KCPL GREATER MISSOURI OPERATING COMPANY

RISK SENSITIVITY ANALYSIS

STAKEHOLDER PROCESS

EO-2009-0237

PRELIMINARY REPORT

JULY 16, 2010

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SECTION 1: GENERAL PROVISIONS OF RISK ANALYSIS

1.1 ITEMS TO STUDY

The settlement agreement of Case EO-2209-0237 stipulated that the Company will study the impact of two additional risk factors: a Federal Energy Efficiency Standard and Smart Grid. This paper documents the proposed method of analyzing these two factors to determine if they are a Critical Uncertainty Factor as defined in 240-22.070 (2).

SECTION 2: FEDERAL ENERGY EFFICINCY STANDARD

2.1 PROPOSED RULE BY THE COMPANY

At the June Stakeholder Meeting, the Company proposed using Title II of The American Clean Energy and Security Act of 2009 (Waxman-Markey Bill) this comprehensive climate and energy legislation would establish an economy-wide, greenhouse gas (GHG) cap-and-trade system. Title II of the Act sets national targets for energy efficiency by customer class. These and other complementary measures are meant to address climate change and build a clean energy economy. The House Energy and Commerce Committee voted 33-25 to approve the ACES Act on May 21, 2009. The Act passed the House on June 26, 2009 by a vote of 219 to 212.

Using the definition of the targets for energy efficiency in Title II, the Company proposed a level of national energy reduction to be used in the national power price forecasting model. These targets were shared with the Stakeholder parties.

2.2 STAFF PROPOSED RULE

At the June Stakeholder Meeting, Staff proposed using the Save American Energy Act, HR 889 bill to use as a basis for analysis. The bill will amend Title VI of the Public Utility Regulatory Policies Act of 1978 to establish a Federal energy efficiency resource standard for retail electricity and natural gas distributors.

This bill is in the first step in the legislative process. Introduced bills and resolutions first go to committees that deliberate, investigate, and revise them before they go to general debate. It was introduced on February 4, 2009 and referred to the House Energy and Commerce Committee.

The Company agrees to use the energy efficiency targets and alternative payment structure to simulate the effect of a Federal Energy Standard on the IRP alternative plan selection.

2.3 SALIENT FEATURES OF HR 889

HR 889 introduces a federal energy efficiency mandate upon all utilities based on retail energy load.

2.3.1 BASE QUANTITY

A Base Quantity is determined for each utility and required energy reduction mandates are set as percent targets from this quantity. The complete definition of Base Quantity is given in Section 610 (b) (3) of the bill as follows:

> (3) BASE QUANTITY- The term 'base quantity', with respect to a retail electricity distributor or retail natural gas distributor, means, for each year for which a performance standard is established under subsection (d), the average annual quantity of electricity or natural gas delivered by the retail electricity distributor or retail natural gas distributor to retail customers during the 2 calendar years immediately preceding such year. In determining the base quantity of a retail natural gas distributor, natural gas delivered for purposes of electricity generation shall be excluded.

Since the Base Quantity is set in the future from recent actual retail energy sales, a forecast needs to be selected for use as a future Base Quantity. For the risk analysis, the Base Quantity forecast will be the load forecast from the GMO 2010 budget.

2.3.2 ANNUAL ENERGY EFFICIENCY TARGETS

These targets are listed in Section 610 (d) (2) of the bill. The percentages applicable to retail electric distributors are detailed in Table 1: Annual Energy Efficiency Targets.

Table 1: Annual Energy Efficiency Targets

National Annual Energy Reduction from Baseline			
Year	Percent	Year	Percent
2010	0.00%	2020	15.00%
2011	0.00%	2021	15.00%
2012	1.00%	2022	15.00%
2013	2.00%	2023	15.00%
2014	3.25%	2024	15.00%
2015	4.50%	2025	15.00%
2016	6.00%	2026	15.00%
2017	7.50%	2027	15.00%
2018	10.00%	2028	15.00%
2019	12.50%	2029	15.00%

2.3.3 ALTERNATIVE COMPLIANCE PAYMENTS

The bill proposes a federal alternative compliance payment in Section 610 (g) (2) (A) as follows:

> (A) $100 per megawatt-hour of electricity savings or alternative compliance payment that the retail electricity distributor failed to achieve or make, respectively;

Since the bill does not specifically declare the alternative compliance payment is fixed, it is assumed that this compliance payment will increase over time with the rate of inflation. The $100 price for alternative compliance price will be set for 2012, the first year of required reductions.

Table 2: Alternative Compliance Payments

Alternative Compliance Payment per MWhr			
Year	Cost	Year	Cost
2010	$ -	2020	$ 121.84
2011	$ -	2021	$ 124.89
2012	$ 100.00	2022	$ 128.01
2013	$ 102.50	2023	$ 131.21
2014	$ 105.06	2024	$ 134.49
2015	$ 107.69	2025	$ 137.85
2016	$ 110.38	2026	$ 141.30
2017	$ 113.14	2027	$ 144.83
2018	$ 115.97	2028	$ 148.45
2019	$ 118.87	2029	$ 152.16

2.4 METHOD OF ANALYSIS

The sensitivity analysis will be methodologically identical to the analysis used in the 2009 GMO IRP. It will use the CapEx Model to determine the impact of the bill should it become law. A base and a test scenario are defined to perform this analysis.

2.4.1 BASE SCENARIO - FEDERAL EE STANDARD RISK

The Base Scenario will use all the mid-level risk values from the GMO IRP. The only adjustments will be an update of the load forecast to the GMO 2010 corporate budget forecast and update of the cost of construction for wind generation.

A new set of Eastern Interconnect wholesale market power prices are also being developed to incorporate the most recent Ventyx Reference Case national long-term load forecasts. This wholesale market power price forecast is identical to the wholesale price forecast used in the Base Scenario-Smart Grid Risk

One last adjustment is to the assumed available level and price of energy efficiency. In order to fairly compare the base scenario with the test scenario, both must have the same option of available energy efficiency. Since the Test Scenario will have mandated efficiency that can be no higher that the alternative compliance price, The

DSM option available in the Base Scenario will allow for energy efficiency programs that cost as much as the alternative compliance penalty.

2.4.2 TEST SCENARIO - FEDERAL EE STANDARD RISK

The Test Scenario for the Federal Energy Efficiency Standard will be different from the Base Scenario for Federal Energy Efficiency in two regards.

First, the Test Scenario will force the CapEx Model to select the DSM option in its final expansion plan. Secondly, the wholesale power market price forecast will have an assumption that all retail load across the Eastern Interconnect has complied with the Standard, and reduced total loads from the original Eastern Interconnect energy forecast by the percentages listed in Table 1: Annual Energy Efficiency Targets.

SECTION 3: SMART GRID

3.1 BASIS OF ANALYSIS

To begin this study, the Company referred to the July 2009 “Smart Grid System Report” published by the U.S. Department of Energy. The study appendix lists 20 metrics that will be used to determine the effectiveness of Smart Grid activities.

Many of these metrics do not lend themselves to production cost based analysis. Others have no direct cost but provide indirect benefit such as consumer acceptance, data sharing measures or reductions in customer complaints. Only one metric can be modeled in such a way to demonstrate an impact on system production costs.

3.2 DYNAMIC LINE RATINGS

Metric #16, Dynamic Line Ratings, would have a direct impact on the assumptions used to develop national market clearing prices for wholesale power. The MIDAS ™ Model assumes inter regional transfers of power are possible and power is allowed to flow in the model to help lower overall system costs and reduce the resultant market clearing price for wholesale power.

The DOE Report estimates that a 10 – 15% increase in transmission power flow would be capable over 95% of all operating hours. The Company used an increase in the assumed level of power flow capability nationally to simulate in the power price model the impact of Smart Grid technology.

Table 3: Interregional Power Flow Improvement from Smart Grid

Interregional Power Flow Improvement Multipliers			
Year	Multiplier	Year	Multiplier
2010	-	2020	1.09
2011	-	2021	1.10
2012	1.01	2022	1.11
2013	1.02	2023	1.12
2014	1.03	2024	1.13
2015	1.04	2025	1.14
2016	1.05	2026	1.15
2017	1.06	2027	1.15
2018	1.07	2028	1.15
2019	1.08	2029	1.15

3.3 METHOD OF ANALYSIS

The sensitivity analysis will be methodologically identical to the analysis used in the 2009 GMO IRP. It will use the CapEx Model to determine the impact of the Smart Grid should it increase inter-regional power flows. A base and a test scenario are defined to perform this analysis.

3.3.1 BASE SCENARIO-SMART GRID

The Base Scenario for Smart Grid Risk is identical to the Base Scenario for the Federal Energy Efficiency Standard with the exception that the DSM option is now returned to the level and cost used in the GMO IRP. This Base Scenario utilized all mid-level risks from the GMO IRP. It updates the load forecast to the GMO 2010 corporate budget load forecast and uses updated costs of wind construction. The wholesale market power price forecast is also updated to the Ventyx Reference Case Eastern Interconnect national energy consumption forecast. This power price forecast is identical to the price forecast used in the Base Scenario for the Federal Energy Efficiency Standard risk analysis.

3.3.2 TEST SCENARIO-SMART GRID

The Test Scenario uses identical inputs to the Base Scenario except for the wholesale power price forecast. The power price model is run assuming an increased interregional power flows. This allows the market to dispatch generation more efficiently, lowering wholesale power prices.