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SOAH DOCKET NO. 473-19-6862  
PUC DOCKET NO. 49737

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APPLICATION OF SOUTHWESTERN § BEFORE THE STATE OFFICE  
ELECTRIC POWER COMPANY FOR §  
CERTIFICATE OF CONVENIENCE § FILING CLERK  
AND NECESSITY AUTHORIZATION § OF  
AND RELATED RELIEF FOR THE §  
ACQUISITION OF WIND § ADMINISTRATIVE HEARINGS  
GENERATION FACILITIES §

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO OFFICE OF  
PUBLIC UTILITY COUNSEL'S SECOND REQUEST FOR INFORMATION**

**OCTOBER 14, 2019**

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**Files provided electronically on the PUC Interchange**

OPUC\_2\_10\_Attachment\_1.xlsx

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**Question No. 2-1:**

Refer to the direct testimony of Karl Bletzacker at page 6. Please provide the results of the fundamentals forecast using 10-year normal heating and cooling degree days rather than 30-year normal degree days.

**Response No. 2-1:**

An AEPSC Fundamentals Forecast with the assumption that prior 10 year heating and cooling degree days would continue through the entire forecast period has not been performed.

Prepared By: Connie S. Trecuzzi

Title: Economic Forecast Anlyst Staff

Sponsored By: Karl R. Bletzacker

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**Question No. 2-2:**

Refer to the direct testimony of Karl Bletzacker at page 7. Please explain the basis for Mr. Bletzacker's assertion that NYMEX futures contract prices are not a reliable forecast of long-term energy market prices because the total number of futures contracts held by market participants is extremely low beyond two years.

**Response No. 2-2:**

Bletzacker Direct Testimony, page 7, lines 5-8 states; "The total number of futures contracts held by market participants (*i.e.*, *Open Interest*) is extremely low, or zero, for NYMEX natural gas futures beyond the near term (less than two years) as illustrated in Figure 2."

Little or no open interest beyond the near term implies there are very few, if any, counterparties to sell (and buy) futures contract(s) at the indicated values. This does not provide pricing clarity even to the traditional natural gas futures market participants (typically hedging, spreading or speculating). Also stated in Bletzacker Direct Testimony, page 7, lines 11-14; "In addition to the illiquidity of the NYMEX natural gas futures contract beyond the near term, NYMEX natural gas futures contracts are not available at all beyond the next twelve years. The Company's model-driven natural gas price forecasts extend more than thirty years."

Prepared By: Connie S. Trecuzzi

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**Question No. 2-3:**

Refer to the direct testimony of Karl Bletzacker at page 7. Please explain the basis for Mr. Bletzacker's assertion that if any attempt is made to purchase natural gas futures contracts beyond two years, the increased demand would likely increase prices.

**Response No. 2-3:**

Bletzacker Direct Testimony, page 7. lines 8-11 states; "Furthermore, price propositions shown for this period of little or no open interest may not reflect actual NYMEX transactions, and should any attempt be made to purchase natural gas futures contracts in this period, the increased demand would likely run up prices."

Each NYMEX natural gas futures contract has a "bid-ask" spread. The bid-ask spread is the difference between the prices quoted for an immediate purchase (bid) and an immediate sale (ask) of natural gas futures contract pairs. Typically, the bid-ask spread widens for contracts further out in time. Depending on the quantity attempting to be bought (or sold), natural gas futures contracts in a period of little or no open interest (currently years 3-12) are susceptible to price volatility (commonly referred to as a "squeeze") when a counterparty (buyer or seller) attempts to profit from this imbalance by restricting the sale (or purchase) of the futures contract. Due to this price volatility, it may not be possible to secure any significant quantity of natural gas futures at the prices quoted by NYMEX for future periods of little or no open interest.

Ultimately, NYMEX energy-complex futures prices (and extrapolations of NYMEX-generated theoretical values) are not a reliable forecast of future, weather-normalized, long-term energy market prices.

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**Question No. 2-4:**

Refer to the direct testimony of Karl Bletzacker at page 7. Please explain the basis for Mr. Bletzacker's assertion that the NYMEX natural gas futures contract is not liquid beyond two years. Does he believe that parties cannot enter into a futures contract beyond two years? If so, please explain why.

**Response No. 2-4:**

Company witness Bletzacker does not make the assertion that the NYMEX natural gas futures is "not liquid" beyond two years. Bletzacker Direct Testimony, page 7, lines 5-8 states; "The total number of futures contracts held by market participants (*i.e.*, Open Interest) is *extremely low, or zero*, for NYMEX natural gas futures beyond the near term (less than two years) as illustrated in Figure 2." Also, Bletzacker Direct Testimony, page 7, lines 11-13 states, "In addition to the *illiquidity* of the NYMEX natural gas futures contract beyond the near term, NYMEX natural gas futures contracts are not available at all beyond the next twelve years." "Illiquidity" is formally defined as: (of assets) not easily converted into cash and, (of a market) with few participants and a low volume of activity.

Mr. Bletzacker does believe that parties can enter into a NYMEX natural gas futures (purchase or sell) contract during periods of little or no open interest but, depending on the quantity attempting to be bought (or sold), the actual transaction price may be significantly different than previous trades (in periods of low open interest) and NYMEX-generated theoretical values (in periods of no open interest).

Ultimately, NYMEX energy-complex futures prices (and associated theoretical values) are not a reliable forecast of future, weather-normalized, long-term energy market prices.

Prepared By: Connie S. Trecuzzi

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**Question No. 2-5:**

Refer to the direct testimony of Karl Bletzacker at page 7. Please explain Mr. Bletzacker's understanding of how monthly NYMEX futures prices are established beyond two years.

**Response No. 2-5:**

There is not a time period (i.e. "beyond two years") that dictates the establishment of NYMEX natural gas futures contract prices (daily settlement prices). According to the CME Group, owner and operator of the NYMEX futures exchange, the daily settlement price can be "Actual" or "Theoretical." Actual daily settlement prices represent actual traded contract values. Theoretical settlement prices are "[a]ny settlement price that is not an actual settlement, often a system-generated price not derived from any fundamental market information." See <https://www.cmegroup.com/confluence/display/EPICSANDBOX/Settlement+Prices>

Prepared By: Connie S. Trecuzzi

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**Question No. 2-6:**

Refer to the direct testimony of Karl Bletzacker at page 7. Please provide the 30-plus year forecasts of each input variable to the Aurora energy market simulation model that develops the Company's gas price forecasts.

**Response No. 2-6:**

The Aurora energy market simulation model does not create the Company's natural gas price forecasts, rather it informs the forecast by providing hourly natural gas consumption (and yearly totals) for every U.S. natural gas-fired electric generator through the iterative process presented in Bletzacker Direct Testimony, page 5). Monthly and annual fuel price inputs to the Aurora model are presented in the Fundamentals Forecasts provided in the workpapers of Karl R. Bletzacker in the Company's response to TIEC 1-9.

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**Question No. 2-7:**

Refer to the direct testimony of Karl Bletzacker at page 11. Please provide the International Energy Agency's 2018 and 2019 Current Policies natural gas price forecasts if available.

**Response No. 2-7:**

Review of the International Energy Agency's ("IEA") website (<https://webstore.iea.org/>) indicates that the 2018 World Energy Outlook is currently available for a fee and the 2019 World Energy Outlook is not yet completed. Neither AEPSC or SWEPCO are subscribers to IEA publications.

Prepared By: Connie S. Trecuzzi

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**Question No. 2-8:**

Refer to the direct testimony of Akarsh Sheilendranath at page 7. Please provide the calculations that support his statement that marginal loss costs mathematically amount to twice the average loss costs.

**Response No. 2-8:**

Please see response to TIEC 2-31(a).

Prepared by: Cecile Bourbonnais  
Prepared by: Sophie Leamon

Title: Research Analyst, The Brattle Group  
Title: Research Analyst, The Brattle Group

Sponsored by: Akarsh Sheilendranath

Title: Senior Associate, The Brattle Group

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**Question No. 2-9:**

Refer to the direct testimony of Akarsh Sheilendranath at page 10. Please explain the basis for assuming that estimated congestion and loss-related costs in 2021-2023 will increase by the implied year-over-year growth rates in the Company’s fundamental price forecasts.

**Response No. 2-9:**

As explained in Mr. Sheilendranath’s direct testimony, congestion and loss-related costs were estimated for each of the Selected Wind Facilities based on the 2024 and 2029 PROMOD simulation results. These PROMOD-based congestion and loss-related costs were then adjusted using the Company’s AURORA-based fundamentals forecasts, to account for the extent to which AURORA prices for SPP Central are higher or lower than SPP’s ITP study-based PROMOD SPP Central prices.

For 2025-2028, it was possible to linearly interpolate congestion and loss-related costs using the PROMOD simulation results for the two available 2024 and 2029 “bookend” simulations years. However, to estimate congestion and loss-related costs outside this band—such as for prior years of 2021 to 2023, no other 2019 ITP Study-based PROMOD models were available. Therefore, Mr. Sheilendranath employed the 2024 PROMOD simulation results, and applied the year-over year growth rate implied in the Company’s AURORA-based fundamental forecasts to extrapolate backward the congestion and loss-related costs for 2021-2023. This assumes that congestion and loss-related costs would increase from 2021 to 2024 proportionally with the increase in market prices forecasted by the Company in its AURORA-based fundamental forecasts.

Prepared by: Cecile Bourbonnais  
Prepared by: Sophie Leamon

Title: Research Analyst, The Brattle Group  
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Sponsored by: Akarsh Sheilendranath

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**Question No. 2-10:**

Refer to the direct testimony of Johannes Pfeifenberger at page 8. Please provide the ABB-developed natural gas price forecasts used in the SPP PROMOD simulations, with all supporting workpapers. Are the ABB-developed forecasts the same as the SPP 2019 Integrated Transmission Planning natural gas price forecast reflected on Figure 4 of Mr. Bletzacker's direct testimony? If the forecasts are not the same, please explain why SPP is using different forecasts.

**Response No. 2-10:**

The chart of natural gas price forecasts (Bletzacker Direct, Figure 4, page 12) reflects the same ABB-developed forecasts [used/contained] in the SPP 2019 Integrated Transmission Plan and referred to in Pfeifenberger Direct Testimony, page 8. Tabular values can be found in OPUC\_2\_10\_Attachment\_1.

Prepared By: Connie S. Trecuzzi

Title: Economic Forecast Analyst Staff

Sponsored By: Karl R. Bletzacker

Title: Dir Fundamental Analysis

Sponsored by: Johannes P. Pfeifenberger

Title: Principal, the Brattle Group

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**Question No. 2-11:**

Refer to the direct testimony of Johannes Pfeifenberger at page 26, Table 3. Please provide the results in the format used in Table 3 if congestion costs and gen-tie costs were weighted 25% / 75% (the opposite of Criterion 5).

**Response No. 2-11:**

See the additional Criterion "OPUC 2-11" column in OPUC 2-11 Attachment 1, which shows the ranked cost of bids if congestion costs and gen-tie costs were weighted by 25% and 75%, respectively, and used in conjunction with the Project Costs.

As shown, under this criterion, the Company's selection of Traverse, Maverick, and Sundance remain the three lowest-cost bids in that order, indicating that the Company's selections are robust across a wide range of criteria, including this requested criterion.

As also shown, based on the requested criterion, the lowest cost 1,500 MW portfolio based on Criterion 1 and Criterion 2, would be 28.1% and 38.3% more expensive than the Selected Wind Facilities' delivered cost.

Prepared by: Akarsh Sheilendranath

Title: Senior Associate, The Brattle Group

Sponsored by: Johannes P. Pfeifenberger

Title: Principal, The Brattle Group

Assessment of Wind Facilities Selection with an additional "25% Congestion/75% Gen-Tie" Selection Criterion

Criterion 1: Project Cost Only		Criterion 2: Project Cost + Congestion		Criterion 3: Project Cost + Gen-Tie		Criterion 4: Project Cost + 50% Congestion + 50% Gen-Tie		Criterion 5: Project Cost + 75% Congestion + 25% Gen-Tie		Criterion OPUC 2-11: Project Cost + 25% Congestion + 75% Gen-Tie	
Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost
2	100%	3*	100%	Traverse (21)	100%	Traverse (21)	100%	Traverse (21)	100%	Traverse (21)	100%
Sundance (17)	121%	2	114%	Maverick (15)	106%	Maverick (15)	102%	Maverick (15)	100%	Maverick (15)	104%
12	126%	1	117%	6	107%	Sundance (17)	106%	Sundance (17)	101%	Sundance (17)	111%
4	129%	Sundance (17)	119%	Sundance (17)	116%	12	113%	1	105%	6	115%
Maverick (15)	132%	Maverick (15)	121%	12	121%	1	115%	12	109%	12	117%
Traverse (21)	133%	Traverse (21)	124%	1	139%	6	121%	4	117%	1	127%
1	133%	4	130%	30	147%	4	129%	2	118%	30	139%
32	135%	33*	130%	4	156%	30	133%	30	126%	4	142%
3*	135%	12	131%	31	180%	2	145%	6	128%	31	168%
29*	160%	34*	141%	2	204%	31	157%	32	138%	2	173%
30	163%	32	146%	32	207%	32	160%	31	146%	32	182%
31	184%	30	149%								
33*	185%	29*	155%								
34*	189%	6	166%								
6	189%	31	168%								
Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%	Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%	Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%	Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%	Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%	Capacity-Wtd Average of Lowest Costs 1,500 MW	100.0%
Capacity-Wtd Average of Selected Wind Facilities	106.5%	Capacity-Wtd Average of Selected Wind Facilities	104.0%	Capacity-Wtd Average of Selected Wind Facilities	101.1%	Capacity-Wtd Average of Selected Wind Facilities	100.0%	Capacity-Wtd Average of Selected Wind Facilities	100.0%	Capacity-Wtd Average of Selected Wind Facilities	100.0%
				Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 1	140.2%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 1	117.9%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 1	108.2%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 1	128.1%
				Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 2	155.3%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 2	123.7%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 2	109.7%	Capacity-Wtd Average of Lowest Cost 1,500 MW in Criterion 2	138.3%

Notes:

\*Unit was disqualified from Company's evaluation based on deliverability.

Named units represent the Company's Selected Wind Facilities.

Lowest Cost 1,500 MW in each ranking are highlighted blue.

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**Question No. 2-12:**

Refer to the direct testimony of Johannes Pfeifenberger at page 36. Please explain if the relative project rankings would have been affected if the congestion hedges were considered in the congestion cost and risk analysis during the RFP bid evaluation. If so, explain how.

**Response No. 2-12:**

The table in OPUC 2-12 Attachment 1 shows the relative project rankings had an assumed 25% congestion hedge been considered to offset estimated congestion costs for each RFP bid analyzed in the RFP bid evaluation analysis. Note, however, that congestion hedges likely would be unavailable for any RFP responses in locations that failed the Company's deliverability analysis.

As shown in the attachment, the assumed 25% congestion hedge (applied to each bid regardless of deliverability) would not have affected the relative project rankings. The left panel of the table in Attachment 1 shows the relative project rankings under the Company's bid selection criterion assuming no congestion hedge (i.e., Criterion 4 in Table 3 of the direct testimony of Johannes Pfeifenberger), while the right panel illustrates the relative projected rankings if the 25% congestion hedges are assumed for each wind facility in the RFP bid evaluation.

Prepared by: Johannes P. Pfeifenberger

Title: Principal, the Brattle Group

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### Assessment of Wind Facilities Selection with and without 25% Congestion Hedge

Company Bid Selection Criterion <i>without</i> Hedge (50% Congestion/50% Gen-Tie)		Company Bid Selection Criterion <i>with</i> Hedge (50% Congestion with Hedge/50% Gen-Tie)	
Bid Number	% of Lowest Cost	Bid Number	% of Lowest Cost
<b>Traverse (21)</b>	100%	<b>Traverse (21)</b>	100%
<b>Maverick (15)</b>	102%	<b>Maverick (15)</b>	102%
<b>Sundance (17)</b>	106%	<b>Sundance (17)</b>	106%
12	113%	12	112%
1	115%	1	117%
6	121%	6	121%
4	129%	4	130%
30	133%	30	134%
2	145%	2	146%
31	157%	31	158%
32	160%	32	161%