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Witness: Wm. Edward Blunk
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2014-0370

DIRECT TESTIMONY

OF

WM. EDWARD BLUNK

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

Kansas City, Missouri
October 2014

"[redacted]**" Designates "Highly Confidential" Information Has Been Removed.**
Certain Schedules Attached To This Testimony Designated "Highly Confidential" Have Been Removed Pursuant To 4 CSR 240-2.135.

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DIRECT TESTIMONY

OF

WM. EDWARD BLUNK

Case No. ER-2014-0370

Q: Please state your name and business address.

A: My name is Wm. Edward Blunk. My business address is 1200 Main Street, Kansas City, Missouri 64105.

Q: By whom and in what capacity are you employed?

A: I am employed by Kansas City Power & Light Company ("KCP&L" or "Company") as Generation Planning Manager.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of KCP&L.

Q: What are your responsibilities?

A: My primary responsibilities are to facilitate the development and implementation of fuel or energy market risk management strategies.

Q: Please describe your education, experience and employment history.

A: In 1978, I was awarded the degree of Bachelor of Science in Agriculture *cum laude* by the University of Missouri at Columbia, where I was an Honors Scholar in Agricultural Economics. In 1980, I was awarded the Master of Business Administration degree by the University of Missouri at Columbia. Since then I have completed additional graduate coursework in forecasting theory and applications at the University of Missouri in Kansas City.

Before graduating from the University of Missouri, I joined the John Deere Company from 1977 through 1981 and performed various marketing, marketing research, and dealer management tasks. In 1981, I joined KCP&L as Transportation/Special Projects Analyst. My responsibilities included fuel price forecasting, fuel planning and other analyses relevant to negotiation and/or litigation with railroads and coal companies. I was promoted to the position of Supervisor, Fuel Planning in 1984. In 2007, my position was upgraded to Manager, Fuel Planning. In 2009 my position was changed to Supply Planning Manager. In 2013, it was changed to Generation Planning Manager. While in these positions I have been responsible for developing risk management and hedging programs. Earlier this year the Global Association of Risk Professionals certified me as an Energy Risk Professional.

Q: Have you previously testified in a proceeding at the Missouri Public Service Commission ("MPSC" or "Commission") or before any other utility regulatory agency?

A: I have previously testified before both the MPSC and the Kansas Corporation Commission in multiple cases on multiple issues including fuel prices, forecast prices for fuel and emission allowances, strategies for managing fuel price risk, hedging, fuel-related costs, fuel inventory, and the management of emission allowances.

Q: On what subjects will you be testifying?

A: I will be testifying on fuel related issues. My testimony serves three purposes. First I am supporting the fuel prices, emission prices, and certain fuel and emission related costs, including fuel inventory, used to develop the Company's Cost of Service ("COS") calculations. Second, I will address certain fuel and emission allowance related issues as required when a company seeks a fuel adjustment clause ("FAC"). Finally, I will discuss the fuel and emission price assumptions included in the analyses that led to the decision to retro-fit La Cygne Generating Station ("La Cygne") with environmental control equipment.

I. FUEL IN COST OF SERVICE

Q: What is the purpose of this portion of your testimony?

A: The purpose of this part of my testimony is to explain how prices for fuel and fuel-related commodities were forecast to project fuel expense for the COS that will be trued-up.

A. Fuel Price Forecast

Q: What fuel prices did KCP&L use to develop its COS?

A: KCP&L used coal and oil prices projected for April 2015. We used actual natural gas prices for May through September 2014 and projected prices, as described below, for October 2014 through April 2015. Please refer to the Direct Testimony of Company witnesses Ronald A. Klote and Darrin R. Ives regarding the test year and expected true-up period.

Q: Will these projected prices be replaced with actual prices in the May 2015 true-up?

A: Yes. We expect to replace the projected prices with actual prices in the May 2015 true-up.

Q: How did you forecast the natural gas prices used to develop the Company's COS?

A: Natural gas prices for the 12 months from May 2014 through April 2015 were used to develop the cost of natural gas in the COS. Natural gas prices for May 2014 through September 2014 were based on the NYMEX contract settlement prices for the specific contract months. Monthly natural gas prices for October 2014 through April 2015 were based on the August 26 through September 2, 2014 average NYMEX daily settlement prices for the October 2014 through April 2015 Henry Hub natural gas futures contracts. These monthly Henry Hub prices were then adjusted using the three-year average basis from 2011 through 2013 for each month. These basis-adjusted values were used to develop the cost of natural gas in the COS. Again, we expect to true-up the natural gas prices during the course of this proceeding.

Q: How did you forecast the oil prices?

A: Oil prices are handled differently than natural gas because KCP&L uses oil differently. Oil is used primarily for flame stability and start-up at our Iatan, La Cygne, and Montrose coal units. The price of oil used for flame stability and start-up was based on the April 2015 heating oil futures contract. Like natural gas, we used the August 26 through September 2, 2014 average NYMEX daily settlement prices. Consistent with past cases, KCP&L's oil-fired Northeast Power Station units were assumed to be dispatched using replacement fuel prices like those used for flame stability and start-up; however, fuel expense was adjusted to use Northeast Power Station's projected month-end inventory value at April 2015. We expect to true-up oil prices during the course of this proceeding.

Q: How did you forecast the coal prices?

A: The April 2015 delivered prices of Powder River Basin ("PRB") coal were forecast as the sum of the mine price and the transportation rate. Most of the coal contracts under which KCP&L expects to purchase PRB coal in 2015 specify a fixed mine price that is only subject to adjustment for quality or government imposition such as changes in laws, regulations, or taxes. Those contracts that are not fixed either specify a base price and allow for an adjustment for some form of inflation or construct their price from a market index. For those contracts that construct their price from a market index, and for expected coal purchases not under contract, we used the August 26 through September 2, 2014 average of NYMEX ClearPort daily settlement prices to project the April 2015 price.

The bituminous coal used in La Cygne Unit 1 is purchased on a delivered basis from regional mines. The April 2015 delivered price for KCP&L's bituminous coal was forecast as equal to the 2015 contract price.

We expect to true-up all coal prices and freight rates during the course of this proceeding.

Q: How did you develop projections of the freight rates for moving PRB coal?

A: We developed the freight rate projections based on the contractually defined escalation mechanisms. Where those contracts called for an index, we constructed the forecasted index from data forecast by Moody's Analytics.

B. Fuel Additives and Fuel Adders

Q: Are there costs related to fuel and included in adjustment CS-24 that are not included in the price of fuel?

A: Yes. Generally those costs fall into two categories: "fuel additives" and "fuel adders." Fuel additives include ammonia, lime, limestone, powder activated carbon ("PAC"), and urea which are used to control emissions and molten sulfur or other additives that reduce fly ash resistivity for lower sulfur coals and improve the collection efficiency of electrostatic precipitators. The fuel adders include unit train lease expense, unit train maintenance, unit train property tax, unit train depreciation, coal dust mitigation, freeze protection, natural gas hedging costs, and costs associated with transporting natural gas. We expect to true-up these prices to actual during the course of this proceeding.

Q: Why does KCP&L need fuel additives?

A: Fuel additives, which include pollution control reagents, are commodities that are consumed in addition to the fuel either through combustion or chemical reaction. For example, ammonia is added to a stream of flue gas where it reacts with nitrogen oxide ("NO_x") as the gases pass through a catalyst chamber. Lime (or limestone) is added to the flue gas stream in a flue gas desulfurization module to "scrub" sulfur dioxide ("SO_2"). Some units also use PAC as a sorbent for controlling mercury emissions. Montrose uses a flue gas conditioning agent to improve the performance of its electrostatic precipitators.

Q: How did you determine the cost of the fuel additives?

A: The cost was determined as the quantity times the price, where the price was the value projected for the April 2015 true-up and the quantity was based on projected usage rates. We expect to true-up these costs and usage rates during the course of this proceeding.

Q: How did you determine the cost of the fuel adders?

A: I will address each of the fuel adders in turn, but generally the cost of the various fuel adders were based on a projection of their annual expense.

Q: Please describe the unit train-related expenses.

A: Unit-train related expenses included in adjustment CS-24 are as follows:

- Unit train lease expense which is separated into two components:
- Long-term unit train lease expense; and
- Short-term unit train lease expense.

- Unit train maintenance expense consisting of:
- Foreign car repair;
- Shared expenses; and
- Maintenance and repair of KCP&L's railcar fleet.

Long-Term Unit Train Lease Expense: The amount presented here for unit train lease expense reflects KCP&L's share of the long-term lease payments that will be made for unit trains that will be in service in 2015.

Short-Term Unit Train Lease Expense: Short-term unit train lease expense is our estimate of railcar capacity that will be acquired through the short-term railcar lease market to move KCP&L's coal requirements.

Foreign Car Repair: This represents the cost of repairing railcars that are running in service for KCP&L but are not owned by or under a long-term lease to KCP&L.

Shared Expenses: These are costs for items like Association of American Railroads publications, Universal Machine Language Equipment Register fees, and railcar management software fees that cannot be assigned to an individual car but are "shared" or distributed across the fleet.

Maintenance and Repair of KCP&L's Railcar Fleet: These repair values reflect KCP&L's projections given the age and makeup of the railcar fleet.

Q: Are there unit train-related expenses that are not included in adjustment CS-24?

A: Yes, unit-train related expenses for ad valorem private car line taxes and railcar depreciation are not included in adjustment CS-24. Ad valorem private car line taxes are included in adjustment CS-126. Depreciation for railcars is included in adjustment CS-

120. These adjustments are included in Company witness Ronald Klote's Schedule RAK-4.

Q: Are there unit train-related expenses that are not equipment related?

A: Yes. In July 2011 the Burlington Northern Santa Fe Railway ("BNSF") issued a new tariff intended to limit the amount of coal dust that blows off of rail cars during transit. Those rules set limits on the volume of coal dust that may come off a coal train over certain units of track and provide options for how to achieve those limits. One of those options is to apply chemical topper agents. We estimate that the cost of spraying rail cars with chemical topper agents in an effort to limit the volume of coal dust coming off coal trains to cost **[redacted]** of coal shipped. We may need to include that cost at true-up should less expensive methods currently employed not prove sufficiently effective.

Another unit train-related expense that is not equipment related is freeze protection. In anticipation of and during cold weather we may use side release agents or freeze conditioning agents to prevent coal from freezing to railcar interiors. When coal freezes to the interior of a railcar it won't unload and becomes "carry back". Carry back represents a loss in railcar efficiency, slows down unloading times and can increase the likelihood of a derailment due to improper weight distribution within a train.

Q: How did you determine the natural gas hedging costs?

A: The Company's projected natural gas requirements for 2014 and 2015 are below our threshold for hedging, so we included $0 in the projected true-up values.

Q: Will KCP&L hedge natural gas during the time the proposed FAC will be in effect?

A: Yes, assuming the Company's projected natural gas requirements during the time the FAC is in effect exceed our threshold for hedging.

Q: What are the costs associated with transporting natural gas?

A: The costs for transporting natural gas fall into two categories. The first category is those costs which are relatively fixed. That includes reservation or demand charges, meter charges, and access charges. The second category of transportation costs is those costs which are volumetric. They include: commodity costs, commodity balancing fees, transportation charges, mileage charges, fuel and loss reimbursement, Federal Energy Regulatory Commission ("FERC") annual charge adjustment, storage fees, and parking fees.

Q: How did you determine the costs associated with transporting natural gas?

A: I separated the cost of transporting natural gas into its various components. I then applied the current tariff or contract rate to the volumes developed by Company witness Burton Crawford. Those various components were then aggregated into either commodity based charges or reservation charges. We plan to update these rates at true-up.

C. <u>Emission Allowance Cost</u>

Q: How did you forecast emission allowance prices?

A: Emission allowance prices were forecast as the average price published in Argus *Air Daily* for August 26 through September 2, 2014. For expense, we used our current book value for Acid Rain Program ("ARP") SO_2 allowances, which is $0. We expect to true-up emission allowance costs.

Q: Are costs for emission allowances included in the COS calculation?

A: Yes. While they will likely be higher in the future they are expected to be $0 at true-up given current inventory, anticipated emission rates, and current regulation.

Q: Do you expect to replace all of these fuel, fuel-related, additive, adder, and emission allowance price or cost estimates with actual prices or costs that are known at true-up?

A: Yes.

D. Fuel Inventory

Q: What is the purpose of this portion of your testimony?

A: The purpose of this portion of my testimony is to explain the process by which KCP&L determines the amount of fuel inventory to keep on hand and how the level of fuel inventory impacts KCP&L's COS.

Q: Why does KCP&L hold fuel inventory?

A: KCP&L holds fuel inventory because of the uncertainty inherent in both fuel requirements and fuel deliveries. Both fuel requirements and deliveries can be impacted by weather. Fuel requirements can also be impacted by unit availability-- both the availability of the unit holding the inventory and the availability of other units in KCP&L's system. Fuel deliveries can also be impacted by breakdowns at a mine or in the transportation system. Events like the 1993 and 2011 Missouri River floods and the 2005 joint line derailments in the Southern Powder River Basin ("SPRB") have caused severe interruptions in the delivery of coal to KCP&L's plants. Fuel inventories are insurance against events that interrupt the delivery of fuel or unexpectedly increase the demand for fuel. All of these factors vary randomly. Furthermore, fuel inventories act like a "shock absorber" when fuel deliveries do not exactly match fuel requirements. They are the working stock that enables KCP&L to continue generating electricity reliably between fuel shipments.

Q: How does KCP&L manage its fuel inventory?

A: Managing fuel inventory involves ordering fuel, receiving fuel into inventory, and burning fuel out of inventory. KCP&L controls inventory levels primarily through its fuel ordering policy. That is, we set fuel inventory targets and then order fuel to achieve those targets. We define inventory targets as the inventory level that we aim to maintain on average during "normal" times. In addition to fuel ordering policy, plant dispatch policy can be used to control inventories. For example, KCP&L might reduce the operation of a plant that is low on fuel to conserve inventory. Of course, this might require other plants in the system to operate more and to use more fuel than they normally would, or it might require either curtailing generation or purchasing power in the market. One can view this as a transfer of fuel "by wire" to the plant with low inventory. To determine the best inventory level, KCP&L balances the cost of holding fuel against the expected cost of running out of fuel.

Q: What are the costs associated with holding fuel inventory?

A: Holding costs reflect cost of capital and operating costs. Holding inventories require an investment in working capital, which require providing investors and lenders those returns that meet their expectations. It also includes the income taxes associated with providing the cost of capital. The operating costs of holding inventory include costs other than the cost of the capital tied up in the inventories. For example, we treat property tax as an operating cost.

Q: Please explain what you mean by the expected cost of running out of fuel.

A: In this context, expected cost means the probability of running out of fuel times the cost of running out of fuel. The cost of running out of fuel at a power plant is the additional cost incurred when a company must use replacement power instead of operating the plant. On the other hand, if the plant runs out of fuel and replacement power is unavailable, a company could fail to meet customer demand for electricity.

Q: How does KCP&L determine the best inventory level, *i.e.*, the level that balances the cost of holding fuel against the expected cost of running out?

A: KCP&L uses the Electric Power Research Institute's Utility Fuel Inventory Model ("UFIM") to identify those inventory levels with the lowest expected total cost. That is, we minimize the sum of inventory holding costs and the expected cost of running out of fuel.

Q: How does UFIM work?

A: UFIM uses a Markov decision model to iterate through various order policies to determine the optimal order policy. It identifies an inventory target as a concise way to express the following fuel ordering policy:

Current Month Order = (Inventory Target – Current Inventory)
+ Expected Burn this Month
+ Expected Supply Shortfall

That is, UFIM's target assumes all fuel on hand is available to meet expected burn. "Basemat" is added to the available target developed with UFIM to determine KCP&L's inventory target. Generally, and in the rest of my testimony, references to inventory targets mean the sum of fuel readily available to meet burn plus basemat.

Q: What is basemat?

A: Basemat is the quantity of coal occupying the bottom 18 inches of our coal stockpile footprint. It may or may not be useable due to contamination from water, soil, clay, or fill material on which the coal is placed. Because of this uncertainty about the quality of the coal, basemat is not considered readily available. However, because it is dynamic and it can be burned (although with difficulty), it is not written off or considered sunk. Eighteen inches was identified in previous KCP&L cases as the appropriate depth for basemat. To determine basemat under our compacted stockpiles, we only consider the area of a pile that is thicker than nine inches. The area of the coal pile that covers either a hopper or concrete slab is not included in the calculation of basemat. The basemat values presented here for all inventory locations are premised on work performed by MIKON Corporation, a consulting engineering firm that specializes in coal stockpile inventories and related services for utilities nationwide.

Q: How does the UFIM model work?

A: The fundamental purpose of UFIM is to develop least-cost ordering policies, *i.e.*, targets, for fuel inventory. UFIM does this by dividing time into "normal" periods and "disruption" periods where a disruption is an event of limited duration with an uncertain occurrence. It develops inventory targets for normal times and disruption management policies. The inventory target that UFIM develops is that level of inventory that balances the cost of holding inventory with the cost of running out of fuel.

Q: What are the primary inputs to UFIM?

A: The key inputs are: holding costs, fuel supply cost curves, costs of running out of fuel, fuel requirement distributions, "normal" supply uncertainty distributions, and disruption characteristics.

Q: What are the holding costs you used to develop coal inventory levels for this case?

A: KCP&L based the holding costs it used to develop fuel inventory levels for this case on the cost of capital proposed by the Company.

Q: What do you mean by "fuel supply cost curves"?

A: A fuel supply cost curve recognizes that the delivered cost of fuel may vary depending on the quantity of fuel purchased in a given month. For example, our fuel supply cost curves for PRB coal recognize that when monthly purchases exceed normal levels, we may need to lease additional train sets. Those lease costs cause the marginal cost of fuel above normal levels to be slightly higher than the normal cost of fuel.

Q: What was the normal cost of fuel?

A: The normal fuel prices underlying all of the fuel supply cost curves were the April 2015 delivered fuel prices used to develop the Company's cost of service for this filing.

Q: Does that mean it would be appropriate to update coal inventory levels included in rate base to reflect information known at true-up?

A: Yes. It would be appropriate to update the coal inventory levels for changes in fuel prices and cost of capital. A change in either the delivered cost of coal or cost of capital may result in different coal inventory levels. For example, lower fuel prices or a lower rate of return than the Company has requested would result in higher inventory requirements.

Q: What did you use for the costs of running out of fuel?

A: There are several components to the cost of running out of fuel. The first cost is the opportunity cost of forgone non-firm off-system power sales. We developed that cost by constructing a price duration curve derived from the distribution of monthly non-firm off-system megawatt-hour transactions for June 2011 through May 2014. We supplemented those points with estimates for purchasing additional energy and using oil-fired generation. The last point on the price duration curve is the socio-economic cost of failing to meet load for which we used KCP&L's assumed cost for unserved load. These price duration curves are referred to in UFIM as burn reduction cost curves. Burn reduction cost curves can vary by inventory, location, and disruption.

Q: What fuel requirement distributions did you use?

A: For all units we used distributions based on projected fuel requirements for January 2015 through December 2016.

Q: What do you mean by "normal" supply uncertainty?

A: We normally experience random variations between fuel burned and fuel received in any given month. These supply shortfalls or overages are assumed to be independent from period to period and are not expected to significantly affect inventory policy. To determine these normal variations, we developed probability distributions of receipt uncertainty based on the difference between historical burn and receipts.

Q: What are disruptions?

A: A disruption is any change in circumstances that persists for a finite duration and significantly affects inventory policy. A supply disruption might entail a complete cut-off of fuel deliveries, a reduction in deliveries, or an increase in the variability of receipts.

A demand disruption might consist of an increase in expected burn or an increase in the variability of burn. Other disruptions might involve temporary increases in the cost of fuel or the cost of replacement power. Different disruptions have different probabilities of occurring and different expected durations.

Q: What disruptions did KCP&L use in developing its inventory targets?

A: KCP&L recognized three types of disruptions in development of its inventory targets:

- Railroad or mine capacity constraints;
- Fuel yard failures; and
- Major floods.

Q: Please explain what you mean by disruptions related to railroad or mine capacity constraints.

A: Supply capacity is the ultimate quantity of coal that can be produced, loaded, and shipped out of the PRB in a given time period. Constraints to supply capacity can come from either the railroads or the mines, but regardless of which of these is the constraint source, the quantity of coal that can be delivered is restricted. A constrained supply caused by railroad capacity constraints can come from an inability of the railroad to ship a greater volume of coal from the PRB. A scenario such as this can arise from not having enough slack capacity to place more trains in-service. It can also come from an infrastructure failure such as the May 2005 derailments on the joint line in the SPRB. The current on-going supply disruption is a railroad capacity constraint issue.

A variety of mine issues can constrain supply, such as there not being enough available load-outs, not enough space to stage empty trains, reaching the productive limits of equipment such as shovels, draglines, conveyors, and trucks, or the mine reaching the production limits specified in its environmental quality permits. We lump the mine and railroad capacity constraints together because they can occur simultaneously and one may mask the other.

Q: Please explain what you mean by disruptions related to fuel yard failures.

A: KCP&L and other utilities have experienced major failures in the equipment used to receive fuel. As used here, "disruption" is designed to cover a variety of circumstances that could result in a significant constraint on a plant's ability to receive fuel.

Q: Please explain what you mean by "major flood" disruptions.

A: The Missouri River has had two major floods in the last twenty years. This disruption was modeled after those floods. Floods can lengthen railroad cycle times as the railroads reroute trains and curtail the deliveries of coal to generating stations.

Q: What are the coal inventory targets used in this case?

A: The coal inventory targets resulting from application of UFIM and their associated value for incorporation into rate base are shown in the attached Schedule WEB-1 **(Highly Confidential)** and are the values used to determine adjustment RB-74, "Adjust Fossil Fuel Inventories to required levels" included in Schedule RAK-2 of the Direct Testimony of KCP&L witness Ronald A. Klote. Since these coal inventory targets are a function of fuel prices, cost of capital and other factors that may be adjusted in the course of this proceeding, we would expect to adjust the coal inventory targets as necessary.

Q: How do the coal inventory targets in the Company's Application compare to the current level of coal inventory the Company has on hand?

A: On September 30, 2014, KCP&L's coal inventory was **[redacted]** of the coal inventory levels incorporated in the Company's filing.

Q: Why is the current level of coal inventory less than the amount in the Company's Application?

A: KCP&L is currently experiencing a severe coal delivery disruption. Railroad, specifically BNSF, coal train velocity has continued to slow down since first quarter 2013. The Surface Transportation Board has been investigating this issue. The reasons for the railroad's poor performance are complex. Perhaps the most significant factor keeping the railroads from recovering is the increase in all rail traffic. Traffic is up for nine of 10 commodity groups and their systems are at or over capacity. Other factors include rerouting caused by the floods, congestion caused by shipments of oil from and drilling resources to the North Dakota's Bakken Shale.

Q: How are the Company's costs affected by coal inventory levels?

A: There are two major costs affected by coal inventory levels. Those are the cost of holding fuel and the cost of running out of fuel. Generally, the cost of holding fuel is much lower than the cost of running out of fuel.

Q: How would the cost of running out of fuel affect the Company's costs?

A: There are several components to the cost of running out of fuel. While the exact order of these costs can vary by inventory location, typically the first cost encountered when inventory levels are low is the opportunity cost of forgone margins from non-firm off-system power sales. Then there are two costs that represent increases in expense of effectively moving coal by wire. First there is the incremental cost of non-economic dispatch as generation is shifted from a unit with low inventory levels to one with more inventory. The second is similar but it is the cost of purchased power as more energy is purchased and another company's fuel is effectively moved by wire to offset our low inventory levels. Finally, although not expected under any reasonably foreseeable scenario, what could prove to be the most traumatic cost of running out of fuel would be the socio-economic cost of failing to meet load.

Q: How does the cost of holding inventory compare to the cost of running out of fuel?

A: Holding costs, which are essentially the cost of capital required to finance the investment, are linear. On the other hand, the expected costs of running out of fuel are best represented by an asymptotic curve. In other words, the relatively minor cost of having too much inventory can be insignificant compared to the cost of running out of fuel. Schedule WEB-2 graphically illustrates the costs associated with maintaining inventory. It shows the cost of holding inventory and the expected cost of running out of inventory for various levels of inventory. The target levels recommended by the Company in this case are those levels (plus basemat) that represent the lowest points on the curve for the sum of holding cost and expected shortage cost. That is, the target level is the point at which the total cost is lowest. The takeaway point of Schedule WEB-2 is how the inventory related costs are not symmetric around the low cost point. The cost of having too little inventory is much greater than having too much inventory.

Q: Why are you recommending inventory levels that are significantly different than current actual levels?

A: As demonstrated above, holding appropriate fuel inventory levels is the least cost approach to meeting customer demand. New rates from this case are not expected to take effect until late September of 2015 and the rail situation is expected to ease in the not too distant future such that KCP&L's fuel inventory levels will begin to recover. BNSF stated in a recent letter to the Surface Transportation Board "we will continue rebuilding stockpiles in 2015, with some completing in 2016."[1]

Q: How were the inventory values for ammonia, lime, limestone, and PAC determined?

A: Inventory values for ammonia, lime, limestone, and PAC were calculated as the average month-end quantity on hand for the 13-month period from August 2013 through August 2014 multiplied by the projected April 2015 per unit value. The inventory values for ammonia, limestone, and PAC are shown in Schedule WEB-1 **(Highly Confidential)** and were included in the derivation of adjustment RB-74.

Q: How were the inventory values for oil determined?

A: Inventory values for oil were calculated as the average month-end quantity on hand for the 13-month period from August 2013 through August 2014 multiplied by the projected April 2015 per unit value. The inventory values for oil are shown in Schedule WEB-1 **(Highly Confidential)** and were included in the derivation of adjustment RB-74.

Q: Will you true-up the fuel additives and oil?

A: Yes. We expect to update these values at true-up.

II. FUEL ADJUSTMENT CLAUSE

A. Factors Considered

Q: Commission Rule 4CSR 240-20.090(2)(C) identifies factors the Commission will consider in determining which cost components to include in a rate adjustment mechanism. Which of those factors will you address?

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[1] Carl R. Ice Chairman and Chief Executive Officer of BNSF Correspondence to Daniel R. Elliott III, Chairman United States Surface Transportation Board, Sept. 15, 2014, http://www.stb.dot.gov/peakletters1.nsf/7b7a1a7001f4b5d285257c78005a09c0/fe7e7b83c5ac872a85257d54006dd698/$FILE/09-15-2014%20Elliott%20Daniel%20Chairman%20STB.PDF.

A: I will address those factors related to the market impact on fuel costs. Specifically, I will discuss:

1. the market impact on fuel costs is volatile;
2. the market impact on fuel costs is substantial; and
3. the market impact on fuel costs is beyond the control of management.

Company witness Tim M. Rush addresses in his Direct Testimony the incentive provided to KCP&L as a result of the inclusion of the cost components in the proposed FAC.

Q: How do changes in fuel markets affect KCP&L's COS?

A: Changes in fuel markets affect KCP&L's COS in multiple ways. The first and most obvious impact is the effect of changes in fuel prices and their direct effect on fuel expense. Changes in fuel prices also affect off-system purchase and sale prices.

1. Fuel Costs Are Volatile

Q: How have fuel prices changed over the past few years?

A: Schedule WEB-3 shows how fuel prices have changed dramatically over the past several years. Schedule WEB-3 shows how since January 2004 the price for natural gas has ranged from $1.91/ million British thermal units ("MMBtu") to $15.38. That is a range of 7 times the lowest price. While not as dramatic as natural gas, oil and coal have also demonstrated significant price changes in that same period. Oil has ranged from $6.13/MMBtu to $29.73 and coal from $0.32/MMBtu to $1.24.

Q: Have natural gas prices continued to demonstrate significant volatility in recent years?

A: Yes, natural gas prices have continued to demonstrate significant volatility. In April 2012 natural gas prices were as low as $1.91 but by February 2014 they had more than tripled to $6.15. In the six months from February to August of this year the price for natural gas dropped almost 40%.

Q: How have PRB coal prices, like natural gas, demonstrated significant volatility in just the past couple of years?

A: Coal prices experienced changes similar to natural gas. In June 2012, PRB coal prices were $0.40/MMBtu. In fewer than two years, the price had almost doubled to $0.76. Just a few months after reaching that high in April 2014, the price had dropped 17% to $0.63.

Q: Can KCP&L manage this volatility through its hedging program?

A: Not completely. As discussed below, KCP&L will manage some of the shorter term volatility in coal through its practice of laddering into a portfolio of coal contracts. Such hedging programs dampen the volatility of fuel prices in the short-term. They do not protect against long-term market shifts or trends. As of June 30, about 70% of KCP&L's expected coal burn from 2015 through 2018 was not under contract.

2. Fuel Costs Are Substantial

Q: How might that market price volatility affect KCP&L?

A: Over the four-year period of 2015 through 2018 KCP&L has significant exposure to market prices. KCP&L is exposed to **[redacted]** million in coal price risk alone.

Q: How did you calculate KCP&L's **[redacted] million in coal price risk?**

A: KCP&L uses a distribution of forecasts to construct a composite forecast which becomes our base forecast. From that distribution we also calculate "low" and "high" forecasts to represent the uncertainty in expectations within the portfolio of independent forecasts used to construct our base forecast. I calculated the coal price risk using the "low" to "high" price range in KCP&L's coal price forecast for anticipated purchases that are not yet under contract.

3. Fuel Costs Are Beyond The Control Of Management

Q: How are the short-term and long-term risks different?

A: The fundamental drivers for the short-term market are different than the key drivers for the long-term market. Short-term markets reflect the convergence of changes in demand expectations and the fundamentals of readily available or stored energy. Some of the short-term fundamental drivers would include events such as storms that might disrupt immediate delivery of the energy. Unexpected temperature spikes or drops can also cause short-term imbalances between the demand and the immediately available supply. Since energy prices tend to be inelastic, these weather induced imbalances can cause significant price spikes especially for natural gas and electricity due to their limited storage.

Long-term markets reflect the convergence of expectations of future potential supply including the cost to produce that supply and future potential demand. For example, the development of shale based natural gas resources has greatly increased the expected supply of natural gas. That in turn has depressed the long-term outlook for natural gas prices. Because most natural gas consumers have inelastic demands but do not have storage, the short-term fundamentals will still drive significant market uncertainty, just at a lower base level than expected before the development of shale gas.

Q: Can KCP&L control the fundamentals that drive the short and long-term markets?

A: No, KCP&L cannot control the market fundamentals for fuel. Perhaps an easy and somewhat subjective way to answer that question is to look at what portion of the market

KCP&L represents. KCP&L's coal burn represents about 2% of the PRB production or about 1% of total U.S. coal production. The Company's natural gas usage is less than 0.01% of U.S. natural gas production. Both of these markets are driven by factors other than KCP&L's market share.

B. Hedging Fuel Market Risk (Price Volatility)

1. Coal Price Hedging

Q: Does KCP&L have a program for managing the price risk of coal?

A: Yes, it does.

Q: Please describe KCP&L's coal price hedging program.

A: In the PRB coal market, the primary means of managing price risk is through a portfolio of forward contracts. Generally KCP&L has been following a modified strategy of laddering into a portfolio of forward contracts for PRB coal. Laddering is an investment technique of purchasing multiple products with different maturity dates. KCP&L's "laddered" portfolio consists of forward contracts with staggered terms so that a portion of the portfolio will roll over each year. **[redacted]**

Q: Does KCP&L buy "spot" coal?

A: Yes. When burn projections increase, or actual burns prove to be higher than anticipated, supplemental purchases of coal are made on the spot market. To ensure the Company has the quality and volume of coal needed for a year, it does not leave all of its requirements for the spot market.

Q: What does that laddered portfolio look like?

A: At mid-year 2014, KCP&L had contractual commitments for essentially all of its expected requirements for 2014 and about 65% of its expected coal requirements for 2015. It also had commitments for about 35% for 2016 and about 15% for 2017.

Q: Does KCP&L update its fuel procurement and planning process to adjust for changes in the marketplace?

A: Yes. KCP&L routinely reviews fuel market conditions and market drivers. We monitor market data, industry publications and consultant reports in an effort to avoid high prices and to take advantage of lower prices. For example, in April 2005, KCP&L determined that a major disruption in the PRB coal market would likely result in PRB coal prices being above normal from fourth quarter 2005 through at least May 2007. In other words, we expected prices to be high **[redacted]**. That warranted a modification to the laddered portfolio strategy in an effort to avoid those high prices. In September 2005, we solicited bids for the coal we would have otherwise purchased in that later time period and finished locking in more of our anticipated requirements through 2007 than we otherwise would have.

Q: How did this strategy perform for KCP&L?

A: Since its implementation some years ago, this strategy has helped us avoid much of the coal market volatility. It has also helped us avoid locking in to the market highs. Using this strategy we have achieved weighted average prices that are below what we would have had to pay if all of our coal had been purchased in the calendar year before use. For **[redacted]** out of the last ten years KCP&L's weighted average mine price for PRB coal was less than CME ClearPort's average for all settlement dates for the year before delivery.

2. Natural Gas Price Hedging

Q: Does KCP&L have a program for managing the price risk of natural gas?

A: Yes.

Q: How does KCP&L use natural gas?

A: KCP&L uses natural gas for multiple purposes. First, KCP&L uses natural gas as the ignition fuel and a supplemental fuel for maintaining flame stability in Hawthorn Unit 5. Second, KCP&L uses natural gas to fuel its combustion turbines: West Gardner Units 1, 2, 3, and 4, Osawatomie, and Hawthorn Units 7 and 8. It also uses natural gas to fuel its combined-cycle plant Hawthorn Units 6 and 9. Finally, KCP&L uses natural gas to increase the peaking capacity of Hawthorn Unit 9 by direct combustion in its heat recovery steam generator. Though the incremental thermal efficiency of direct combustion is lower than that of the base combined-cycle plant, the incremental cost can be lower than the market price for power and the additional electrical output can be valuable during peak load periods.

Q: How does KCP&L's use of natural gas affect how it purchases natural gas?

A: Natural gas-fired generation is among the most expensive generation on KCP&L's system. Consequently it is typically the last to be used and the first to be released. That results in significant day-to-day uncertainty in requirements. To buy KCP&L's gas on a monthly basis as "baseload" would be problematic.

Q: Please describe how KCP&L buys natural gas.

A: Generally KCP&L purchases natural gas as required on a daily basis. Typically the price for that gas is based on a published index such as *Gas Daily.*

Q: What risk is KCP&L managing through its natural gas hedging program?

A: KCP&L's natural gas hedging program mitigates adverse upward price volatility in natural gas.

Q: How did KCP&L develop its hedging strategy?

A: We started by identifying the purpose of our hedging program. We considered the risk with which we were concerned and how we wanted to change that risk.

Q: What is the purpose of KCP&L's natural gas hedging program?

A: The purpose of KCP&L's natural gas hedging program is to reduce the impact of market price volatility for natural gas. Specifically it seeks to mitigate upward price volatility while affording some opportunity to participate in downward price movement. Reducing volatility does not necessarily mean reducing cost. When prices are rising, the hedging program will reduce costs by producing offsetting gains thereby mitigating the effect of rising prices. On the other hand, when prices are falling, the hedging program will produce offsetting losses or costs which limit the benefit of falling prices.

Q: What hedging strategy does a company that is concerned about increasing commodity prices employ?

A: KCP&L is concerned about increasing natural gas prices because it is "short" natural gas. That is, it expects to buy natural gas to fuel its units. A company can hedge its "short" physical position, by going "long" in a financial position. That long position can be constructed through the purchase of futures contracts to "lock in" a future price. A hedger that is willing to pay for the opportunity to take advantage of lower prices while still protecting itself from higher prices might: (1) buy calls, (2) buy calls and sell puts to create a collar, (3) buy calls, sell puts, and sell calls with strikes above the purchased calls to create a 3-way collar, or (4) buy futures and buy puts to create a synthetic call. All four scenarios can protect against the risk of prices moving upward and offer some degree of allowing the hedger to follow market prices down but with different premium costs and risk profiles.

Q: Briefly describe KCP&L's hedging strategy.

A: KCP&L's natural gas hedging program is oriented toward finding a balance between the need to protect against high prices and the opportunity to purchase gas at low prices. KCP&L's hedging program first divides the hedge volume into two parts: that volume expected to be used for native load and the volume expected to be used for off-system sales. Only that volume expected to be used for native load is hedged. It is hedged under two Kase and Company, Inc. hedging programs: HedgeModel and ezHedge.

Q: How did KCP&L develop its program for managing the price risk for natural gas?

A: In 2001 KCP&L retained Kase and Company, Inc., a risk-management and trading technology firm which provides trading, hedging, and analytical solutions for managing market risk, to develop a natural gas price hedging program. In 2010, KCP&L combined its natural gas hedging program with KCP&L Greater Missouri Operations Company's ("GMO") natural gas hedging program. The merged hedging program retains the volume drivers that are unique to each utility. **[redacted]

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[redacted]** The other parameters for the HedgeModel were similar for both the KCP&L and GMO plans, so the merged parameters are not substantially different than either of the original plans.

Q: How does the HedgeModel program work?

A: The approach of the HedgeModel program is to identify statistically favorable points at which to hedge. The strategy can be thought of as a three-zone strategy comprised of high price, normal price, and low price zones. The high price zone identifies prices that are threatening to move upward. In this price zone actions are taken to protect against unfavorable high price levels, mostly through the use of options-related tactics. The normal price zone identifies prices that are in a "normal" range, neither high enough to warrant protecting price, nor low enough to be considered "opportunities." No action is taken whenever prices are deemed to be in the normal price range. The low price zone identifies prices that are statistically low. In this zone, actions are taken to capture favorable forward prices as the market moves into a range where the probability of prices remaining at or below these levels is decreasing. While the main focus in the high price zone is defensive, to set a maximum or ceiling on prices, in the low price zone the focus is on capturing attractive prices.

Q: How does the ezHedge model work?

A: Kase's ezHedge generates hedging signals based on market cycles and uses a volume averaging approach, similar to dollar cost averaging. The model divides a price range into five zones based on an evaluation of percentile levels over a range of look-back periods. It selects the look-back length based on market behavior relative to the highest and lowest zones. This approach results in hedges being placed under all but the most favorable conditions, in which case volumes are left unhedged. The volume averaging aspect results in more frequent hedges when prices are in the lower priced zones and fewer hedges when prices are in the higher price zones.

Q: What distinguishes these two hedging models?

A: EzHedge usually results, over time, in all of the volumes placed in that program being hedged. On the other hand, if prices do not fall low enough, or if prices stay too high, there is a possibility that certain contract months could go unhedged when using HedgeModel. Combining ezHedge with HedgeModel helps ensure that a portion of the exposure has a high probability of being hedged.

Q: How does KCP&L determine the amount of natural gas to hedge under its price risk management program?

A: Within the context of our hedging program, KCP&L refers to the sum of natural gas requirements for the Missouri jurisdictional share of native load, firm wholesale sales, and fuel loss reimbursement as the projected usage. **[redacted]**

Q: How does KCP&L's hedging program manage the risk of volume uncertainty?

A: One reason for leaving the forecast volume to serve off-system sales unhedged is to provide a cushion for the possibility that total actual requirements may turn out to be less than projected.

Q: Does KCP&L adjust its hedges for changes in projected usage?

A: Yes. KCP&L updates its projected requirements monthly. If the projected requirements are determined to be significantly different than prior projections, hedge volumes may be adjusted. If the volumes increase, the increases are added to the volume available to hedge. If the volumes decrease but the decrease is not material and we already have the allowable volumes hedged, those hedges that exceed the allowable volumes are liquidated. If the decrease was material, we would develop a remediation strategy.

Q: How often does KCP&L use the HedgeModel and ezHedge?

A: KCP&L monitors the HedgeModel and ezHedge daily. How often KCP&L places a hedge is determined by how the market moves through the price zones and the volume to be hedged.

Q: Have you evaluated the performance of KCP&L's natural gas hedging program?

A: Yes.

Q: How did you evaluate the performance of KCP&L's natural gas hedging program?

A: I examined its purpose and cost.

Q: Based on your evaluation how has this program performed for KCP&L?

A: The purpose and value of the hedging program is to limit or reduce the Company's exposure to natural gas market price risk. KCP&L has used this program to hedge natural gas price risk since 2002. Each year that the program has been employed it has reduced KCP&L's exposure to natural gas price risk.

In addition to accomplishing the primary program purpose of reduced exposure to large upward price fluctuations, the results of the hedging program compared favorably to spot gas pricing for the months with hedges. Since KCP&L's hedging program was implemented in 2002, the Company's average "all-in" price of natural gas, which includes the cost of option premiums and swap settlements, has been **[redacted]**. Had the Company not hedged, its average cost of natural gas would have been **[redacted]**. In other words, for a mere **[redacted]** KCP&L's hedging program provided protection from large unexpected upward price fluctuations. That compares very favorably to the current market of about 10% premiums for "at the money" call options for next summer.

3. Nuclear Fuel

Q: Please describe how KCP&L buys nuclear fuel.

A: Wolf Creek Nuclear Operating Corporation ("Wolf Creek") purchases uranium and has it processed for use as fuel in Wolf Creek's reactor. This process involves conversion of uranium concentrates to uranium hexafluoride, enrichment of uranium hexafluoride, and fabrication of nuclear fuel assemblies.

Q: How has Wolf Creek hedged its future purchases of uranium and conversion services?

A: The owners of Wolf Creek have on hand or under contract all of the uranium and conversion services needed to operate Wolf Creek through September 2016 and approximately 70% after that date through March 2021. The owners also have under contract all of the uranium enrichment and fabrication required to support reactor operation through March 2027 and September 2025, respectively.

C. Emission Allowance Purchases and Sales

Q: What is the purpose of this portion of your testimony?

A: I will discuss the legal requirements for emission allowances and explain KCP&L's current strategy for meeting those requirements.

Q: What emissions are KCP&L required to offset with allowances?

A: For 2015, KCP&L is required to offset SO_2 and NO_x emissions with allowances issued by the Environmental Protection Agency ("EPA").

Q: What rules or regulations established the need for emission allowances?

A: Title IV of the 1990 Clean Air Act established the allowance market system known today as the ARP. Title IV set a cap on total SO_2 emissions and aimed to reduce overall emissions to 50% of 1980 levels. In 2005, the EPA promulgated the Clean Air Interstate Rule ("CAIR"). The CAIR continued the cap and trade approach to further reduce SO_2 emissions and extended it to NO_x emissions. In 2011 the EPA finalized the Cross-State Air Pollution Rule ("CSAPR") which was to replace CAIR. CSAPR creates an additional allowance system for SO2 emissions. Title IV allowances cannot be used to comply with the CSAPR. Sources covered by the ARP must still use Title IV allowances to comply with that program.

Q: Will emissions allowance costs or sales margins be included in the FAC?

A: Yes, but as discussed above, KCP&L has sufficient ARP SO_2 allowances to meet its immediate needs under CAIR. KCP&L was also allocated allowances under CSAPR. With the La Cygne environmental upgrades, KCP&L expects the allocated allowances will be sufficient to meet CSAPR's requirements but future laws, rules, or regulations could change that position.

Q: What are KCP&L's forecasted allowance purchases and sales?

A: **[redacted]** KCP&L may reconsider this position in light of future changes in the laws, rules, or regulations governing emission allowances.

III. LA CYGNE RETRO-FIT FUEL AND EMISSION PRICE FORECASTS

A. KCP&L'S Long-Term Forecast Method

Q: How did you contribute to the La Cygne environmental upgrade project decision?

A: I provided the fuel and emission allowance price forecasts.

Q: Why will you be testifying on these issues?

A: As discussed in the Direct Testimony of Company witness Burton Crawford, natural gas prices and carbon dioxide ("CO_2") prices were critical uncertainties in the analysis of the La Cygne environmental upgrade project.

Q: When were the fuel and emission price forecasts used in the La Cygne environmental upgrade project prepared?

A: October 2010.

Q: How did KCP&L develop long-term price forecasts for fuel and emissions?

A: KCP&L used (and still uses) composite price forecasts for fuel and emission allowance commodities. The various commodity price forecasts used in the composite price forecasts were obtained from independent consulting firms and/or government agencies that had expert knowledge and experience with the particular commodity. KCP&L also used the set of commodity price forecasts to develop probability distributions around those composite forecasts.

Q: Does KCP&L only use composite forecasts for regulatory filings?

A: No. KCP&L uses composite forecasts for its everyday business planning processes. The forecasts that are used for regulatory filings use the same basic model we routinely use for normal business activity and internal financial projections.

Q: Why does KCP&L use composite forecasts for fuel and emission allowance commodities?

A: KCP&L determined that of the various forecasts it has reviewed, no single forecast provider always outperforms all others. On the other hand, the combination or composite of those various forecasts consistently is more accurate than most of the individual forecasts that it represents. In any one year, some forecasting services will do better than the composite in terms of predicting the correct outcome. These "top performers" will vary from year to year and are very difficult if not impossible to identify in advance.

Q: Does the academic research support KCP&L's finding regarding the relative accuracy of composite forecasts?

A: Yes. KCP&L's finding is consistent with academic research showing that forecast combinations have, on average, been found to produce better forecasts than methods based on the ex-ante best individual forecasting model.

Q: Why would you expect composite forecasts to perform better than individual forecasts?

A: Many factors can affect independent forecasts. Using a composite aggregates all of those factors. While not always the case, combining forecasts can also help improve forecast accuracy by balancing the forecast errors and biases of individual forecasts.

Q: Who were the independent consulting firms and/or government agencies that you used in developing your October 2010 natural gas price forecasts?

A: KCP&L used forecasts from Cambridge Energy Research Associates ("CERA"), Energy Ventures Analysis ("EVA"), EIA, Global Insight, and PIRA Energy Group ("PIRA") to construct its composite price forecasts for natural gas.

Q: Who were the independent consulting firms and/or government agencies that you used in developing your October 2010 coal price forecasts?

A: KCP&L used forecasts from EVA, EIA, JD Energy ("JDE"), and Wood Mackenzie Limited to construct its composite price forecasts for long-term coal prices.

Q: Please explain the process you used to determine the probabilities for the high and low prices.

A: Our probabilities are statistically calculated. They are not based on the biases of any individual's subjective judgment. We used the distribution of forecasts used to construct the composite to calculate the standard deviation of prices for each year of the forecast period. That standard deviation was multiplied by the t-values from the Student's t-distribution[2] for the 10^{th} and 90^{th} percentiles and applied to the average of the forecasts to calculate the "low" and "high" forecasts respectively with one note worthy exception. That exception was CO_2. Because of the uncertainty around whether Congress would create a market for CO_2, we used zero as the low side of the CO_2 price distribution.

[2] The t density curves are symmetric and bell-shaped like the normal distribution and have their peak at 0. However, the spread is more than that of the standard normal distribution. It is better suited for small sample sizes than the standard normal distribution.

Q: Why do you calculate the probabilities using statistics rather than subjectively assigning them?

A: It is a deliberate effort to eliminate biases regarding the probabilistic distribution of forecast prices. It is how we extend the benefits of a composite forecast to a forecast distribution.

B. <u>October 2010 Natural Gas Price Forecast</u>

Q: What was the historical context leading up to the natural gas price projection you made in 2010?

A: Schedule WEB-4 shows how natural gas prices changed dramatically in the years leading up to October 2010. Natural gas in December 2004 was about \$6.83/MMBtu. In December 2005 it climbed to a peak of \$15.38/MMBtu and then dropped to \$4.20/MMBtu in September 2006. Those moves represented a climb of 125% followed by a decline of 73%. By July 2008 natural gas had returned to \$13.58/MMBtu but then dropped 82% to \$2.51/MMBtu, a price level it had not seen since March 2002. By the end of March 2010 natural gas was trading near \$4.00/MMBtu. In early October 2010, it was trading near \$3.70/MMBtu.

Q: How did those historical natural gas prices compare to historical coal prices?

A: Schedule WEB-5 compares Henry Hub natural gas prices with the cost of PRB low-sulfur coal delivered to La Cygne using the market price for coal and a freight rate estimate consistent with the then current rail pricing paradigm. It shows that, Btu-for-Btu, natural gas was consistently more than twice as expensive as coal. Schedule WEB-6 takes that comparison one step further by comparing the \$/MWh equivalent of the two fuels assuming a 7,000 Btu/kWh heat rate for natural gas and a 10,000 Btu/kWh heat rate for coal. Even giving natural gas the benefit of a combined cycle heat rate, there were only 29 days over the decade when the price of natural gas would have been less than the delivered price of coal at La Cygne. If we add transportation costs to the price of natural gas, it drops that 29 days to one week or less out of ten years.

Q: In October 2010, what were KCP&L's expectations regarding the future price of natural gas?

A: Schedule WEB-7 **(Highly Confidential)** shows the natural gas price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station. Generally it shows that on a nominal basis, we expected a distribution of future prices that was consistent with the distribution we saw between 2000 and 2011.

Q: In October 2010, what were KCP&L's expectations regarding the cost of PRB coal delivered to La Cygne?

A: Schedule WEB-8 **(Highly Confidential)** shows the coal price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station. For every year of the forecast, the base and high prices for natural gas were projected to be more than double the high scenario for the delivered cost of PRB coal to La Cygne.

C. CO_2 Prices

Q: In October 2010, what were KCP&L's expectations regarding the future price of CO_2?

A: Schedule WEB-9 **(Highly Confidential)** shows the CO_2 price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station.

Q: How did KCP&L develop long-term price forecasts for emissions allowances?

A: As I discussed with natural gas, KCP&L used composite price forecasts for fuel and emission allowance commodities. The various commodity price forecasts used in the composite price forecasts were obtained from independent consulting firms and/or government agencies that had expert knowledge and experience with the particular commodity. KCP&L also used the set of commodity price forecasts to develop probability distributions for each with one exception; the Company replaced the calculated low CO_2 price forecast with a zero CO_2 price scenario.

Q: What independent consulting firms and/or government agencies did you use in developing your October 2010 CO_2 forecast?

A: The CO_2 composite price forecast was developed from forecasts by CERA, Synapse, PIRA, EVA, EIA, EPA, and JD Energy.

Q: Why did the Company develop a zero CO_2 price scenario?

A. Our zero CO_2 price scenario was developed in October 2010. By then we had observed that after the U.S. House of Representatives had passed the comprehensive Waxman-Markey bill in June 2009, Senate Democrats had been unable to find the votes necessary to pass a cap-and-trade bill. In late July 2010, Senate Democrats conceded they did not have the votes to pass a comprehensive energy bill addressing climate change. With Republicans poised to gain a large number of seats and possibly the majority in both houses in the November elections, it appeared unlikely that any legislation establishing a carbon penalty would pass before 2013.

Q: Please describe the zero CO_2 price scenario.

A: The zero CO_2 price scenario basically means we do not have to either pay a tax or purchase an allowance to emit CO_2. It does not necessarily mean there is no regulation or law governing CO_2 emissions. Nor does it mean there will be no cost to comply with such a CO_2 control program. It merely means we do not have to make a cash payment for each ton of CO_2 emitted.

Q: Is the zero CO_2 price scenario is still reasonable?

A: Yes. On June 2, 2014, the EPA released its "Clean Power Plan" as its proposal for reducing carbon emissions from power plants. That proposal did not establish a market-based mechanism for reducing CO_2 emissions. Instead it established state-by-state targets in pounds of CO_2 emissions per megawatt hour of power creating a separate rate-based standard for each state. While states may create trading programs, it is unlikely that all states will either create their own intra-state market-based program or join a multi-state market-based program.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light	)	
Company's Request for Authority to Implement	)	Case No. ER-2014-0370
A General Rate Increase for Electric Service	)	

AFFIDAVIT OF WILLIAM EDWARD BLUNK

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

William Edward Blunk, appearing before me, affirms and states:

1. My name is William Edward Blunk. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Generation Planning Manager.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of forty (40) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby affirm and state that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

[signature]
William Edward Blunk

Subscribed and affirmed before me this 30th day of October, 2014.

[signature]
Notary Public

My commission expires: Feb. 4, 2015

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2015
Commission Number: 11391200

SCHEDULE WEB-1

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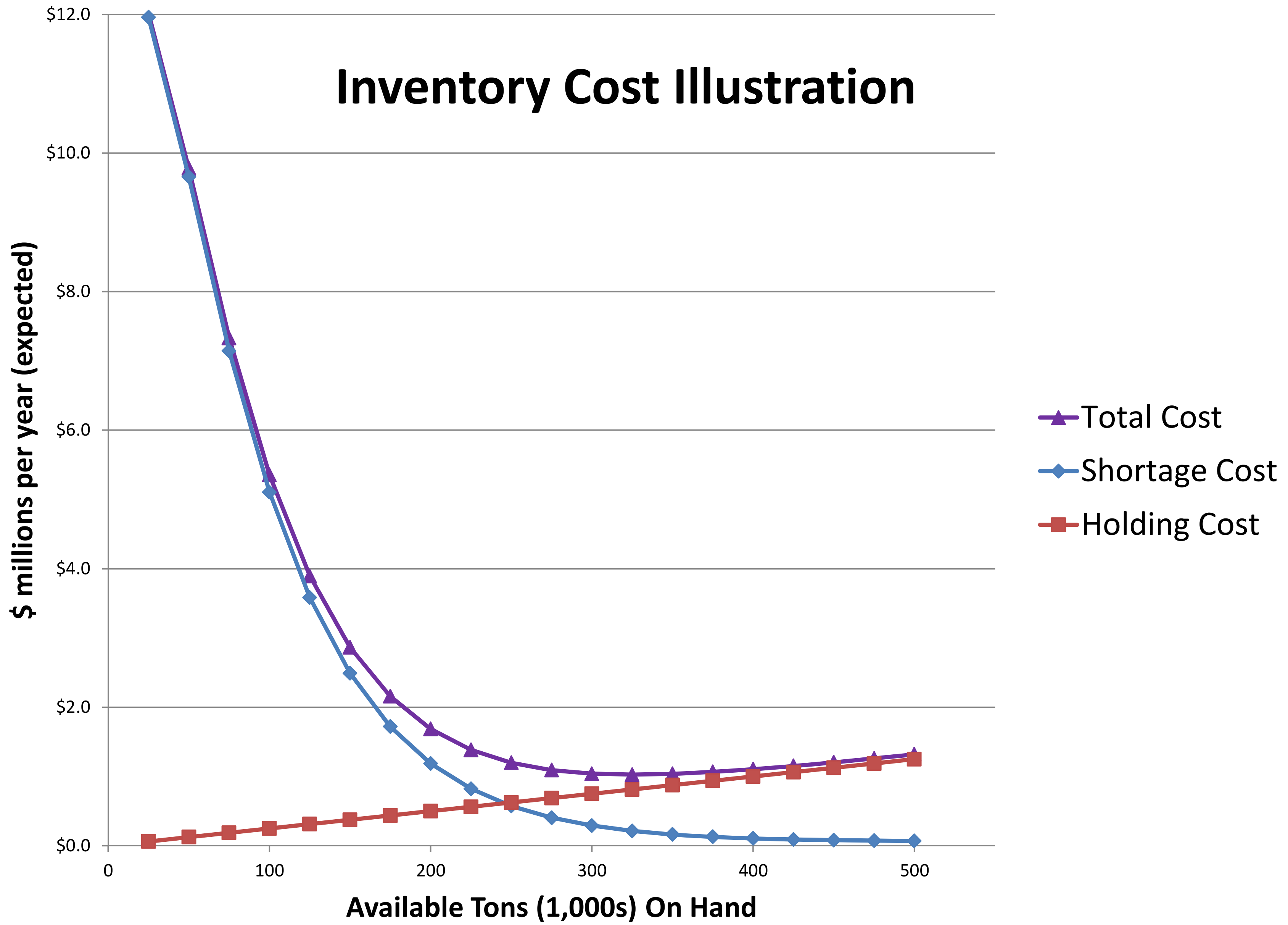
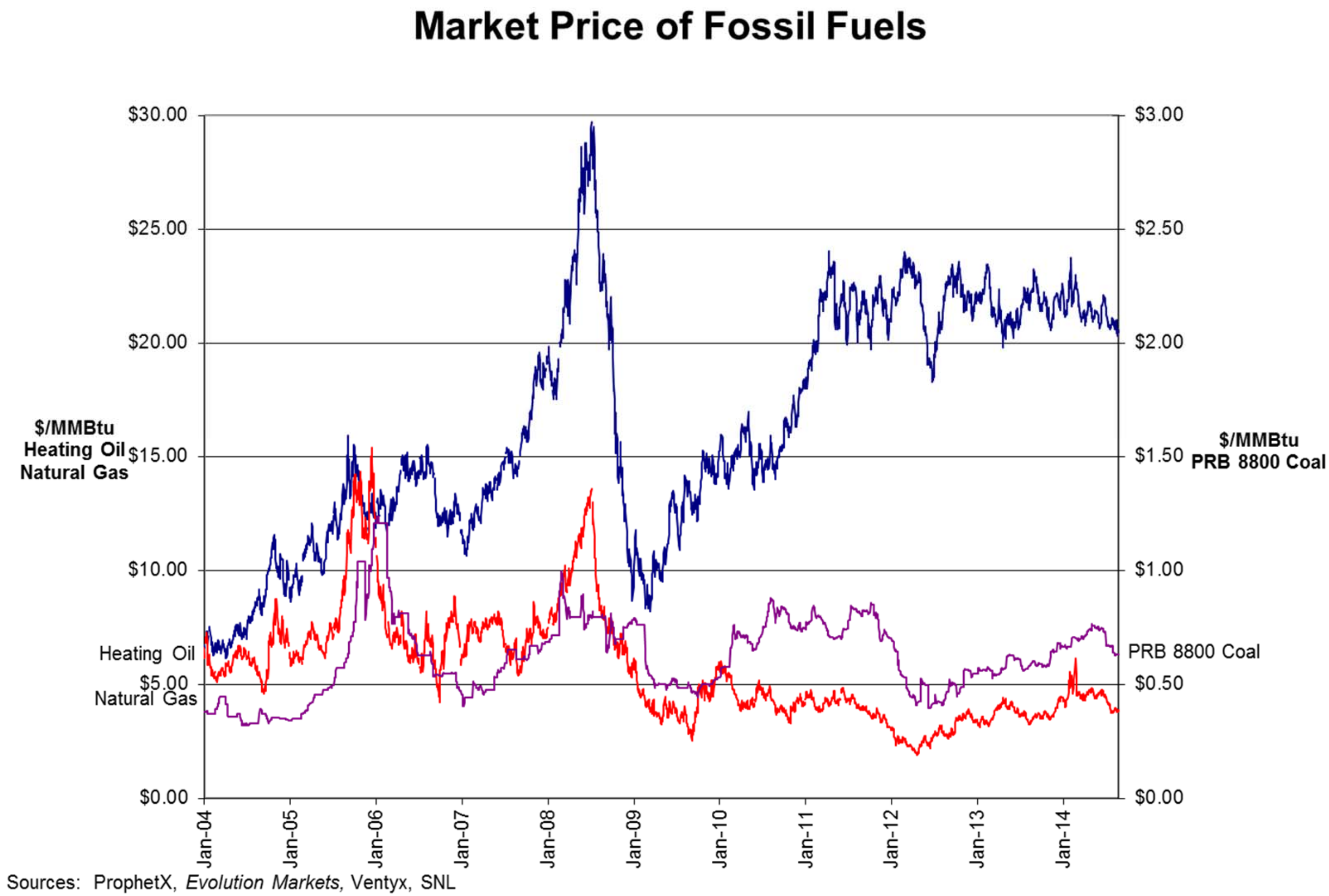


Schedule WEB-2


Market Price of Fossil Fuels
$/MMBtu
Heating Oil
Natural Gas
$/MMBtu
PRB 8800 Coal
$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$0.00
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
$0.00
Heating Oil
Natural Gas
PRB 8800 Coal
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
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Jan-10
Jan-11
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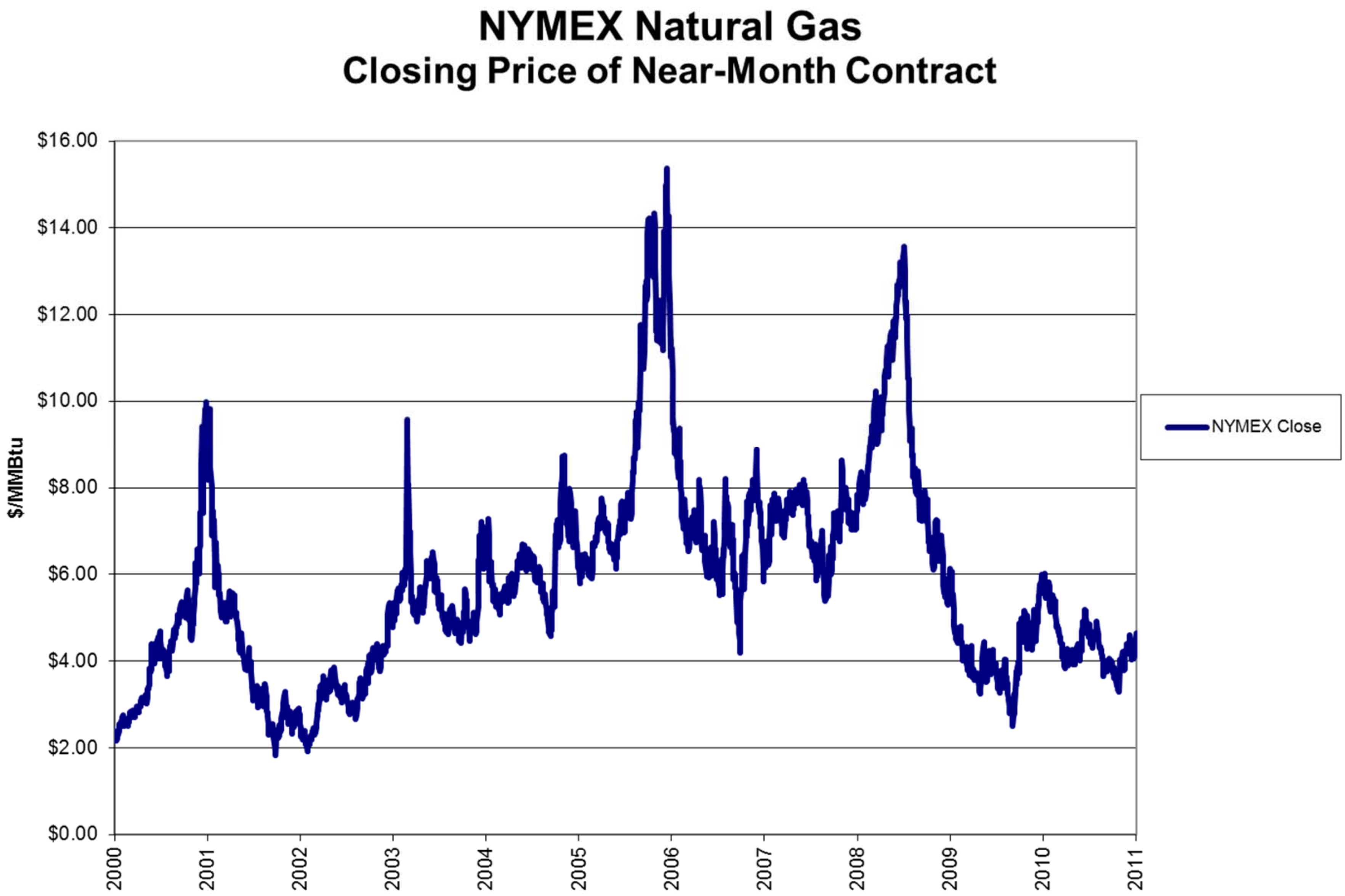
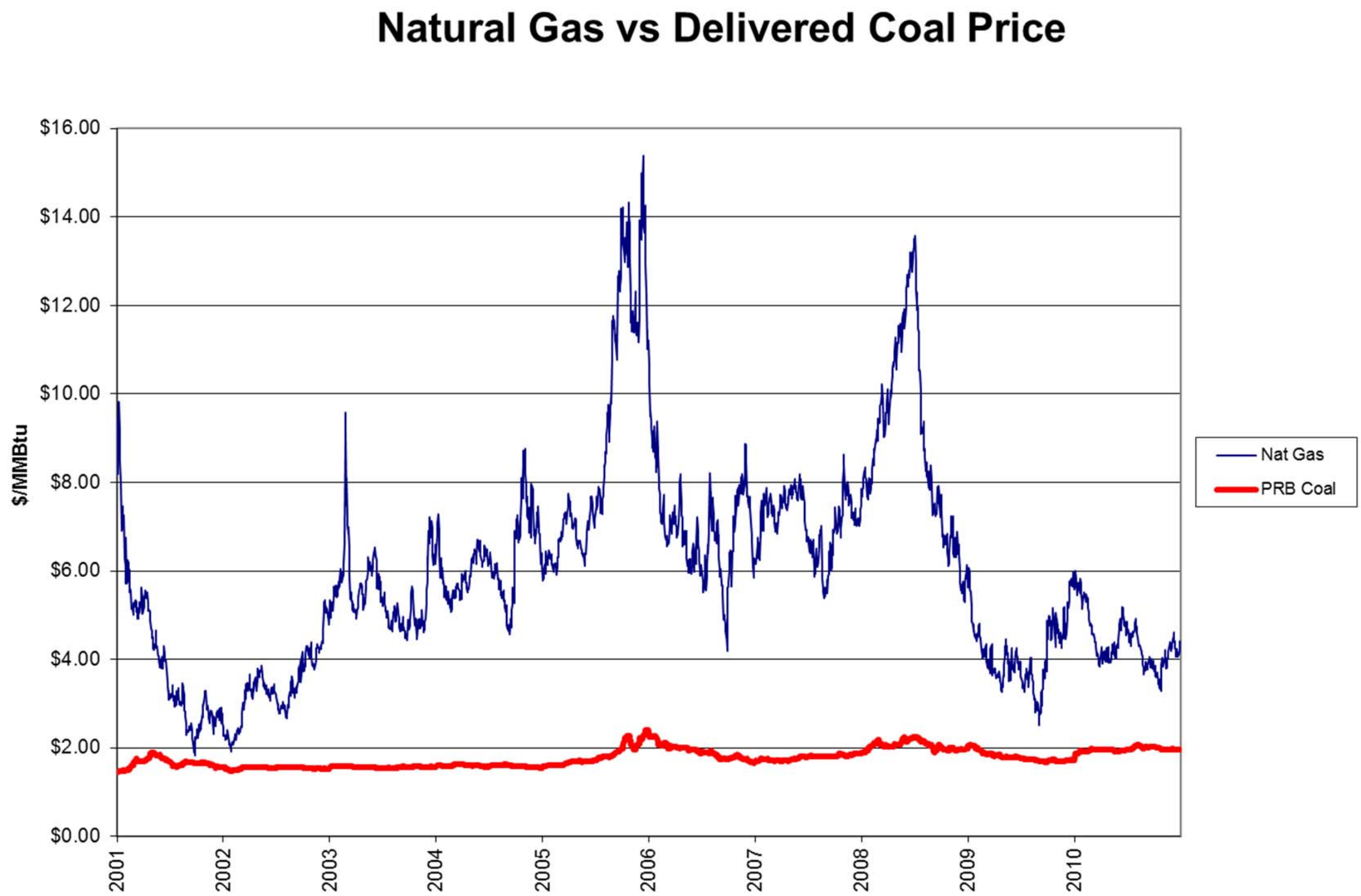
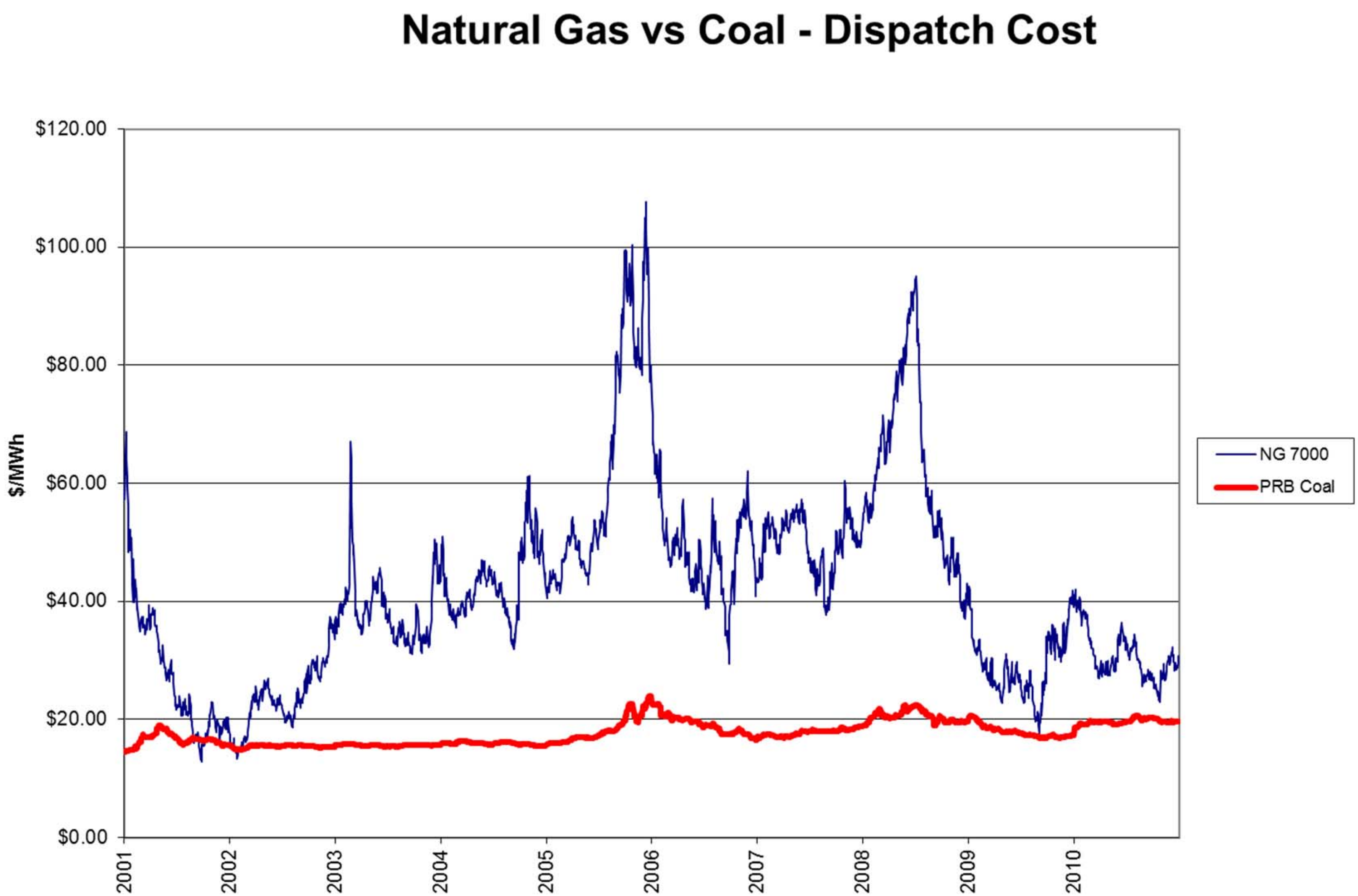
Sources: ProphetX, Evolution Markets, Ventyx, SNL



Schedule WEB-4



Schedule WEB-5


Natural Gas vs Coal - Dispatch Cost
$/MWh
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$0.00
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
NG 7000
PRB Coal

SCHEDULES WEB-7 through WEB-9

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