and lower and declining price volatility levels.

Q. HAVE YOU PERFORMED ADDITIONAL ANALYSES OF GAS MARKET PRICES ADDRESSING VOLATILITY?

A. Yes. Below in Table 5 is an analysis of price variation considering the absolute value of the price changes. This analysis of absolute price change deviation differs from the previous analyses of percent changes in prices or volatility. The absolute price change ("APC") is determined by calculating the mean of the absolute day-to-day price movements at the Henry Hub. The APC was calculated for all days for the period 2000 – July 2015. Each year the annual average was calculated on the absolute value of price changes and the results are shown in Table 5 below:

TABLE-5



As shown in Table 5, the average absolute price change is less than 6 cents in 2013 and 2015, spiked in 2014 (due to extraordinary weather events), but overall shows a trend of a steady and steep decline from the early 2000's. I have included in Schedule (DJL-9) the underlying data and additional information related to the APC analysis. The bottom line is that the declining APC in market prices is consistent with the findings of a declining trend in gas price volatility discussed earlier.

Q. HAVE YOU REVIEWED ADDITIONAL EVIDENCE DEMONSTRATING DECLINING VOLATILITY OF GAS MARKET PRICES?

A. Yes. The findings of the declining average price deviation discussed above is reinforced by calculating the number of days in each calendar year that the absolute deviation in price from the previous day exceeds 25 cents, 50 cents, and $1 from 1997 through 2015.

Below in Table 6, I have included a tabulation of days where price deviations meet the criteria above for the period 2000 through July 2015:

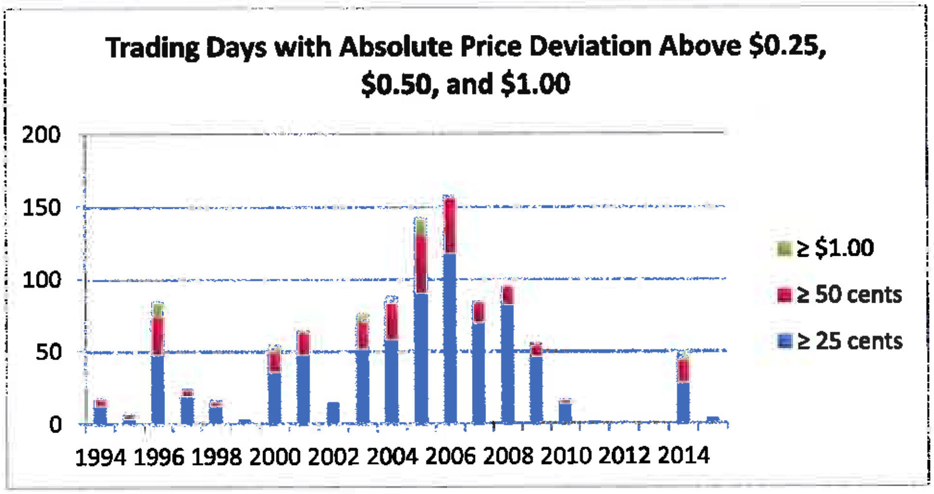
Table-6

Number of Trading Days with Absolute Price Deviations Meeting the Following Criteria			
YEAR	≥ 25 cents	≥ 50 cents	≥ $1.00
2000	35	14	6
2001	47	17	1
2002	15	0	0
2003	51	19	6
2004	58	25	5
2005	90	40	13
2006	117	39	2
2007	69	15	1
2008	82	13	0
2009	46	9	1
2010	13	3	1
2011	2	0	0
2012	1	0	0
2013	1	0	0
2014	28	15	7
2015	4	0	0

As shown in Table 6, since 2010 there are very few daily price movements that exceed 25 cents on a given day. Since 2011, there are no price movements that exceed 50 cents or $1.00 (except for the unusual events in 2014 discussed earlier). Given that the purpose of hedging, in my opinion, is to avoid **extreme price changes and price volatility**, Table 6 demonstrates extreme price changes are nonexistent since 2011 (except for the extraordinary events of 2014).

The raw data in Table 6 is summarized graphically in Table 7:

Table 7



As can be seen in Table 7 above, data in the years 2011, 2012, 2013, and 2015 barely register above zero, indicative of a substantial decline in large price movements.

Q. PLEASE SUMMARIZE YOUR EVALUATION OF HISTORICAL NATURAL GAS MARKET PRICES AND PRICE VOLATILITY.

A. The historical data demonstrates that natural gas market prices have generally declined to lower levels since 2011. More importantly, the historical data demonstrates that ***price volatility*** has substantially declined since 2011. The historical data demonstrates that the absolute level of price change has declined to lower levels relative to historic experiences. The size and frequency of average daily price changes has diminished to much lower levels demonstrating that price volatility has substantially declined.

Q. DOES THE FACT THAT THE HISTORICAL AND CURRENT TRENDS IN NATURAL GAS PRICES AND PRICE VOLATILITY ARE DECLINING MEAN THAT FUTURE PRICES AND PRICE VOLATILITY WILL CONTINUE TO DECLINE AND/OR REMAIN AT LOW LEVELS?

A. No. The fact that price levels and price volatility have declined does not necessarily mean that future price and volatility levels will remain low and/or continue to decline. Given that gas price levels and price volatility are driven by the supply and demand interaction in the market place, a review of the market and market expectations is important to make an assessment of what the future holds. Historically, short-term natural gas price levels and resulting volatility have been sensitive to short-run supply and/or demand shifts and disruptions. Due to the natural gas consumers' inability to fuel shift in the short run, supply and demand imbalances due to unexpected extreme weather or other demand disruption, combined with limited ability to expand short-run supply, have made gas markets significantly vulnerable to commodity price volatility. I discuss in the next section how market changes have substantially expanded the supply and availability of natural gas, leading to generally lower prices and decreased levels of volatility relative to the past.

SECTION VI: OVERVIEW OF CURRENT NATURAL GAS MARKETS

Q. HAVE ESTIMATES OF PROVED GAS RESERVES IN THE UNITED STATES INCREASED?

A. Yes. Proved reserves represent gas quantities that analyses show to be economically recoverable. Proved reserves have increased every year since 1999[35] The total natural gas proved reserves "… set a record of 354 trillion cubic feet ("Tcf") in 2013."[36] EIA's analysis indicates that "[m]ajor advances in natural gas exploration and production technologies has resulted in increased U.S. natural gas proved reserves."[37]

In terms of reserves, there are additional large volumes of natural gas referred to as "*undiscovered technically recoverable resources.*"[38] Such resources are expected to exist, as geological formations are favorable despite the uncertainty of the specific locations. The EIA estimated that as of January 2012 the U.S. "had 1,932 Tcf of undiscovered, technically recoverable resources of dry natural gas."[39] That is about 65 years' worth of gas, assuming a consumption level of 30 Tcf per year. Obviously, the actual number of years of gas supply will depend on annual gas consumption, gas imports and/or exports, and net additions to gas supply reserves each year.

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[35] "Natural Gas Explained", U.S. Energy Information Administration (February 2, 2015) at 1. URL: www.eia.gov/Energyexplained/index.cfm?page=natural_gas_reserves
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] *Id.*

Q. HAVE YOU REVIEWED THE FORECAST OF FUTURE NATURAL GAS MARKET PRICES AND SUPPLIES?

A. Yes. My first review examined the EIA Annual Energy Outlook 2011. This was the most current long-term forecast available to this Commission when the October 2011 Workshop reviewed hedging for Florida utilities. The EIA Annual Energy Outlook 2011 forecast estimated long-term growth (through 2035) in prices of 4.1%, production growth of 0.9%, reserves of 314 Tcf, and consumption levels growing through 2035 at 0.6%.[40]

The 2011 EIA forecast states the following regarding natural gas prospects in general and shale gas specifically:

> Unlike crude oil prices, natural gas prices do not return to the higher levels recorded before the 2007-2009 recession. ... The large difference between crude oil and natural gas prices results in a shift in drilling towards shale formations with high concentrations of liquids.
>
> **Shale gas continues to have enormous potential**....[41] (emphasis added)

Now, a short four years later, the 2015 EIA forecast estimates long-term natural gas growth in prices of 4.4% (through 2035), production growth of 1.5% (through 2035), consumption levels growing through 2035 at 0.4%[42] and gas reserve levels of 345 Tcf.[43] The following Table 8 summarizes the comparison of the 2011 and 2015 EIA forecasts

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[40] Annual Energy Outlook 2011, Energy Information Administration Table A1 p.115 and Table A13 & A14 pp. 142-143.

[41] *Id.* at 78-79.

[42] Annual Energy Outlook 2015, Energy Information Administration, Appendix A, Table A-1, The compound annual growth rate (CAGR) in nominal price of 4.4%, production 1.5%, and consumption 0.4% calculated between 2013 and 2035 from Appendix A, Table A-1.

[43] Id. Appendix A, Table A-14.

of natural gas prices, production, and reserves through 2030.

Table 8[44]

COMPARISON OF 2011 TO 2015 EIA NATURAL GAS ESTIMATES

	2011 EIA Forecast	2011 EIA Forecast	2015 EIA Forecast	2015 EIA Forecast
YEAR	FORECAST PRICE	PRODUCTION (Tcf)	FORECAST PRICE	PRODUCTION (Tcf)
2015	$5.09	23.01	$2.80 current price	24.40
2020	$6.10	24.04	$5.54	28.82
2025	$7.90	24.60	$6.72	30.51
2030	$9.28	25.75	$7.63	33.01

As demonstrated in the above chart, the EIA's current 2015 natural gas forecast estimates show increased production and lower prices in every year when compared to the 2011 EIA estimates. Generally, the stability and strength in the natural gas markets continue with the dramatic increases in production at lower price levels. Further, the declining prices estimates for natural gas are consistent with the historical record, showing declining prices, as discussed in Section III above. The natural gas market strength and maturity are also demonstrated by the continued increases in production in light of lower price forecast estimates.

[44] Annual Energy Outlook 2011, Energy Information Administration Table A1 p. 115-116, Annual Energy Outlook 2015, Energy Information Administration Tables A-14 and Table B-1. Note: Price value of $6.72 interpolated from 2020 and 2030 estimates.

Q. DO CURRENT FORECASTS OF NATURAL GAS MARKET PRICE, SUPPLY LEVELS, AND RESERVES SUGGEST THAT CONTINUATION OF FINANCIAL HEDGING WILL CONTINUE TO BE COSTLY TO FLORIDA CONSUMERS RELATIVE TO ANY POTENTIAL BENEFITS OF PRICE VOLATILITY REDUCTIONS?

A. Yes. As discussed above, current forecasts of natural gas markets indicate low and stable prices in the near term. These same forecasts also show plentiful supply and availability of natural gas and stable economic conditions. These forecasts indicate substantial changes (e.g., increased shale development) in natural gas markets have taken place since 2008 and 2011. Moreover, these current natural gas market forecasts demonstrate that the prior justifications and reasons for past natural gas hedging efforts (e.g., price volatility mitigation, threats to market supply, other factors influencing demand) are no longer available as reasons supporting the need to continue natural gas financial hedging activities. Given these current factors, it is more important than ever to consider the enormous opportunity costs incurred by consumers resulting from locking in fuel costs through hedging plans.

Q. IS THERE ADDITIONAL EVIDENCE THAT THE MARKET CHANGES YOU DISCUSSED HAVE HAD AN IMPACT ON NATURAL GAS PRICE VOLATILITY AND PRICE LEVELS?

A. Yes. A June 2013 Wall Street Journal article and analysis "*Volatility Evaporates in Natural-Gas Market*" describes and analyzes how price volatility has collapsed in the natural gas market. The article and analysis conclude that, "[b]ooming U.S. gas production has led to fewer supply disruptions, smoothing out the big ups and downs that once dominated the market for natural gas."[45] The Wall Street Journal analysis also noted that day-to-day price moves have declined each year since 2005.[46] As discussed earlier, the historical analyses demonstrate how the statistical metrics for natural gas price volatility is declining significantly each and every year. A review of the historical data discussed in Section III demonstrates this declining price variability to be a fact.

SECTION VII: <u>REGULATORY REVIEW OF FINANCIAL HEDGING</u>

Q. HAS THIS COMMISSION REVIEWED THE FLORIDA COMPANIES' HEDGING PROGRAMS?

A. Yes, this Commission reviews the Florida Companies' hedging proposals and Risk Management Plans each year in the fuel docket.

The Commission specifically reviewed the natural gas financial hedging issues in an October 2011 Workshop Session ("Workshop").[47] As I understand, the purpose of the Workshop was to:

> ... look at ... with the additional shale gas production ... any other changes that are out there, do we need to relook at how we're doing or what we're doing at this point ...[48]

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[45] "Volatility Evaporates in Natural-Gas Market," http://blogs.wsj.com/moneybeat/2013/06/06/volatility-evaporates-in-natural-gas-market/
[46] *Id.*
[47] New Issues In Hedging, Florida Public Service Commission, Undocketed Workshop, (October 4, 2011)
[48] Id. at 5:13-17 quoting Commissioner Balbis.

The Commission Staff further summarized the purpose of the Workshop:

> … this workshop is to discuss new information that may affect the hedging activities by the investor-owned utility companies. Today's topic for discussion include issues that affect natural gas price hedging since the issuance of Commission Order PSC-08-0667-PAA-EI on October 8, 2008. These topics include but are not limited to areas such as development of shale gas, natural gas price volatility, current state of the economy …[49]

Based on a review of the Workshop transcript, Mr. McCallister of Progress Energy (N/K/A DEF) proceeded to provide a joint investor-owned utility ("IOU") presentation addressing the Workshop topics.[50] Mr. McCallister's IOU presentation basically concluded that: "… developments in the natural gas markets do not warrant changes to the Commission's hedging policies and procedures that were established in 2008."[51]

The Companies' joint presentation addressed and emphasized growth in shale gas production.[52] The joint presentations also emphasized while "…natural gas prices and volatility have declined, it is impossible to predict to what magnitude circumstances may change and an increase in price and volatility."[53] Presented as examples of factors that could impact natural gas market output, prices, and price volatility were "[i]ncreased regulation of shale gas production,"[54] and the potential of LNG exports pressuring gas prices upwards.[55]

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[49] *Id.* at 6: 2-10 quoting Mr. Franklin Commission Staff.
[50] *Id.* at 6:10-12.
[51] *Id.* at 7:10-12.
[52] *Id.*
[53] *Id.* at 22: 14-17.
[54] *Id.* at 22: 17-18.
[55] *Id.* at 22: 19-21.

The IOU joint presentation basically concluded that:

> … developments in the natural gas market do not warrant changes to the Commission's hedging policies and procedures that were established in 2008. And as we stand today, the IOUs continue to implement their hedging programs consistent with those policies and procedures.[56]

Since the 2011 Commission Hedging Workshop, the IOU hedging programs were left intact, and were implemented by the IOUs, which brings us to the main issue in today's fuel docket proceeding – Is it in the consumers' best interest for the utilities to continue to financially hedge natural gas?

Q. HAVE THE FLORIDA IOUs INCURRED SUBSTANTIAL ADDITIONAL ABOVE MARKET NATURAL GAS COSTS SINCE THE OCTOBER 2011 WORKSHOP?

A. Yes. As shown in Section III above, since the October 2011 Workshop, the IOU's financial hedging efforts have collectively cost customers approximately $2.5 billion in increased gas fuel costs. Moreover, the historical facts demonstrate that natural gas price market volatility is declining from historical levels. Thus, since the October 2011 Commission Workshop, the cost/benefit evaluation of the natural gas financial hedging programs indicates a substantial cost to consumers with questionable benefits.

Q. HAVE OTHER REGULATORY COMMISSIONS ADDRESSED THE FINANCIAL HEDGING ISSUE?

A. Yes, the Kentucky and Nevada utility commissions have addressed hedging.

[56] *Id.* at 22:23 through 23:2.

Q. WOULD YOU DESCRIBE THE SITUATION IN KENTUCKY?

A. Yes. In recent gas cases in the state of Kentucky, the Kentucky Public Service Commission ordered that the then existing financial hedging programs should not be extended.[57] In the case of Columbia Gas of Kentucky, Inc., a gas utility proceeding, the Kentucky Commission concluded the following regarding financial hedging natural gas prices:

> … the Commission finds that Columbia's hedging program should not be extended. **The Commission finds that current conditions and the outlook for future natural gas supplies and price are sufficiently different in 2014 from what they were in 2001 to allay our concern regarding the potential adverse impact of price volatility and extreme winter spikes on customer bills. We therefore conclude that it is no longer reasonable to impose the cost attendant to hedging, to the extent there is net cost rather than net savings, to be passed along to Columbia's customers as part of their gas cost….**
>
> …
>
> While there is no guarantee that comparable [higher] prices and volatility will not recur, current projections from the United States Energy Information Administration's ("EIA") 2014 Annual Energy Outlook indicate prices not to exceed $8.00 per Mcf through 2040 using the reference case … More importantly with regard to volatility, the trend in price increases is projected to be gradual and steady in the long run.[58] (emphasis added)

The Kentucky Commission then issued an order that Columbia Gas "…cease hedging activities as of the date of this Order."[59]

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[57] See for example *Application of Columbia Gas of Kentucky, Inc. to Extend its Gas Price Hedging Plan,* Case No. 2013-00354 Final Order at 4 (September 17, 2014), also see *Application of Atmos Energy Corporation For Continuation Of Its Hedging Program,* Case No. 2013-00421, Final Order at 4, (September 18, 2014), also see *Application Duke Energy Kentucky, Inc. To Implement A Hedging program to Mitigate Price Volatility In the Procurement Of Natural Gas,* Case No. 2015-00025, Final order at 4, (May 27, 2015).
[58] *Application of Columbia Gas of Kentucky, Inc. to Extend its Gas Price Hedging Plan,* Case No. 2013-00354 Final Order at 4 (September 17, 2014).
[59] *Id.* at 7.

Contemporaneous with the Columbia Gas hedging issues, the Kentucky Commission addressed the same issue involving another Kentucky gas utility, Atmos Energy Corporation ("Atmos").[60] In the Atmos case, the Kentucky Commission stated:

> Based on the evidence of record … the Commission finds that Atmos' hedging program should not be extended. … **The Commission finds that current conditions and the outlook for future natural gas supplies and prices are sufficiently different in 2014 from what they were in 2001 to allay our concern regarding the potential adverse impact of price volatility on customer bills. We therefore conclude that it is no longer reasonable to impose the cost attendant to hedging** ….[61] (emphasis added)

On or about March 27, 2015, the Kentucky Commission addressed the Duke Energy Kentucky, Inc.'s ("DEK's") January 28, 2015 request to continue its gas hedging program for its gas utility for an additional three years through March 2018.[62] DEK is a combined electric and gas utility. In that proceeding, the Kentucky Commission noted that DEK "… declared its willingness to discontinue seeking to extend its [hedging] program if the Commission did not want the program to be continued."[63] The Kentucky Commission went on to state:

> The Commission's concern with regard to the extension of gas cost hedging programs, ….**continued low and stable gas prices could obviate the need for hedging.** This was the conclusion we reached in those cases and is the conclusion we now reach in this case. …The **Commission finds that current conditions and the outlook for future natural gas supplies and prices are sufficiently different in 2015 from what they were in 2001 to allay our concern regarding the potential adverse impact of price volatility on customer bills.**[64] (emphasis added)

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[60] *Application of Atmos Energy Corporation For Continuation Of Its Hedging Program*, Case No. 2013-00421, Final Order at 4, (September 18, 2014).
[61] *Id.* at 4-5.
[62] *Application Duke Energy Kentucky, Inc. To Implement A Hedging program to Mitigate Price Volatility In the Procurement Of Natural Gas*, Case No. 2015-00025, Final order at 1, (May 27, 2015).
[63] *Id.* at 3.
[64] *Id.* at 4.

The financial hedging programs for gas utility companies are no longer part of the fuel procurement process in Kentucky. Moreover, the current EIA forecasts demonstrate that gas market fuel supply is plentiful and gas price volatility is not the issue it once was.

Q. HAVE OTHER REGULATORY AUTHORITIES ENTERED RECENT ORDERS APPROVING THE CESSATION OF GAS HEDGING ACTIVITES?

A. Yes. On or about November 5, 2013, the Public Utilities Commission of Nevada ("Nevada Commission") approved a Stipulation of the parties that ceased the operation of the Southwest Gas hedging program.[65]

This approval of the Stipulation in the Southwest Gas case follows Nevada Commission Orders approving ending natural gas financial hedging for the two major electric utilities in Nevada.[66] There has been no financial gas hedging for these Nevada utility companies associated with natural gas procurement since the Nevada Commission issued the above referenced orders.

[65] Application of Southwest Gas Corporation to establish Base Tariff General rates, Unrecovered Gas Cost Expense rates, distribution shrinkage rates, commodity and reservation rates, and Renewable Energy Program rates, Before the Public Utilities Commission of Nevada, Docket No. 13-06006, Order approving Stipulation and Agreement at 3, 4, 13-14 (December 3, 2013).

[66] *See* Application of Sierra Pacific power Company d/b/a NV Energy for approval of its 2011-2013 Triennial Integrated Resource Plan, Docket No. 10-07003 (October 20, 2010), Compliance Order approving Amended and Re-stated Phase II (Energy Supply Plan) Stipulation at 4, 10-11, paragraph 10((a)-(g). *Also see* Application of Nevada Power Company d/b/a NV Energy for approval of its Energy Supply Plan Update for 2011-2012, Docket No. 10-09003, Order approving Stipulation at 2 (December 16, 2010); *See* Stipulation at 2-3, paragraph 1 (a)-(f).

Q. ARE YOU AWARE OF OTHER REGULATORY AUTHORITIES THAT DO NOT ALLOW FINANCIAL HEDGING IN THE NATURAL GAS PROCUREMENT PROCESS?

A. Yes. The Public Utility Commission of Texas historically has not authorized the regulated fully integrated electric utilities in areas outside of the Electric Reliability Council of Texas to employ financial hedging in the fuel procurement activities of the utility. The Railroad Commission of Texas, the regulatory authority charged with regulating gas utility companies in Texas has not pre-approved a gas utility company including expenses of financial hedges (including the increased expense of an out of money hedge) from gas or fuel adjustment clauses.[67] CenterPoint Energy Texas has elected to not employ financial hedging as a fuel procurement strategy.

It is true that most regulatory authorities authorize utility companies to employ some form of financial hedging in fuel procurement. However, those regulatory authorities which have recently taken up and ruled on this financial hedging question (like Kentucky and Nevada) have concluded that, given current gas market conditions and forecasts, there is no need for financial hedging in the gas procurement process.

Q. HAVE ADDITIONAL UTILITIES CONSIDERED THE NATURAL GAS MARKET CHANGES AND SUSPENDED HEDGING ACTIVITIES?

A. Yes. Colorado Springs Utilities is an example of a utility that in 2009 considered

[67] Statement of Intent of CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Entex and CenterPoint Energy Texas Gas To Increase rates On A Division-Wide Basis In The Houston Division, Railroad Commission of Texas, Gas Utilities docket No. 9902 (Consolidated), Final Order at 12, FoF 103, (February 23, 2010).

declining gas market costs and reviewed the merits of its hedging program, and in 2010 reduced the volumes and lengths of its hedges. Subsequently, after added market review and the recognition of gas market stability, Colorado Springs Utilities suspended all hedging in 2011, allowing its hedged supply contracts to expire in 2013.[68]

Q. IN YOUR OPINION, HAS THE NATURAL GAS MARKET SUBSTANTIALLY CHANGED SINCE THE FLORIDA COMMISSION'S 2011 FUEL HEDGING WORKSHOP?

A. Yes. As outlined in the Kentucky Commission Orders discussed earlier and shown in the analysis presented in my testimony, the natural gas markets have changed substantially over the past few years. The recent and current EIA forecasts show that natural gas production has substantially increased, probable and recoverable gas reserves for the future have increased substantially, forward estimates of natural gas prices have declined and become more stable, and price volatility has declined. Based on these factors, some regulatory authorities and utilities have concluded financial hedging is no longer necessary and moreover is no longer worth the risks or costs associated with financial hedging.

[68] Colorado Springs Utilities web page "Natural gas hedging program," www.csu.org/Pages/nghedging.aspx

SECTION VIII: AN ALTERNATIVE APPROACH TO PRICE VOLATILITY

Q. WHAT ISSUE(S) ARE YOU ADDRESSING IN THIS SECTION OF YOUR TESTIMONY?

A. The issues addressed in this Section of my testimony consider – in light of recent historical events in the natural gas markets with low natural gas price volatility, stable markets with limited disruptions, increased supply and growing natural gas reserves, and stable gas prices – what alternatives to financial gas hedging are available to address gas price volatility?

Q. HAVE ANY OF THE FLORIDA COMPANIES PREVIOUSLY PROPOSED ALTERNATIVES TO FINANCIAL HEDGING THAT WOULD ADDRESS FUEL PRICE VOLATILITY IMPACTS ON CONSUMERS?

A. Yes. In 2008, FPL proposed a volatility mitigation mechanism ("VMM") as an alternative to FPL's financial and physical fuel price hedging programs.[69] FPL later withdrew its request for a VMM and proposed hedging guidelines to govern the regulatory risk associated with its prior hedging program.[70] In its VMM proposal, FPL noted concerns related to asymmetric risks and rewards under FPL's hedging program.[71] FPL stated "… hedging the prices FPL pays for fuel, that is not necessarily the only or best approach."[72] FPL went on to state:

> FPL has concluded that the volatility in customer fuel charges can be mitigated almost as effectively as it has under FPL's current hedging

[69] Notice of Proposed Agency Action Order Clarifying Hedging Order And Providing Guidelines, Docket No. 080001-EI (October 2008) at 2.
[70] *Id.* at 3.
[71] Petition of Florida Power & Light for Approval of Improved Volatility Mitigation Mechanism, Docket No. 080001-EI (January 31, 2008) at 4.
[72] *Id.* at 7.

> program, by collecting under-recoveries of unhedged fuel costs over two years instead of one year … other aspects of the fuel clause would continue to work as they do currently.[73]

In terms of benefits of the VMM versus hedging, FPL noted the following: (i) FPL customers would avoid transaction costs associated with hedging, (ii) FPL customers would no longer pay risk premiums for fuel costs, (iii) deferred two-year fuel under-recoveries are financed at the low cost commercial paper interest rate; (iv) over-recoveries would flow back to FPL customers over one-year per the fuel rule; and (v) more opportunities for FPL customers to benefit promptly and completely from short-term price declines.[74]

Given the substantial changes in the natural gas markets regarding price, production, supply, and overall market stability, and given current forecasts of stable natural gas markets, and given the enormous customer higher-than-market fuel opportunity costs experienced since 2011, an alternative such as the FPL proposed VMM in 2008 is better than the *status quo* automatic hedging required by the Companies' Risk Management Plans.

Each year, the Commission reviews fuel costs and determines the appropriate amount of over/(under) fuel recovery. However, to the extent the Commission determines a large or material under-recovery of fuel costs has occurred, the Commission *in its regulatory discretion* can determine, without formally adopting FPL's 2008 VMM

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[73] *Id.* at 7.
[74] *Id.* at 8-9.

proposal, whether a large under-recovery should be recovered over a one-year or longer period. Such an efficient, rational approach curbs the impact of price volatility on customers without the negative impacts of financial hedging.

Q. ARE YOU RECOMMENDING THAT THE COMMISSION ADOPT FPL'S 2008 VMM PROPOSAL OR A SIMILAR MECHANISIM?

A. No. I am recommending that the Commission deny approval of the Companies' 2016 Risk Management Plans, and order the Companies to discontinue financial hedging of natural gas.

SECTION IX: <u>CONCLUSIONS AND RECOMMENDATIONS</u>

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS REGARDING NATURAL GAS FINANCIAL HEDGING.

A. Since this Commission's first order on hedging in 2002, natural gas markets have changed substantially. Natural gas prices, production, and supply are not as volatile as was experienced in the early 2000 time frame. Current gas market forecasts do not estimate volatile markets, but instead predict increased production at lower prices than earlier forecasts. Historical evidence since 2000 shows volatility in the gas markets to be declining. The historical cost of hedging in terms of paying higher-than-market prices for fuel has been staggering to Florida consumers for the past 12 years. A fair balancing of the declining volatility and declining hedging benefits to consumers against the substantial costs of hedging suggest that the cost/benefit assessment does not support future hedging. For all of the above reasons, I recommend that the Companies' proposed financial hedging plans not be approved and that financial hedging of natural gas should be discontinued on a going-forward basis. If circumstances change substantially, hedging can be visited again in the future.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

DANIEL J. LAWTON
B.A. ECONOMICS, MERRIMACK COLLEGE
M.A. ECONOMICS, TUFTS UNIVERSITY

Prior to beginning his own consulting practice Diversified Utility Consultants, Inc., in 1986 where he practiced as a firm principal through December 31, 2005, Mr. Lawton had been in the utility consulting business with a national engineering and consulting firm. In addition, Mr. Lawton has been employed as a senior analyst and statistical analyst with the Department of Public Service in Minnesota. Prior to Mr. Lawton's involvement in utility regulation and consulting he taught economics, econometrics, statistics and computer science at Doane College.

Mr. Lawton has conducted numerous revenue requirements, fuel reconciliation reviews, financial, and cost of capital studies on electric, gas and telephone utilities for various interveners before local, state and federal regulatory bodies. In addition, Mr. Lawton has provided studies, analyses, and expert testimony on statistics, econometrics, accounting, forecasting, and cost of service issues. Other projects in which Mr. Lawton has been involved include rate design and analyses, prudence analyses, fuel cost reviews and regulatory policy issues for electric, gas and telephone utilities. Mr. Lawton has developed software systems, databases and management systems for cost of service analyses.

Mr. Lawton has developed and numerous forecasts of energy and demand used for utility generation expansion studies as well as municipal financing. Mr. Lawton has represented numerous municipalities as a negotiator in utility related matters. Such negotiations ranges from the settlement of electric rate cases to the negotiation of provisions in purchase power contracts.

In addition to rate consulting work Mr. Lawton through the Lawton Law Firm represents numerous municipalities in Texas before regulatory authorities in electric and gas proceedings. Mr. Lawton also represents municipalities in various contract and franchise matters involving gas and electric utility matters.

A list of cases in which Mr. Lawton has provided testimony is attached.

UTILITY RATE PROCEEDINGS IN WHICH TESTIMONY HAS BEEN PRESENTED BY DANIEL J. LAWTON

JURISDICTION/COMPANY	DOCKET NO.	TESTIMONY TOPIC
ALASKA REGULATORY COMMISSION		
Beluga Pipe Line Company	P-04-81	Cost of Capital
Municipal Light & Power	U-13-184	Cost of Capital
Enstar Natural Gas Co.	U-14-111	Cost of Capital

PUBLIC UTILITIES COMMISSION OF CALIFORNIA		
Southern California Edison	12-0415	Cost of Capital
San Diego Gas and Electric	12-0416	Cost of Capital
Southern California Gas	12-0417	Cost of Capital
Pacific Gas and Electric	12-0418	Cost of Capital

GEORGIA PUBLIC SERVICE COMMISSION		
Georgia Power Co.	25060-U	Cost of Capital

FEDERAL ENERGY REGULATORY COMMISSION		
Alabama Power Company	ER83-369-000	Cost of Capital
Arizona Public Service Company	ER84-450-000	Cost of Capital
Florida Power & Light	EL83-24-000	Cost Allocation, Rate Design
Florida Power & Light	ER84-379-000	Cost of Capital, Rate Design, Cost of Service
Southern California Edison	ER82-427-000	Forecasting

LOUISIANA PUBLIC SERVICE COMMISSION		
Louisiana Power & Light	U-15684	Cost of Capital, Depreciation
Louisiana Power & Light	U-16518	Interim Rate Relief
Louisiana Power & Light	U-16945	Nuclear Prudence, Cost of Service

MARYLAND PUBLIC SERVICE COMMISSION		
Baltimore Gas and Electric Company	9173	Financial
Baltimore Gas and Electric Company	9326	Financial

MINNESOTA PUBLIC UTILITIES COMMISSION		
Continental Telephone	P407/GR-81-700	Cost of Capital
Interstate Power Co.	E001/GR-81-345	Financial
Montana Dakota Utilities	G009/GR-81-448	Financial, Cost of Capital
New ULM Telephone Company	P419/GR81767	Financial
Norman County Telephone	P420/GR-81-230	Rate Design, Cost of Capital
Northern States Power	G002/GR80556	Statistical Forecasting, Cost of Capital
Northwestern Bell	P421/GR80911	Rate Design, Forecasting

MISSOURI PUBLIC SERVICE COMMISSION		
Missouri Gas Energy	GR-2009-0355	Financial
Ameren UE	ER-2010-0036	Financial

FLORIDA PUBLIC SERVICE COMMISSION		
Progress Energy	070052-EI	Cost Recovery
Florida Power and Light	080677-EI	Financial
Florida Power and Light	090130-EI	Depreciation
Progress Energy	090079-EI	Depreciation
Florida Power and Light	120015-EI	Financial Metrics
Florida Power and Light	140001-EI	Economic and Regulatory Policy Issues

NORTH CAROLINA UTILITIES COMMISSION		
North Carolina Natural Gas	G-21, Sub 235	Forecasting, Cost of Capital, Cost of Service

OKLAHOMA PUBLIC SERVICE COMMISSION		
Arkansas Oklahoma Gas Corporation	200300088	Cost of Capital
Public Service Company of Oklahoma	200600285	Cost of Capital
Public Service Company of Oklahoma	200800144	Cost of Capital
Public Service Company of Oklahoma	201200054	Financial and Earnings Related

PUBLIC SERVICE COMMISSION OF INDIANA		
Kokomo Gas & Fuel Company	38096	Cost of Capital

PUBLIC UTILITY COMMISSION OF NEVADA		
Nevada Bell	99-9017	Cost of Capital
Nevada Power Company	99-4005	Cost of Capital
Sierra Pacific Power Company	99-4002	Cost of Capital
Nevada Power Company	08-12002	Cost of Capital
Southwest Gas Corporation	09-04003	Cost of Capital
Sierra Pacific Power Company	10-06001 & 10-06002	Cost of Capital & Financial
Nevada Power Co. and Sierra Pacific Power Co.	11-06006 11-06007 11-06008	Cost of Capital
Southwest Gas Corp.	12-04005	Cost of Capital
Sierra Power Company	13-06002 13-06003 13-06003	Cost of Capital
NV Energy & MidAmerican Energy Holdings Co.	13-07021	Merger and Public Interest Financial

PUBLIC SERVICE COMMISSION OF UTAH		
PacifiCorp	04-035-42	Cost of Capital
Rocky Mountain Power	08-035-38	Cost of Capital
Rocky Mountain Power	09-035-23	Cost of Capital
Rocky Mountain Power	10-035-124	Cost of Capital
Rocky Mountain Power	11-035-200	Cost of Capital

Questar Gas Company	13-057-05	Cost of Capital
Rocky Mountain Power	13-035-184	Cost of Capital

SOUTH CAROLINA PUBLIC SERVICE COMMISSION		
Piedmont Municipal Power	82-352-E	Forecasting

PUBLIC UTILITY COMMISSION OF TEXAS		
Central Power & Light Company	6375	Cost of Capital, Financial Integrity
Central Power & Light Company	9561	Cost of Capital, Revenue Requirements
Central Power & Light Company	7560	Deferred Accounting
Central Power & Light Company	8646	Rate Design, Excess Capacity
Central Power & Light Company	12820	STP Adj. Cost of Capital, Post Test-year adjustments, Rate Case Expenses
Central Power & Light Company	14965	Salary & Wage Exp., Self-Ins. Reserve, Plant Held for Future use, Post Test Year Adjustments, Demand Side Management, Rate Case Exp.
Central Power & Light Company	21528	Securitization of Regulatory Assets
El Paso Electric Company	9945	Cost of Capital, Revenue Requirements, Decommissioning Funding
El Paso Electric Company	12700	Cost of Capital, Rate Moderation Plan, CWIP, Rate Case Expenses
Entergy Gulf States Incorporated	16705	Cost of Service, Rate Base, Revenues, Cost of Capital, Quality of Service
Entergy Gulf States Incorporated	21111	Cost Allocation
Entergy Gulf States Incorporated	21984	Unbundling
Entergy Gulf States Incorporated	22344	Capital Structure

Entergy Gulf States Incorporated	22356	Unbundling
Entergy Gulf States Incorporated	24336	Price to Beat
Gulf States Utilities Company	5560	Cost of Service
Gulf States Utilities Company	6525	Cost of Capital, Financial Integrity
Gulf States Utilities Company	6755/7195	Cost of Service, Cost of Capital, Excess Capacity
Gulf States Utilities Company	8702	Deferred Accounting, Cost of Capital, Cost of Service
Gulf States Utilities Company	10894	Affiliate Transaction
Gulf States Utilities Company	11793	Section 63, Affiliate Transaction
Gulf States Utilities Company	12852	Deferred acctng., self-Ins. reserve, contra AFUDC adj., River Bend Plant specifically assignable to Louisiana, River Bend Decomm., Cost of Capital, Financial Integrity, Cost of Service, Rate Case Expenses
GTE Southwest, Inc.	15332	Rate Case Expenses
Houston Lighting & Power	6765	Forecasting
Houston Lighting & Power	18465	Stranded costs
Lower Colorado River Authority	8400	Debt Service Coverage, Rate Design
Southwestern Electric Power Company	5301	Cost of Service
Southwestern Electric Power Company	4628	Rate Design, Financial Forecasting
Southwestern Electric Power Company	24449	Price to Beat Fuel Factor
Southwestern Bell Telephone Company	8585	Yellow Pages
Southwestern Bell Telephone Company	18509	Rate Group Re-Classification
Southwestern Public Service Company	13456	Interruptible Rates

Southwestern Public Service Company	11520	Cost of Capital
Southwestern Public Service Company	14174	Fuel Reconciliation
Southwestern Public Service Company	14499	TUCO Acquisition
Southwestern Public Service Company	19512	Fuel Reconciliation
Texas-New Mexico Power Company	9491	Cost of Capital, Revenue Requirements, Prudence
Texas-New Mexico Power Company	10200	Prudence
Texas-New Mexico Power Company	17751	Rate Case Expenses
Texas-New Mexico Power Company	21112	Acquisition risks/merger benefits
Texas Utilities Electric Company	9300	Cost of Service, Cost of Capital
Texas Utilities Electric Company	11735	Revenue Requirements
TXU Electric Company	21527	Securitization of Regulatory Assets
West Texas Utilities Company	7510	Cost of Capital, Cost of Service
West Texas Utilities Company	13369	Rate Design

	RAILROAD COMMISSION OF TEXAS	
Energas Company	5793	Cost of Capital
Energas Company	8205	Cost of Capital
Energas Company	9002-9135	Cost of Capital, Revenues, Allocation
Lone Star Gas Company	8664	Rate Design, Cost of Capital, Accumulated Depr. & DFIT, Rate Case Exp.
Lone Star Gas Company-Transmission	8935	Implementation of Billing Cycle Adjustment
Southern Union Gas Company	6968	Rate Relief

Southern Union Gas Company	8878	Test Year Revenues, Joint and Common Costs
Texas Gas Service Company	9465	Cost of Capital, Cost of Service, Allocation
TXU Lone Star Pipeline	8976	Cost of Capital, Capital Structure
TXU-Gas Distribution	9145-9151	Cost of Capital, Transport Fee, Cost Allocation, Adjustment Clause
TXU-Gas Distribution	9400	Cost of Service, Allocation, Rate Base, Cost of Capital, Rate Design
Westar Transmission Company	4892/5168	Cost of Capital, Cost of Service
Westar Transmission Company	5787	Cost of Capital, Revenue Requirement
Atmos	10000	Cost of Capital

TEXAS WATER COMMISSION		
Southern Utilities Company	7371-R	Cost of Capital, Cost of Service

SCOTSBLUFF, NEBRASKA CITY COUNCIL		
K. N. Energy, Inc.		Cost of Capital

HOUSTON CITY COUNCIL		
Houston Lighting & Power Company		Forecasting

PUBLIC UTILITY REGULATION BOARD OF EL PASO, TEXAS		
Southern Union Gas Company		Cost of Capital

DISTRICT COURT CAMERON COUNTY, TEXAS		
City of San Benito, et. al. vs. PGE Gas Transmission et. al.	96-12-7404	Fairness Hearing

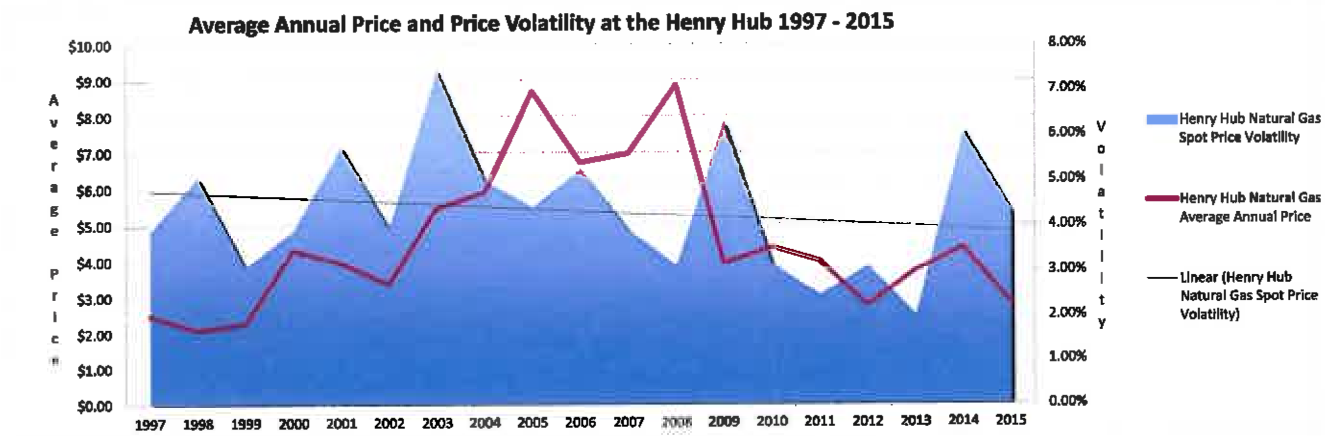
DISTRICT COURT HARRIS COUNTY, TEXAS		
City of Wharton, et al vs. Houston Lighting & Power	96-016613	Franchise fees

DISTRICT COURT TRAVIS COUNTY, TEXAS		
City of Round Rock, et al vs. Railroad Commission of Texas et al	GV 304,700	Mandamus

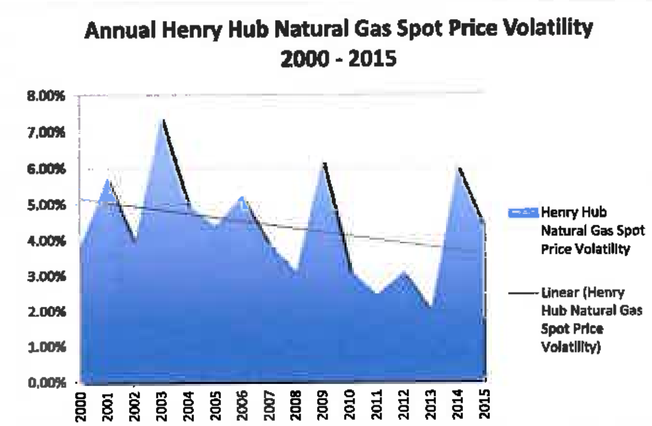
SOUTH DAYTONA, FLORIDA		
City of South Daytona v. Florida Power and Light	2008-30441-CICI	Stranded Costs

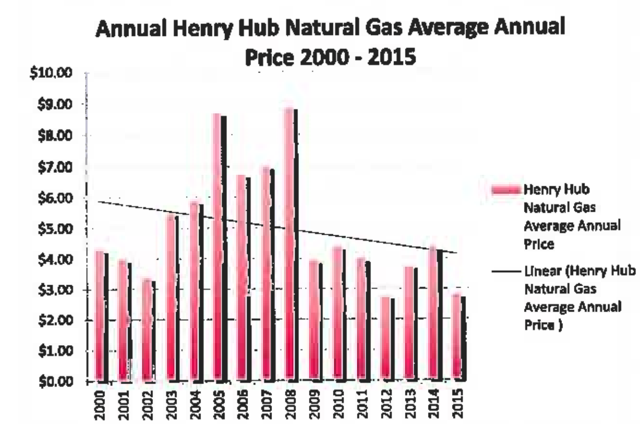
1997 - 2015 Henry Hub Natural Gas Price Historical Average Price and Price Volatility Measured Annually

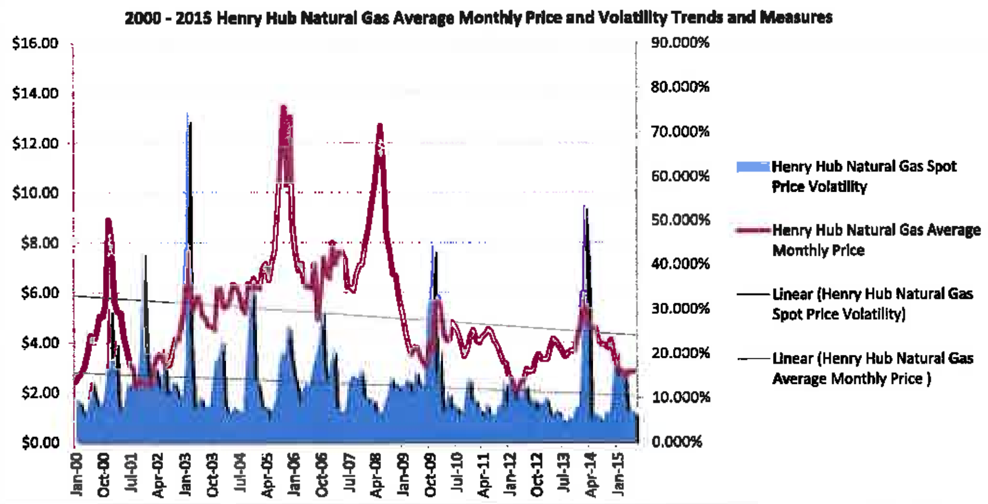
Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Natural Gas Average Annual Price
1997	3.86%	$2.49
1998	5.06%	$2.09
1999	3.09%	$2.27
2000	3.89%	$4.31
2001	5.74%	$3.96
2002	3.94%	$3.38
2003	7.42%	$5.47
2004	4.98%	$5.89
2005	4.40%	$8.69
2006	5.23%	$6.73
2007	3.90%	$6.97
2008	3.11%	$8.86
2009	6.26%	$3.94
2010	3.14%	$4.37
2011	2.45%	$4.00
2012	3.09%	$2.75
2013	2.00%	$3.73
2014	6.08%	$4.37
2015	4.31%	$2.82
2000 to 2010	4.73%	$5.69
2011 to 2015	3.59%	$3.54
Change	-24.16%	-37.84%

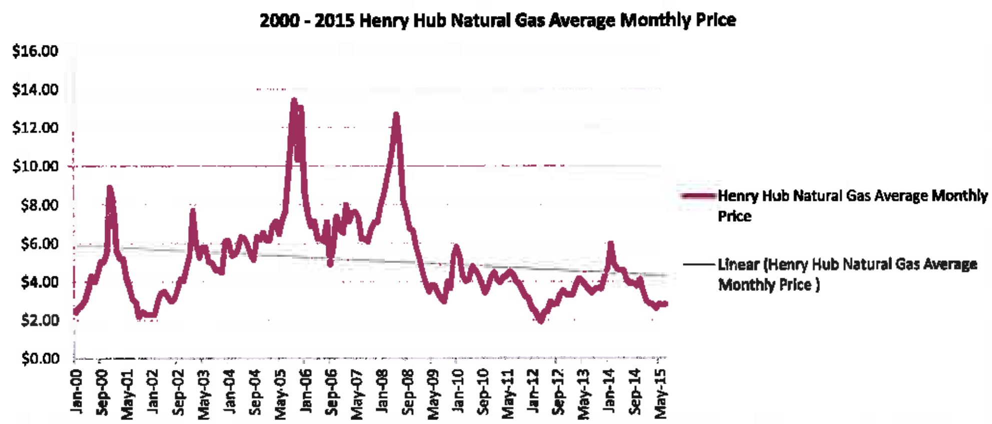


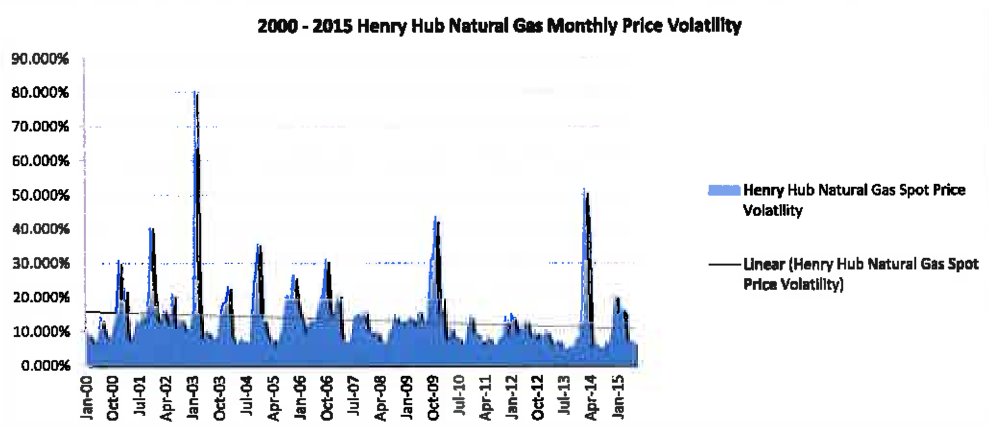
Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Natural Gas Average Annual Price
2000	3.89%	$4.31
2001	5.74%	$3.96
2002	3.94%	$3.38
2003	7.42%	$5.47
2004	4.98%	$5.89
2005	4.40%	$8.69
2006	5.23%	$6.73
2007	3.90%	$6.97
2008	3.11%	$8.86
2009	6.26%	$3.94
2010	3.14%	$4.37
2011	2.45%	$4.00
2012	3.09%	$2.75
2013	2.00%	$3.73
2014	6.08%	$4.37
2015	4.31%	$2.82





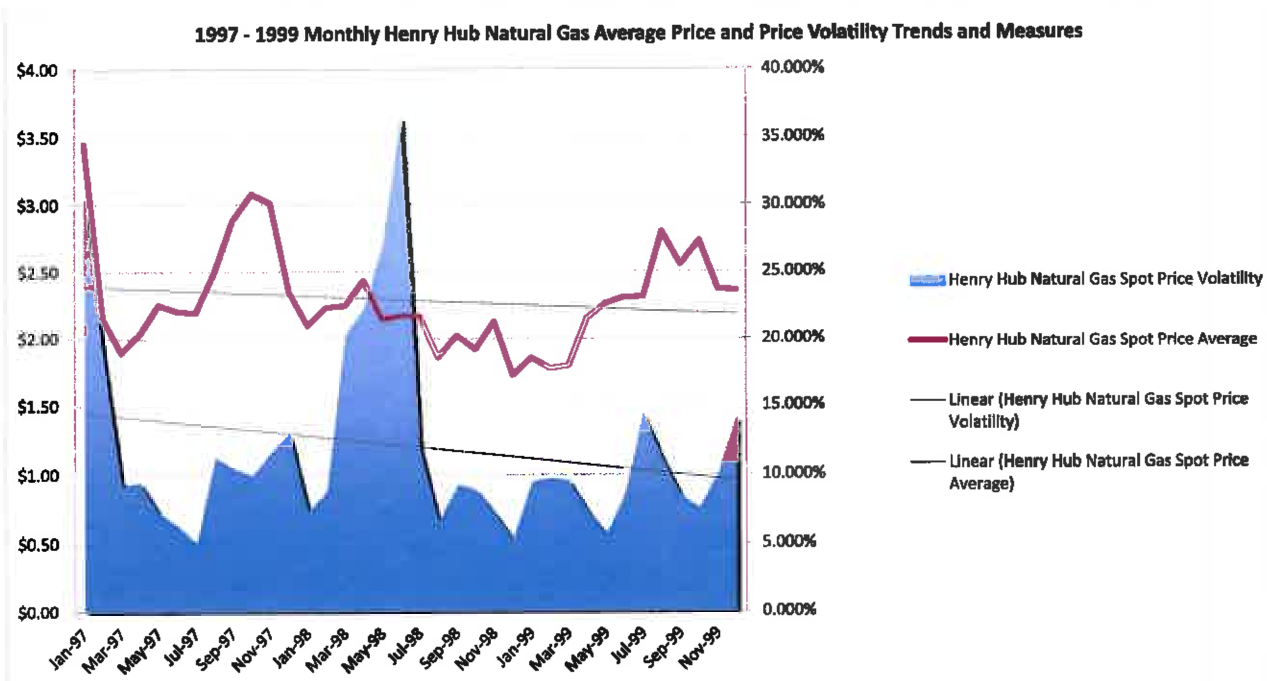




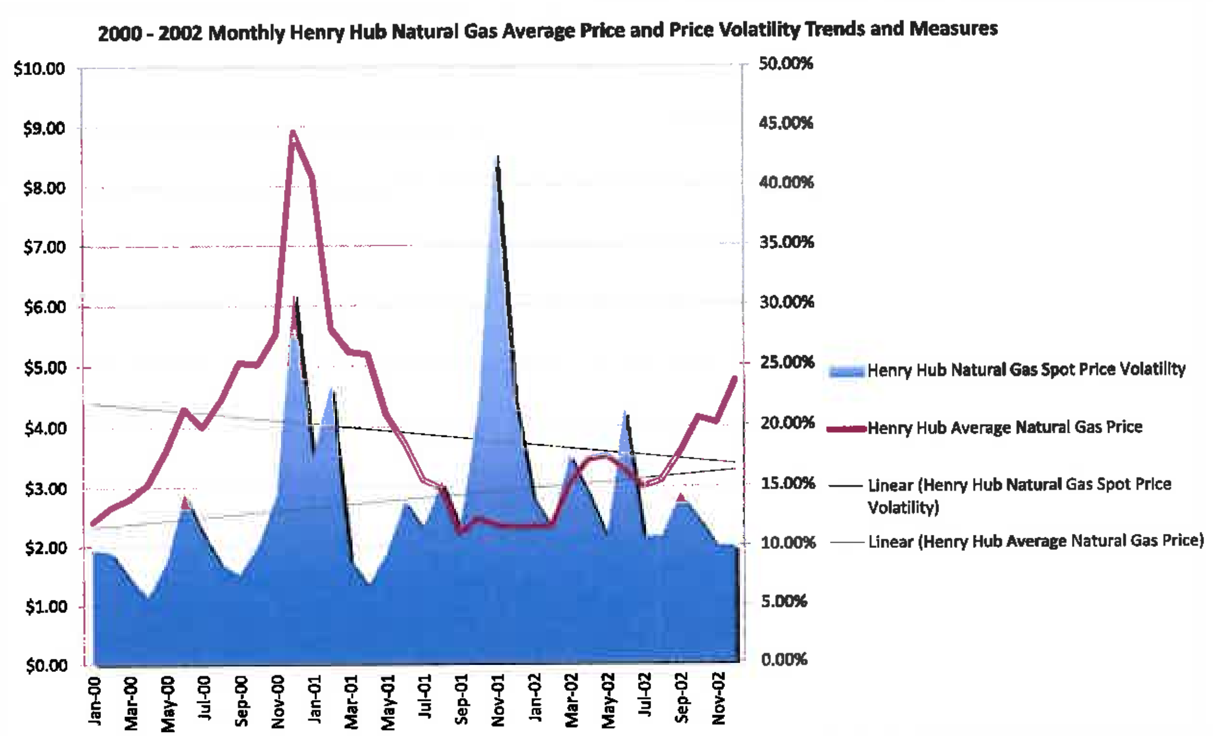


Dates	Price Volatility	Average Price
2000 - 2010	14.240%	$5.70
2011 - 2015	10.219%	$3.60
Change	-28.239%	-36.812%

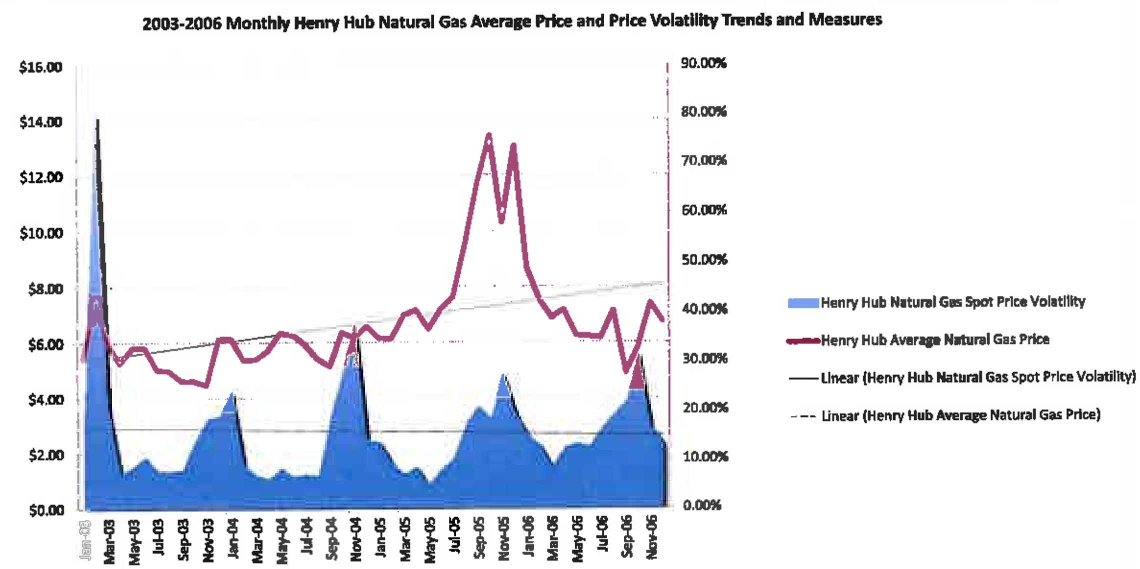
Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Natural Gas Spot Price Average
Jan-97	30.840%	$3.45
Feb-97	18.945%	$2.15
Mar-97	9.325%	$1.89
Apr-97	9.497%	$2.03
May-97	7.344%	$2.25
Jun-97	6.377%	$2.20
Jul-97	5.125%	$2.19
Aug-97	11.322%	$2.49
Sep-97	10.533%	$2.88
Oct-97	10.002%	$3.07
Nov-97	11.655%	$3.01
Dec-97	12.948%	$2.35
Jan-98	7.397%	$2.09
Feb-98	8.876%	$2.23
Mar-98	20.299%	$2.24
Apr-98	22.317%	$2.43
May-98	27.102%	$2.14
Jun-98	36.587%	$2.17
Jul-98	11.904%	$2.17
Aug-98	6.605%	$1.85
Sep-98	9.334%	$2.02
Oct-98	8.977%	$1.91
Nov-98	7.275%	$2.12
Dec-98	5.428%	$1.72
Jan-99	9.516%	$1.85
Feb-99	9.792%	$1.77
Mar-99	9.573%	$1.79
Apr-99	7.443%	$2.15
May-99	5.720%	$2.26
Jun-99	8.622%	$2.30
Jul-99	14.394%	$2.31
Aug-99	11.208%	$2.79
Sep-99	8.554%	$2.55
Oct-99	7.639%	$2.73
Nov-99	10.116%	$2.37
Dec-99	14.229%	$2.36
Avg	12.023%	$2.29
Max	36.587%	$3.45
Min	5.125%	$1.72



Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Average Natural Gas Price
Jan-00	9.79%	$2.42
Feb-00	9.57%	$2.66
Mar-00	7.44%	$2.79
Apr-00	5.72%	$3.04
May-00	8.62%	$3.59
Jun-00	14.39%	$4.29
Jul-00	11.21%	$3.99
Aug-00	8.55%	$4.43
Sep-00	7.64%	$5.06
Oct-00	10.12%	$5.02
Nov-00	14.23%	$5.52
Dec-00	31.23%	$8.90
Jan-01	17.52%	$8.17
Feb-01	23.35%	$5.61
Mar-01	8.91%	$5.23
Apr-01	6.69%	$5.19
May-01	9.44%	$4.19
Jun-01	13.80%	$3.72
Jul-01	11.59%	$3.11
Aug-01	15.39%	$2.97
Sep-01	11.59%	$2.19
Oct-01	21.40%	$2.46
Nov-01	43.22%	$2.34
Dec-01	22.42%	$2.30
Jan-02	14.04%	$2.32
Feb-02	11.61%	$2.32
Mar-02	17.59%	$3.03
Apr-02	14.41%	$3.43
May-02	10.79%	$3.50
Jun-02	21.31%	$3.26
Jul-02	10.75%	$2.99
Aug-02	10.87%	$3.09
Sep-02	14.33%	$3.55
Oct-02	12.31%	$4.13
Nov-02	10.04%	$4.04
Dec-02	9.96%	$4.74
Avg	13.94%	$3.88
Max	43.22%	$8.90
Min	5.72%	$2.19

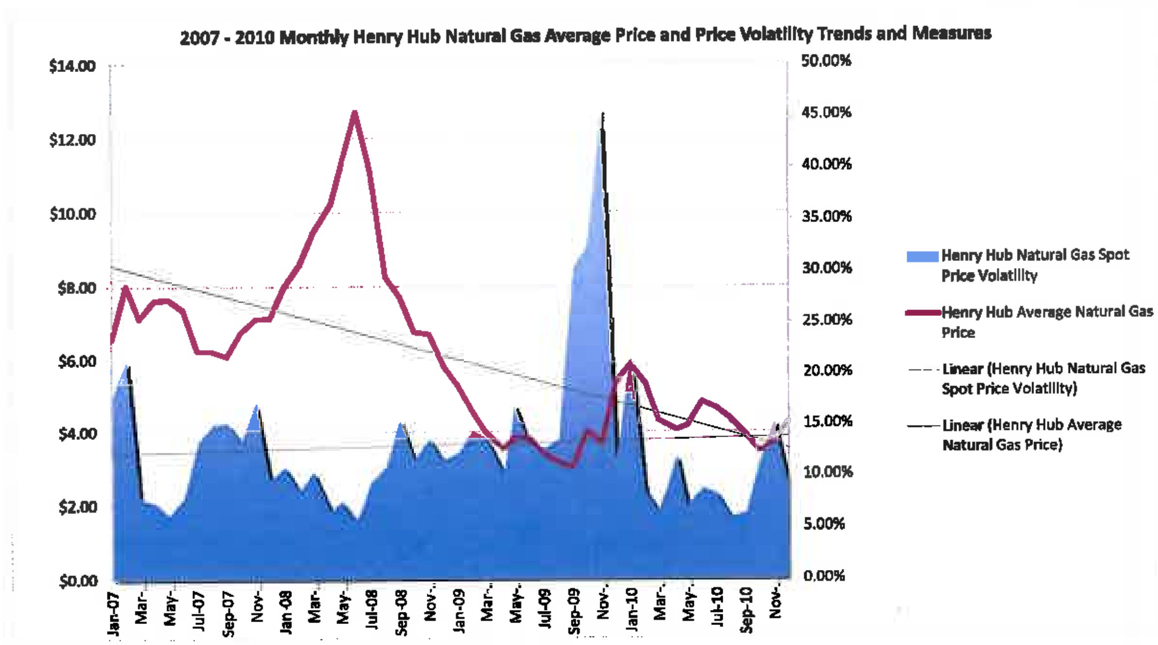


Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Average Natural Gas Price
Jan-03	17.08%	$5.43
Feb-03	81.52%	$7.71
Mar-03	20.93%	$5.93
Apr-03	7.29%	$5.26
May-03	8.78%	$5.81
Jun-03	10.68%	$5.82
Jul-03	7.96%	$5.03
Aug-03	7.79%	$4.98
Sep-03	8.18%	$4.62
Oct-03	13.87%	$4.63
Nov-03	18.50%	$4.47
Dec-03	18.90%	$6.13
Jan-04	24.00%	$6.14
Feb-04	9.07%	$5.37
Mar-04	6.97%	$5.39
Apr-04	6.09%	$5.71
May-04	8.47%	$6.33
Jun-04	6.75%	$6.27
Jul-04	7.18%	$5.93
Aug-04	6.82%	$5.41
Sep-04	18.77%	$5.15
Oct-04	28.02%	$6.35
Nov-04	37.40%	$6.17
Dec-04	14.05%	$6.58
Jan-05	13.71%	$6.15
Feb-05	9.36%	$6.14
Mar-05	7.15%	$6.96
Apr-05	8.60%	$7.16
May-05	4.98%	$6.47
Jun-05	8.01%	$7.18
Jul-05	10.28%	$7.63
Aug-05	17.46%	$9.53
Sep-05	20.91%	$11.75
Oct-05	18.50%	$13.42
Nov-05	27.45%	$10.30
Dec-05	19.52%	$13.05
Jan-06	15.22%	$8.69
Feb-06	12.91%	$7.54
Mar-06	8.58%	$6.89
Apr-06	12.60%	$7.16
May-06	13.32%	$6.25
Jun-06	12.76%	$6.21
Jul-06	16.47%	$6.17
Aug-06	19.31%	$7.14
Sep-06	21.95%	$4.90
Oct-06	31.54%	$5.85
Nov-06	16.68%	$7.40
Dec-06	13.39%	$6.73
Avg	15.74%	$6.73
Max	81.52%	$13.42
Min	4.98%	$4.47

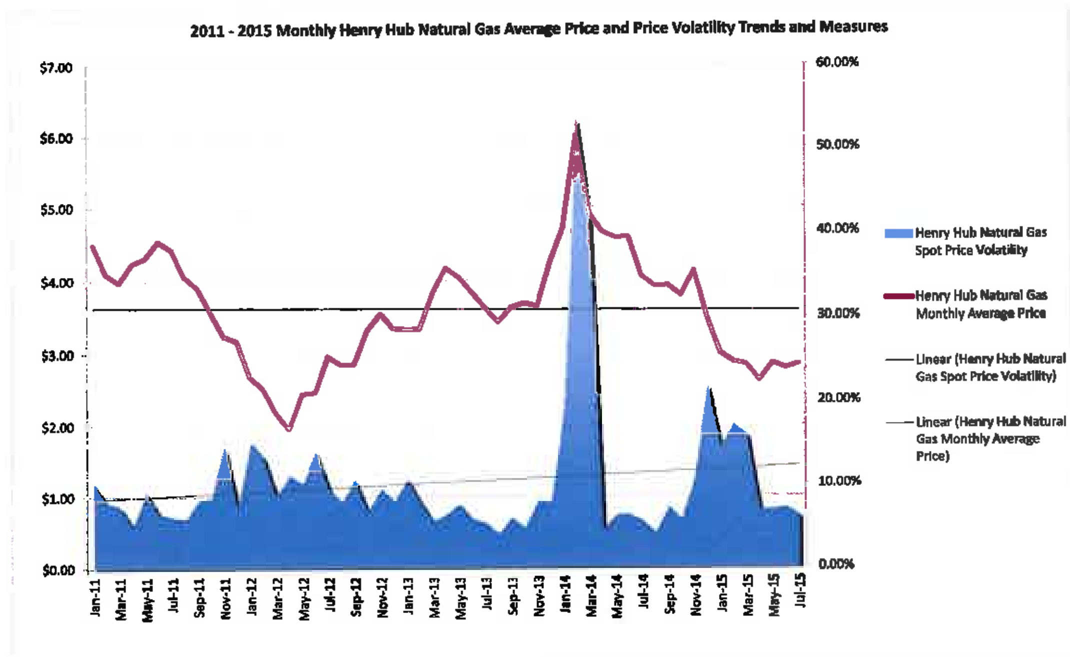


Docket No. 160001-EI
Exhibit DJL-2
Testimony & Exhibits of Daniel J. Lawton
filed in Docket No. 150001-EI
Page 70 of 73

Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Average Natural Gas Price
Jan-07	17.95%	$6.55
Feb-07	21.34%	$8.00
Mar-07	7.88%	$7.11
Apr-07	7.41%	$7.60
May-07	6.29%	$7.64
Jun-07	7.90%	$7.35
Jul-07	13.35%	$6.22
Aug-07	15.05%	$6.22
Sep-07	15.27%	$6.08
Oct-07	13.49%	$6.74
Nov-07	17.10%	$7.10
Dec-07	9.67%	$7.10
Jan-08	10.89%	$7.99
Feb-08	8.55%	$8.54
Mar-08	10.43%	$9.41
Apr-08	6.65%	$10.18
May-08	7.56%	$11.27
Jun-08	5.67%	$12.69
Jul-08	9.38%	$11.09
Aug-08	10.88%	$8.26
Sep-08	15.42%	$7.67
Oct-08	11.61%	$6.74
Nov-08	13.66%	$6.68
Dec-08	11.53%	$5.82
Jan-09	12.24%	$5.24
Feb-09	14.37%	$4.51
Mar-09	13.72%	$3.96
Apr-09	10.30%	$3.49
May-09	16.85%	$3.83
Jun-09	13.13%	$3.80
Jul-09	12.63%	$3.38
Aug-09	13.49%	$3.14
Sep-09	30.25%	$2.99
Oct-09	32.48%	$4.01
Nov-09	45.51%	$3.66
Dec-09	11.57%	$5.35
Jan-10	21.67%	$5.83
Feb-10	8.49%	$5.32
Mar-10	6.54%	$4.29
Apr-10	11.90%	$4.03
May-10	7.08%	$4.14
Jun-10	8.72%	$4.80
Jul-10	8.27%	$4.63
Aug-10	6.06%	$4.32
Sep-10	6.34%	$3.89
Oct-10	11.44%	$3.43
Nov-10	15.16%	$3.71
Dec-10	8.97%	$4.25
Avg	12.96%	$6.04
Max	45.51%	$12.69
Min	5.67%	$2.99



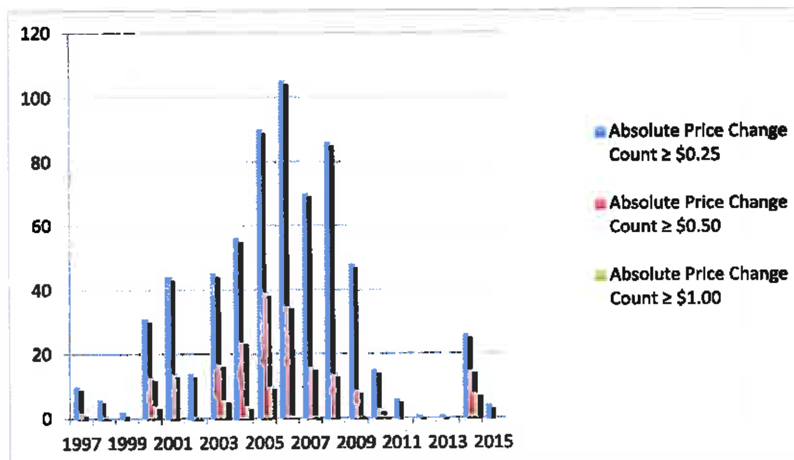
Date	Henry Hub Natural Gas Spot Price Volatility	Henry Hub Natural Gas Monthly Average Price
Jan-11	10.15%	$4.49
Feb-11	7.92%	$4.09
Mar-11	7.48%	$3.97
Apr-11	5.19%	$4.24
May-11	9.10%	$4.31
Jun-11	6.61%	$4.54
Jul-11	6.14%	$4.42
Aug-11	5.89%	$4.05
Sep-11	8.20%	$3.90
Oct-11	8.39%	$3.57
Nov-11	14.56%	$3.24
Dec-11	7.13%	$3.17
Jan-12	15.20%	$2.67
Feb-12	13.25%	$2.50
Mar-12	8.67%	$2.17
Apr-12	11.19%	$1.95
May-12	10.07%	$2.43
Jun-12	13.91%	$2.46
Jul-12	9.51%	$2.95
Aug-12	7.88%	$2.84
Sep-12	10.50%	$2.85
Oct-12	6.71%	$3.32
Nov-12	9.59%	$3.54
Dec-12	7.92%	$3.34
Jan-13	10.64%	$3.33
Feb-13	7.94%	$3.33
Mar-13	5.53%	$3.81
Apr-13	6.40%	$4.17
May-13	7.61%	$4.04
Jun-13	5.76%	$3.83
Jul-13	5.40%	$3.62
Aug-13	4.00%	$3.43
Sep-13	5.98%	$3.62
Oct-13	4.72%	$3.68
Nov-13	8.01%	$3.64
Dec-13	7.79%	$4.24
Jan-14	19.02%	$4.71
Feb-14	53.57%	$6.00
Mar-14	41.33%	$4.90
Apr-14	4.51%	$4.66
May-14	6.30%	$4.58
Jun-14	6.34%	$4.59
Jul-14	5.57%	$4.05
Aug-14	4.12%	$3.91
Sep-14	7.23%	$3.92
Oct-14	5.76%	$3.78
Nov-14	10.81%	$4.12
Dec-14	21.69%	$3.48
Jan-15	14.52%	$2.99
Feb-15	17.17%	$2.87
Mar-15	15.91%	$2.83
Apr-15	6.85%	$2.61
May-15	6.97%	$2.85
Jun-15	7.16%	$2.78
Jul-15	6.26%	$2.84
Avg	10.22%	$3.60
Max	53.57%	$6.00
Min	4.00%	$1.95



Docket No. 160001-EI
Exhibit DJL-2
Testimony & Exhibits of Daniel J. Lawton
filed in Docket No. 150001-EI
Page 72 of 73

Analysis of Absolute Value of Price Changes at the Henry Hub 1997 - 2015

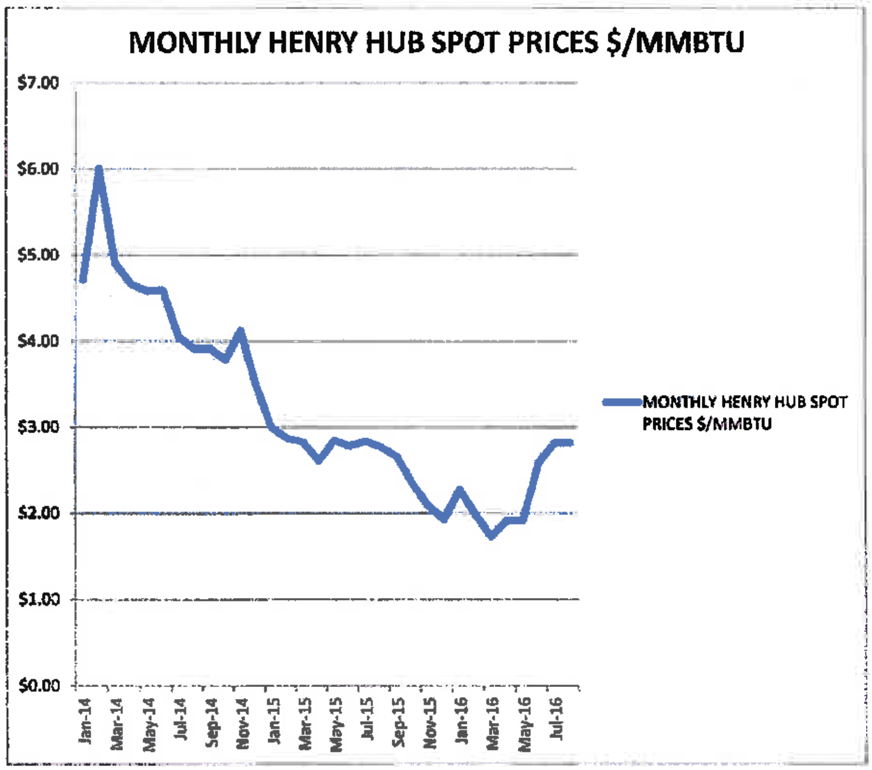
YEAR	Henry Hub Natural Gas Spot Price Average	Absolute Price Change Average	YEAR	Absolute Price Change Count ≥ $0.25	Absolute Price Change Count ≥ $0.50	Absolute Price Change Count ≥ $1.00
1997	$2.48	$0.07	1997	10	2	0
1998	$2.09	$0.06	1998	6	1	0
1999	$2.27	$0.05	1999	2	0	0
2000	$4.31	$0.14	2000	31	13	4
2001	$3.96	$0.14	2001	44	14	0
2002	$3.38	$0.10	2002	14	1	0
2003	$5.47	$0.26	2003	45	17	6
2004	$5.89	$0.19	2004	56	24	4
2005	$8.69	$0.29	2005	90	39	10
2006	$6.73	$0.26	2006	105	35	1
2007	$6.97	$0.20	2007	70	16	1
2008	$8.86	$0.20	2008	86	14	0
2009	$3.94	$0.16	2009	48	9	1
2010	$4.37	$0.10	2010	15	3	1
2011	$4.00	$0.07	2011	6	0	0
2012	$2.75	$0.07	2012	1	0	0
2013	$3.73	$0.06	2013	1	0	0
2014	$4.37	$0.15	2014	26	15	8
2015	$2.82	$0.06	2015	4	0	0



Docket No. 160001-EI
Exhibit DJL-2
Testimony & Exhibits of Daniel J. Lawton
filed in Docket No. 150001-EI
Page 73 of 73

MONTHLY SPOT HENRY HUB NATURAL GAS PRICES JANUARY 2014 - AUGUST 2016 ($/MMBTU)

LINE NO.	DATE	MONTHLY HENRY HUB SPOT PRICES $/MMBTU
1	Jan-14	$4.71
2	Feb-14	$6.00
3	Mar-14	$4.90
4	Apr-14	$4.66
5	May-14	$4.58
6	Jun-14	$4.59
7	Jul-14	$4.05
8	Aug-14	$3.91
9	Sep-14	$3.92
10	Oct-14	$3.78
11	Nov-14	$4.12
12	Dec-14	$3.48
13	Jan-15	$2.99
14	Feb-15	$2.87
15	Mar-15	$2.83
16	Apr-15	$2.61
17	May-15	$2.85
18	Jun-15	$2.78
19	Jul-15	$2.84
20	Aug-15	$2.77
21	Sep-15	$2.66
22	Oct-15	$2.34
23	Nov-15	$2.09
24	Dec-15	$1.93
25	Jan-16	$2.28
26	Feb-16	$1.99
27	Mar-16	$1.73
28	Apr-16	$1.92
29	May-16	$1.92
30	Jun-16	$2.59
31	Jul-16	$2.82
32	Aug-16	$2.82
33		
34	Avg 2014	$4.39
35	Avg 2015	$2.63
36	Avg 2016	$2.26
37	Avg Last 12 Mos	$2.26



FLORIDA UTILITY HEDGING GAINS & LOSSES SUMMARY (2002 TO 2016)*

Totals Gains/Losses By Year

Year	Duke	FPL	Gulf	TECO	TOTALS FOR THE FOUR IOUs 2002-2016
2002	$ (2,098,791)	$ 14,520,306	$ 238,750	$ (203,500)	$ 12,456,765
2003	$ 19,772,126	$ (15,939,810)	$ 4,862,077	$ (2,758,028)	$ 5,936,365
2004	$ 51,068,145	$ 191,564,536	$ 6,652,157	$ 8,413,170	$ 257,698,008
2005	$ 121,672,401	$ 519,388,788	$ 22,571,976	$ 53,231,770	$ 716,864,935
2006	$ 62,066,818	$ (416,637,197)	$ (18,714,562)	$ (54,482,120)	$ (427,767,061)
2007	$ (34,399,955)	$ (799,268,428)	$ (9,197,433)	$ (59,691,520)	$ (902,557,336)
2008	$ 116,935,706	$ 100,709,736	$ (1,737,726)	$ 18,147,375	$ 234,055,091
2009	$ (556,149,474)	$ (1,660,695,829)	$ (51,232,251)	$ (193,185,985)	$ (2,461,263,539)
2010	$ (285,863,553)	$ (509,147,046)	$ (19,667,161)	$ (67,840,710)	$ (882,518,470)
2011	$ (240,882,264)	$ (404,239,340)	$ (15,444,523)	$ (33,889,480)	$ (694,455,607)
2012	$ (351,321,610)	$ (671,819,795)	$ (32,865,554)	$ (61,518,120)	$ (1,117,525,079)
2013	$ (140,907,108)	$ 18,253,045	$ (14,654,866)	$ (3,256,370)	$ (140,565,299)
2014	$ (27,741,075)	$ 116,639,265	$ 1,910,889	$ 15,615,785	$ 106,424,864
2015	$ (225,543,645)	$ (504,393,229)	$ (50,572,362)	$ (39,842,325)	$ (820,351,561)
2016 (Jan. 1-July 31 Actuals)	$ (114,900,000)	$ (190,763,980)	$ (37,505,696)	$ (17,877,735)	$ (361,047,411)
Total Gains/(Losses) Actuals	**$ (1,608,292,279)**	**$ (4,211,828,978)**	**$ (215,356,285)**	**$ (439,137,793)**	**$ (6,474,615,335)**
2016 (Aug. 1-Dec. 31 Projected)	$ (30,600,000)	$ (34,625,394)	$ (17,063,422)	$ (583,030)	$ (82,871,846)
Total Gains/(Losses) w/ 2016 Projections	**$ (1,638,892,279)**	**$ (4,246,454,372)**	**$ (232,419,707)**	**$ (439,720,823)**	**$ (6,557,487,181)**

*As of September 7, 2016, based on IOUs' responses to OPC discovery.

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

DOCKET NO. 160021-EI

PETITION FOR RATE INCREASE BY FLORIDA POWER & LIGHT COMPANY.
_______________________________/

DOCKET NO. 160061-EI

PETITION FOR APPROVAL OF 2016-2018 STORM HARDENING PLAN BY FLORIDA POWER & LIGHT COMPANY.
_______________________________/

DOCKET NO. 160062-EI

2016 DEPRECIATION AND DISMANTLEMENT STUDY BY FLORIDA POWER & LIGHT COMPANY.
_______________________________/

DOCKET NO. 160088-EI

PETITION FOR LIMITED PROCEEDING TO MODIFY AND CONTINUE INCENTIVE MECHANISM, BY FLORIDA POWER & LIGHT COMPANY.
_______________________________/

TELEPHONIC DEPOSITION OF:	MORAY DEWHURST
TAKEN AT THE INSTANCE OF:	The Staff of the Florida Public Service Commission
PLACE:	Room 382D Gerald L. Gunter Building 2540 Shumard Oak Boulevard Tallahassee, Florida
TIME:	Commenced at 2:00 p.m. Concluded at 6:06 p.m.
DATE:	Thursday, August 4, 2016
REPORTED BY:	ANDREA KOMARIDIS Court Reporter and Notary Public in and for the State of Florida at Large

Does FPL need a strong balance sheet to support its natural gas hedging?

A It depends. It depends, obviously, on the extent of the hedging program, but certainly that is an application of financial strength that, at various times, has benefited from the support of the balance sheet.

The balance sheet is a general resource that has, you know, multiple ways in which it can be applied. But certainly, the fuel-hedging program is one of them, but -- as is the basic fuel-purchasing program.

Q Okay. How would reducing FPL's equity ratio from 59.6 percent of investor capital to 50 percent affect FPL's ability to hedge natural gas?

A It's hard to put numbers around that. I would say it would dramatically diminish our ability to support either the hedging program or a variety of other needs.

A move from 59.6 to 50 percent would have major negative consequences in a variety of areas, but one of them would be that we would no longer have -- well, over time, we would no longer have access to the same level of liquidity and, therefore, we wouldn't be able to respond to the kinds of short-term, unexpected events that we do now.

Q And in terms of natural gas, an unexpected event might be a supply interruption and increased natural gas price in the short-term?

A Yes, those would be two major ones. To the extent that, if we are unhedged, hypothetically, and we have a significant increase in gas prices, then, obviously, we're going to have an under-recovery through the fuel clause.

We have to have the financial flexibility to be able to go out and buy the fuel, convince the suppliers that we're going to pay for it. If we don't have the balance sheet, we would not be able to do that. So, that's a fuel- -- fuel-price element. And there is certainly a fuel-supply-interruption element.

Q And I want to make sure I understand what you just told me. My understanding is that FP&L is allowed to recover its fuel costs through the fuel clause, and that those costs are trued up on an annual basis; is that right?

A That's correct; although, the true-up may be from an accrual perspective on an annual basis. The recovery of the cash may well -- and certainly in the past, has extended over more than one year.

In either case, however, we have to have the cash to be able to go and buy the fuel for the benefit of our customers. And so, the liquidity need comes in there.

So, there's a distinction between ultimate recovery of prudently-incurred costs and the need to be able to fund what can be pretty large swings in cash flow. It's swings in cash flow that require the balance sheet and liquidity support.

Q And so, basically, you're talking about being able to bridge the time in which there is a regulatory lag between having to spend the money and being able to recover it.

A Yes, but I think it's more than that because it's -- had it been able to do that and then still be in a position to continue to do all the other aspects of running the business and delivering value to customers without that changing.

So, just by way of example, in my past experience in the consulting business, I've seen plenty of examples of companies that start to get squeezed on liquidity. And one of the consequences in response to that is that they are forced to make changes on the operational side of the business which are detrimental. We want to avoid that.

Q Got it.

If the Commission were to reduce FP&L's equity

Corrected Response - Interrogatory Nos. 127 and 128 - OPC's 12th Set of Interrogatories

Final True-Up Filing Data Year	Jurisdictional Total Fuel Costs & Net Power Transactions	Jurisdictional Fuel Revenues Applicable to Period	Cumulative Monthly True-up Amount - Over/(Under) Recovery	Percent Variance	Hedging Savings/(Costs)	Revised Jurisdictional Total Fuel Costs & Net Power Transactions	Jurisdictional Fuel Revenues Applicable to Period	Cumulative Monthly True-up Amount - Over/(Under) Recovery	Percent Variance
2002	$2,459,001,016	$2,377,739,316	($81,261,700)	-3.42%	$46,994,088	$2,505,995,103	$2,377,739,316	($128,255,788)	-5.39%
2003	$3,444,197,949	$3,144,836,744	($299,361,205)	-9.52%	$15,701,704	$3,459,899,653	$3,144,836,744	($315,062,909)	-10.02%
2004	$3,484,396,810	$3,296,934,142	($187,462,668)	-5.69%	$251,922,139	$3,736,318,949	$3,296,934,142	($439,384,807)	-13.33%
2005	$4,906,808,719	$3,879,452,165	($1,027,356,554)	-26.48%	$625,001,024	$5,531,809,743	$3,879,452,165	($1,652,357,578)	-42.59%
2006	$5,427,041,074	$5,620,725,235	$193,684,161	3.45%	($468,638,337)	$4,958,402,737	$5,620,725,235	$662,322,498	11.78%
2007	$6,016,453,717	$5,874,686,707	($141,767,010)	-2.41%	($855,797,821)	$5,160,655,896	$5,874,686,707	$714,030,811	12.15%
2008	$6,084,621,247	$5,839,073,540	($245,547,707)	-4.21%	$368,264,441	$6,452,885,688	$5,839,073,540	($613,812,148)	-10.51%
2009	$5,253,110,989	$5,688,508,594	$435,397,605	7.65%	($1,723,597,065)	$3,529,513,924	$5,688,508,594	$2,158,994,670	37.95%
2010	$4,576,587,132	$4,323,584,596	($253,002,536)	-5.85%	($500,229,888)	$4,076,357,244	$4,323,584,596	$247,227,352	5.72%
2011	$4,136,187,692	$4,079,099,228	($57,088,464)	-1.40%	($387,658,446)	$3,748,529,246	$4,079,099,228	$330,569,982	8.10%
2012	$3,571,615,003	$3,666,288,610	$94,673,607	2.58%	($669,142,129)	$2,902,472,874	$3,666,288,610	$763,815,736	20.83%
2013	$3,236,315,354	$3,093,026,968	($143,288,386)	-4.63%	$17,542,395	$3,253,857,749	$3,093,026,968	($160,830,781)	-5.20%
2014	$3,504,345,523	$3,248,028,140	($256,317,383)	-7.89%	$116,639,265	$3,620,984,788	$3,248,028,140	($372,956,648)	-11.48%

Note: This corrected table answers both Interrogatories

Entergy Texas, Inc.
Proposed Fuel Factor
Sep-16

Sep-16

Line No.			
1	Actual FF Expense (8/15 through 7/16)	$	466,261,533
2	Less: Coal and Nuclear FF Expense	$	46,454,707
3	Adjusted FF Expense w/o Coal and Nuclear	$	419,806,826
4	Multiplied by: Projected Market Factor		137.6%
5	September 2015 Fuel Factor Expense	$	577,654,193
6	Add: Coal and Nuclear FF Expense	$	46,454,707
7	September 2015 Fuel Factor Expense	$	624,108,900
8	Divided by: Actual FF Sales (8/15 through 7/16)		17,937,371,449
9	Average Fuel Factor Rate ($/MWH)	$	34.7938

Projected Market Factor:

Simple Average (Henry Hub Price 9/16 through 8/17)	$	3.06	
Simple Average (Henry Hub Price 8/15 through 7/16)	$	2.22	
			137.6%

(A) Voltage Level	(B) Loss Multiplier	(C) Line 9*Column B Voltage Level Factor
Secondary	1.026844	35.7278
Primary	1.000116	34.7978
69kV and 138 kV	0.962408	33.4858
230kV	0.947964	32.9832

Note: The loss multipliers are those developed by a line loss study for the annual period ended December 31, 2014, consistent with Docket No. 40654

Entergy Texas, Inc.
Fixed Fuel Factor Sales at Meter
August 2015 - July 2016

EGSI-TX
FFF Sales at Meter

Month	kWh Sales	Annual FF Sales
Aug-15	1,822,561,064	
Sep-15	1,719,372,815	
Oct-15	1,499,496,170	
Nov-15	1,376,127,761	
Dec-15	1,313,225,358	
Jan-16	1,519,458,664	
Feb-16	1,370,860,771	
Mar-16	1,278,438,570	
Apr-16	1,287,373,222	
May-16	1,399,616,127	
Jun-16	1,597,370,973	
Jul-16	1,753,469,954	17,937,371,449

Attachment B
Page 1 of 2

Entergy Gulf States, Inc.
Henry Hub Settlement Prices
Per Wall Street Journal

Publish Date	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Average
1-Aug	2.876	2.917	3.078	3.320	3.436	3.418	3.360	3 070	3.038	3.068	3.095	3.104	3.148
2-Aug	2 771	2.818	2.960	3.239	3.357	3.344	3.295	3.030	3.002	3.034	3.063	3.073	3.084
3-Aug	2.733	2.783	2.943	3.199	3.316	3.304	3.259	3.020	2.998	3.033	3.064	3.074	3.060
4-Aug	2.839	2.881	3.034	3.276	3.382	3.378	3.328	3.072	3.043	3.074	3.109	3.111	3.128
5-Aug	2 834	2.877	3.022	3.267	3.385	3.372	3.324	3.066	3.040	3.072	3.102	3.111	3.123
8-Aug	2.772	2.809	2.985	3.217	3.338	3.328	3.283	3.038	3.011	3.045	3.078	3.086	3.081
9-Aug	2.748	2.779	2.943	3.191	3.317	3.309	3.266	3.029	3.003	3.035	3.065	3.075	3.063
10-Aug	2.615	2.659	2.844	3.098	3.232	3.226	3.186	2.984	2.941	2.975	3.006	3.016	2.980
11-Aug	2.581	2.616	2.801	3.059	3.197	3.192	3.164	2 940	2.918	2.952	2.963	2.993	2.947
12-Aug	2 551	2.607	2.792	3.051	3.190	3.185	3.147	2.931	2.909	2.948	2 978	2 985	2.939
Average	2.730	2.775	2.940	3.192	3.316	3.306	3.260	3.016	2.990	3.023	3.053	3.063	3.056