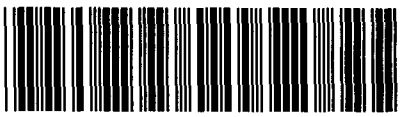

Control Number: 49737

Item Number: 42

Addendum StartPage: 0

PUC DOCKET NO. 49737

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APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR CERTIFICATE OF CONVENIENCE AND NECESSITY AUTHORIZATION AND RELATED RELIEF FOR THE ACQUISITION OF WIND GENERATION FACILITIES	§ § § § § § §	PUBLIC UTILITY COMMISSION OF TEXAS

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SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

AUGUST 14, 2019

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TIEC_2-2_Attachment_1_SWEPCO_P95_Low_NoCO2.xlsx

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-1:

Please provide workpapers showing the derivation of the revenue requirement for each of the proposed wind facilities.

Response No. TIEC 2-1:

See Company witness Torpey's workpapers provided on the PUCT interchange in this docket as item number 5. Revenue Requirement inputs and the calculations are located in the file "AEP Witness Torpey Benefits Model Final." The "P50 RR Base" worksheet aggregates the various components of the wind revenue requirement. Separate calculations of revenue requirements for each facility individually were not prepared.

Prepared By: James F. Martin	Title: Regulatory Case Mgr
Prepared By: Jacob A. Miller	Title: Regulatory Consultant Sr
Sponsored By: John O. Aaron	Title: Dir Reg Pricing & Analysis
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-2:

Please provide an NPV evaluation of the guarantees case assuming Low Gas, No CO2.

Response No. TIEC 2-2:

The Company believes that the chance of the combination of the Low Gas, No CO2 guarantees (P95) case occurring over either the 10 year guarantee period or the 30 year analysis period is remote, which is why it wasn't prepared and included in the Company's filing. The P95 level of production assumed in this case only has a 5% chance of occurring over any 5 year block of time and an even smaller chance over six 5 year blocks of time in a row. Production is just as likely to occur at the P5 level as it is at the P95 level. The requested case would assume no CO2 legislation is enacted at any time between now and 2051, the extremely low power prices in the Low Gas, No CO2 case are sustained for the 10 year guarantee period and through 2051, and the P95 level of production occurs for expected periods of time. The average generation weighted around the clock power price in the first 5 years of this case is only $25.25 and the first 10 years is only $27.63. By comparison, day-ahead and real-time prices in SPP both averaged approximately $25/MWh for the year in 2018.
Source: SPP State of the Market Report:
https://www.spp.org/documents/59861/2018%20annual%20state%20of%20the%20market%20report.pdf

Notwithstanding these issues, for the purpose of responding to this request, the Company is preparing an estimate of what that case would look like by using simplifying assumptions and numbers from other cases which would be the same in this case. As stated in the Company's response to TIEC 1-19, the Company is reviewing a portion of its analysis which may lead to updated/supplemental new workpapers for Company witness Torpey's economic benefit analysis. Once this review is complete this response will be supplemented with the requested information.

Prepared By: Jon R. Maclean — Title: Resource Planning Mgr

Prepared By: James F. Martin — Title: Regulatory Case Mgr

Sponsored By: John F. Torpey — Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-3:

Would SWEPCO agree to not exclude curtailments from its energy production guarantee? If not, please explain why not.

Response No. TIEC 2-3:

SWEPCO continues to support the capital cost, PTC eligibility, and minimum production guarantees described in the Direct Testimonies of Company witnesses Brice and Smoak, because these are reasonable guarantees to provide in the context of this case.

Prepared By: Christopher N. Martel — Title: Regulatory Consultant Sr

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-4:

Please explain why SWEPCO limited the RFP to build-own-transfer projects and did not request proposals for wind purchase power agreements (PPAs). Please provide all analyses, presentations, and internal correspondence regarding SWEPCO's decision to pursue build-own-transfer projects instead of PPAs.

Response No. TIEC 2-4:

The information responsive to this request is CONFIDENTIAL under the terms of the Protective Order. The Confidential information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

As discussed on pages 13-14 of the Direct Testimony of Company witness Brice, ownership of wind generating facilities will provide several benefits to the Company and its customers, as compared to adding more wind PPAs. For example, ownership enables the Company to respond to changes in the market, to effectively manage congestion risk, to potentially run the facilities beyond their estimated useful life, and to offer the guarantees described by Company witnesses Brice and Smoak.

Subject to the Company's previously-filed privilege objection, documents responsive to this request are provided in TIEC 2-4 Confidential Attachment 1.

Prepared By: Joseph A. Karrasch	Title: Dir Renewable Energy Devlpmnt
Prepared By: Edward J. Locigno	Title: Regulatory Analysis & Case Mgr
Prepared By: Christopher N. Martel	Title: Regulatory Consultant Sr
Prepared By: Jonathan M. Griffin	Title: Regulatory Consultant Staff
Sponsored By: Thomas P. Brice	Title: VP Regulatory & Finance
Sponsored By: Jay F. Godfrey	Title: VP Energy Mktng & Renewables

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-5:

Does SWEPCO agree that tax equity investors would be more likely to efficiently monetize the wind production tax credits (PTCs) generated by the proposed wind projects than AEP? If not, why not?

Response No. TIEC 2-5:

SWEPCO believes that although tax equity investors may be more likely to efficiently monetize the wind production tax credits generated by the proposed wind projects, using a tax equity structure would subject customers to a higher cost of capital. In addition, the use of a tax equity structure would add legal, ownership, financial and tax complexity to the project. SWEPCO has the ability to access capital and fund this project at its weighted average cost of capital which is lower than a tax equity structure that would require the project to be financed with 100% equity while avoiding the complexity and risk associated with a tax equity structure.

Prepared By: Renee V. Hawkins — Title: Mng Dir Corporate Finance

Prepared By: Carrie M. Luedtke — Title: Corp Finance Analyst Prin

Sponsored By: Noah K. Hollis — Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-6:

Has SWEPCO considered a structure that would more efficiently monetize the wind PTCs, such as the joint venture structure that Northern Indiana Public Service Company (NIPSCO) has proposed for its Rosewater Wind Project? If not, why not?

Response No. TIEC 2-6:

The Company is familiar with the tax equity structure proposed for NIPSCO's Rosewater Wind Project. However, the Company did not consider the use of tax equity for the wind facilities proposed in this proceeding for the reasons stated in the response to TIEC 2-5.

Prepared By: Renee V. Hawkins — Title: Mng Dir Corporate Finance

Prepared By: Carrie M. Luedtke — Title: Corp Finance Analyst Prin

Sponsored By: Noah K. Hollis — Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-7:

Please provide the NPV benefit analysis for the case where only 810 MW of the Traverse facility is approved.

Response No. TIEC 2-7:

As stated in the Company's response to TIEC 1-19, the Company is reviewing a portion of its analysis which may lead to updated/supplemental workpapers for Company witness Torpey's economic benefit analysis. Once this review is complete the response to this request will be supplemented with the requested information.

Prepared By: Jon R. Maclean	Title: Resource Planning Mgr
Prepared By: James F. Martin	Title: Regulatory Case Mgr
Sponsored By: Jay F. Godfrey	Title: VP Energy Mktng & Renewables
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-8:

Please provide all forecasts made in the last three years of the basis differential from Henry Hub to SWEPCO's plants.

Response No. TIEC 2-8:

The information responsive to this request is CONFIDENTIAL under the terms of the Protective Order. The Confidential information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

The Company's Fundamentals Forecasts (TIEC_1_009) provide the forecast of basis differentials from Henry Hub to SPP Central (represented by Panhandle Eastern Pipeline; Texas/Oklahoma). Annual basis differentials can be derived from Henry Hub natural gas prices and the locational natural gas prices in SPP Central in the Excel worksheet "Annual_Prices-Nominal" (column AE minus column Z).
TIEC_2-8_Confidential_Attachment_1.xlsx provides the basis and incremental transport costs for the forward price forecasts prepared during the requested time period.

Prepared By: Jon R. Maclean — Title: Resource Planning Mgr

Prepared By: Connie S. Trecazzi — Title: Economic Forecast Anlyst Staff

Sponsored By: Karl R. Bletzacker — Title: Dir Fundamental Analysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-9:

Please explain why AEP believes that it is a reasonable assumption that congestion costs will not increase consistent with the increase in power prices after 2029.

Response No. TIEC 2-9:

Holding congestion and loss-related costs constant assumes that in the long-run, if congestion costs were to increase as dispatch costs increase, new transmission upgrades will become cost-effective, meaning that SPP's planning process will advance cost-effective transmission solutions to address transmission congestion. Additionally, costs of substitute technologies, such as battery storage, co-located solar/wind and storage, are continuing to decrease, which is expected to reduce the future costs of addressing transmission congestion. As a result, holding 2029 congestion constant in nominal dollar terms was viewed as a reasonable assumption. If, in fact, congestion were to increase beyond the assumed levels (as is approximated by the higher congestion levels in the "No SPP Upgrade" case), AEP will be able to mitigate the higher congestion costs, for example, by cost-effectively constructing a gen tie—as is evaluated by Company witness Torpey in the gen tie cases.

Prepared By: Cecile Bourbonnais — Title: Research Analyst, The Brattle Group

Prepared By: Sophie Leamon — Title: Research Analyst, The Brattle Group

Sponsored by: Akarsh Sheilendranath — Title: Senior Associate, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-10:

Did AEP perform any analyses wherein it assumed that congestion costs will increase with power prices after 2029? If so, please provide any such analyses. If not, please explain why that is an unreasonable assumption.

Response No. TIEC 2-10:

No. Please see response to TIEC 2-9.

Prepared By: Cecile Bourbonnais — Title: Research Analyst, The Brattle Group

Prepared By: Sophie Leamon — Title: Research Analyst, The Brattle Group

Sponsored By: Akarsh Sheilendranath — Title: Senior Associate, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-11:

Does AEP use a hurdle rate for any investment decisions outside of regulated utility planning? If yes, please provide those hurdle rates and the purposes for which they are used.

Response No. TIEC 2-11:

No, AEP does not use a hurdle rate to evaluate each investment outside of regulated utility planning. Each project outside of regulated planning bears unique risk and benefit characteristics coupled with unique financial and operational project structures that are reviewed for their own merit, making it difficult to measure against a specific hurdle rate.

Prepared By: Renee V. Hawkins — Title: Mng Dir Corporate Finance

Prepared By: Carrie M. Luedtke — Title: Corp Finance Analyst Prin

Sponsored By: Noah K. Hollis — Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-12:

Does AEP use a spread option model for evaluating unregulated power opportunities, such as the 88 MW portion of the Turk Plant that is not in rate base? If so, please provide the forward gas prices, forward electric prices, and discount rates used in such modeling

Response No. TIEC 2-12:

Yes. See the response to TIEC 1-009. The forward prices used in the spread option model are the same AEP Fundamentals Forecast prices used in this proceeding. The discount rate used in the spread option model is the same discount rate used in this proceeding and is identified on page 5 of Company witness Hollis' testimony.

Prepared By: Jon R. Maclean Title: Resource Planning Mgr

Sponsored By: John F. Torpey Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-13:

Please explain the basis of AEP's assumption that the proposed wind facilities will have a 30 year life. Please explain whether AEP is expecting to make capital expenditures for maintenance, such as blade replacement, during the life of the proposed wind facilities.

Response No. TIEC 2-13:

The information responsive to this request is HIGHLY SENSITIVE under the terms of the Protective Order. The Highly Sensitive information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

Company witness DeRuntz discusses the Selected Wind Facilities' design life at pages 18-19 of his direct testimony.
A 30-year design life was a requirement included in Section 4.1 and Appendix E (AEP Wind Generation Facility Standards) of the RFP. The RFP is included as Exhibit JFG-1 to Company witness Godfrey's direct testimony. The Company also required that proposals include a Turbine Specific Site Suitability Report, which is a Mechanical Loads Analysis (MLA) for GE turbines, in Sections 3.8 and 9.1.11 of the RFP. Please see TIEC 2-13 Highly Sensitive Attachments 1 through 3 for the MLAs for the Selected Wind Facilities that support the 30-year design life.
As described in the direct testimony of Company witness DeRuntz at page 17, the Company does expect to make capital expenditures for Major Maintenance Activities (e.g. blade or gearbox replacements) during the life of the Selected Wind Facilities . An estimate of these costs (Major Maintenance/Other Parts) for each of the Selected Wind Facilities is included in the Company's ongoing O&M and Capital forecast in Exhibit JGD-5.

Prepared By: Joseph A. Karrasch — Title: Dir Renewable Energy Devlpmnt

Prepared By: Edward J. Locigno — Title: Regulatory Analysis & Case Mgr

Sponsored By: Joseph G. DeRuntz — Title: Director - Projects

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-14:

Please explain the basis of AEP's assumption in its economic evaluation of the wind projects that there will not be any degradation in wind output.

Response No. TIEC 2-14:

The economic evaluation completed by the Companies used 30-year levelized values for annual wind farm output of each facility sourced from the wind energy resource assessments conducted by Simon Wind (Exhibit JFG-6). The levelized values contain loss assumptions for several factors including Turbine Availability and Blade Degradation and Soiling. For the loss assumption details, please see Exhibit JFG-6 at page 54 (Traverse), page 105 (Maverick), and page 200 (Sundance).

Prepared By: Joseph A. Karrasch — Title: Dir Renewable Energy Devlpmnt

Prepared By: Edward J. Locigno — Title: Regulatory Analysis & Case Mgr

Sponsored By: Jay F. Godfrey — Title: VP Energy Mktng & Renewables

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-15:

Will SWEPCO provide a guarantee on the amount of future capital expenditures and O&M expense for the wind facilities? If yes, please provide the level of guarantee that SWEPCO is willing to provide. If not, please explain why not.

Response No. TIEC 2-15:

SWEPCO continues to support the capital cost, PTC eligibility, and minimum production guarantees described in the Direct Testimonies of Company witnesses Brice and Smoak, because these are reasonable guarantees to provide in the context of this case.

Prepared By: Christopher N. Martel — Title: Regulatory Consultant Sr

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-16:

What percentage of the NPV of the projected revenue requirement for the wind facilities is comprised of O&M expense and, separately, future capital expenditures?

Response No. TIEC 2-16:

The total NPV of the revenue requirement per line 6 of page 1 of Exhibit JFT 3 is $1,348 million. The NPV of SWEPCO's O&M is $157M, or 11.7% of the revenue requirement.
The NPV of the future capital expense would be the NPV of the 30 years of depreciation expense, plus the return on the rate base. Rate Base, which would be the future capital invested offset by accumulated depreciation and accumulated deferred income taxes, has not been separately computed so a return on that is not available.
The benefits model assumes all the future capital over the 31 year life of the facilities is all fully depreciated by 2051. The NPV of the depreciation expense is $57 million, or 4% of the revenue requirement NPV.

Prepared By: James F. Martin	Title: Regulatory Case Mgr
Prepared By: Jacob A. Miller	Title: Regulatory Consultant Sr
Sponsored By: John O. Aaron	Title: Dir Reg Pricing & Analysis
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-17:

Has SWEPCO undertaken any studies of the increased O&M expense from having to cycle its fossil fuel units as a result of having 26% of its energy needs provided by the wind facilities? If yes, please provide any such studies. If not, please explain why not.

Response No. TIEC 2-17:

No studies of fossil fuel unit cycling and associated O&M changes were performed. As described on page 21 of the Direct Testimony of Company witness Torpey, the addition of the new wind resources is not expected to have a significant impact on SPP market energy prices, under the assumption that the additional wind facilities will be built in SPP regardless of SWEPCO ownership. Thus it was assumed that the addition of new wind resources to the Company's fleet does not directly affect the dispatch of other Company-owned units, because they are dispatched based on SPP market conditions, not based on the Company's load.

Prepared By: Christopher N. Martel	Title: Regulatory Consultant Sr
Prepared By: James F. Martin	Title: Regulatory Case Mgr
Prepared By: Jonathan M. Griffin	Title: Regulatory Consultant Staff
Sponsored By: Thomas P. Brice	Title: VP Regulatory & Finance
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-18:

Will SWEPCO provide a guarantee that its fossil fuel O&M expenses will not increase due to having to cycle its fossil fuel units as a result of the wind projects? If yes, please provide the level of guarantee that SWEPCO is willing to provide. If not, please explain why not.

Response No. TIEC 2-18:

SWEPCO continues to support the capital cost, PTC eligibility, and minimum production guarantees described in the Direct Testimonies of Company witnesses Brice and Smoak, because these are reasonable guarantees to provide in the context of this case.

Prepared By: Christopher N. Martel — Title: Regulatory Consultant Sr

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-19:

Referring to SWEPCO's assumption that 25% of congestion can be eliminated from the cost/benefit analysis through the use of transmission credit rights (TCRs):
a. Please explain how transmission congestion rights are provided and allocated in SPP.
b. How are congestion rents apportioned between loads and congestion rights holders in SPP?
c. Is there an opportunity cost associated with TCRs?

Response No. TIEC 2-19:

a, Market Participants ("MPs") in SPP obtain Transmission Congestion Rights (TCRs) for hedging against congestion charges by converting Auction Revenue Rights (ARRs) they hold directly to TCRs. ARRs are allocated to MPs based on their Firm Transmission Service Agreements.
b. Congestion rents are first paid, or charged, to TCR holders based upon the differences in Day Ahead Market congestion components associated with the TCR. Once all TCR holders have been paid fully for their TCR value, any remaining excess funds are distributed back to ARR holders pro-rata based upon their annual ARR Nomination Caps.
c. No, there is no opportunity cost for TCRs secured by converting ARRs.

Prepared By: Anita A. Sharma Title: Engineer Staff

Sponsored By: Kamran Ali Title: Mng Dir Trans Planning

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-20:

Please provide all investor presentations made in the last two years by AEP.

Response No. TIEC 2-20:

Please refer to AEP.com / Investors / Events and Presentations, which provides access to all past investor presentations. https://www.aep.com/investors/events

Prepared By: Renee V. Hawkins — Title: Mng Dir Corporate Finance

Prepared By: Carrie M. Luedtke — Title: Corp Finance Analyst Prin

Sponsored By: Noah K. Hollis — Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-21:

Please provide all presentations made to ratings agencies in the last two years by AEP.

Response No. TIEC 2-21:

The information responsive to this request is CONFIDENTIAL under the terms of the Protective Order. The Confidential information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

Please refer to attached zip file TIEC_2_021_Confidential_Attachment_1

Prepared By: Darcy L. Reese Title: Dir Investor Relations

Sponsored By: Noah K. Hollis Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-22:

Please provide all analyst reports on AEP stock from the last two years.

Response No. TIEC 2-22:

The information responsive to this request is CONFIDENTIAL under the terms of the Protective Order. The Confidential information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

Please refer to TIEC 2-22 Confidential Attachments 1-3 for equity analyst reports for the last two years.

Prepared By: Darcy L. Reese Title: Dir Investor Relations

Sponsored By: Noah K. Hollis Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-23:

Please provide all documents from the last two years discussing AEP and SWEPCO executive compensation plans.

Response No. TIEC 2-23:

The information responsive to this request is CONFIDENTIAL and/or HIGHLY SENSITIVE under the terms of the Protective Order. The Highly Sensitive information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

By agreement with TIEC, TIEC has limited the scope of this question to only include (1) executive compensation plan documents (i.e., documents setting forth the plans) and (2) documents summarizing executive compensation disbursements.

Please see TIEC_2_23_Highly_Sensitive_Attachment_1, TIEC_2_23_Highly_Sensitive_Attachment_2, TIEC_2_23_Confidential_Attachment_3, TIEC_2_23_Confidential_Attachment_4, and TIEC_2_23_Confidential_Attachment_5.

Prepared By: Cheryl L. Strawser — Title: Comp&Exec Benefits Consultant

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-24:

Please provide SWEPCO's capital spending plan with and without the wind projects.

Response No. TIEC 2-24:

The information responsive to this request is CONFIDENTIAL under the terms of the Protective Order. The Confidential information is available for review at the Austin offices of American Electric Power Company (AEP), 400 West 15th Street, Suite 1520, Austin, Texas, 78701, (512) 481-4562, during normal business hours.

SWEPCO's 2019 capital budget is attached as TIEC_2_24_Confidential_Attachment_1.xls.

SWEPCO does not have a capital spending plan with the North Central Energy Facilities included.

Prepared By: Christopher N. Martel — Title: Regulatory Consultant Sr

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-25:

Please provide SWEPCO's financial forecasts with and without the wind projects.

Response No. TIEC 2-25:

Please refer to TIEC_2_24_Confidential_Attachment_1.xls for SWEPCO's 2019 capital budget. The Company's financial forecast does not include the wind facilities proposed in this proceeding.

Prepared By: Christopher N. Martel — Title: Regulatory Consultant Sr

Prepared By: Jonathan M. Griffin — Title: Regulatory Consultant Staff

Sponsored By: Thomas P. Brice — Title: VP Regulatory & Finance

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-26:

Has SWEPCO conducted an analysis of the cost of imputed debt if it purchases wind through PPAs instead of owning a similar amount of wind? If so, please provide any such analyses.

Response No. TIEC 2-26:

No. Purchased Power Agreements were not contemplated within the context of the Request for Proposal, so no debt imputation was calculated. See also the Company's response to TIEC 2-4.

Prepared By: Renee V. Hawkins — Title: Mng Dir Corporate Finance

Prepared By: Carrie M. Luedtke — Title: Corp Finance Analyst Prin

Sponsored By: Noah K. Hollis — Title: Corp Finance Mgr

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-27:

Has SWEPCO ever quantified the value of fuel diversity? If so, please provide any such quantifications. If not, how does SWEPCO evaluate how much and what type of fuel diversity it needs, and how much to spend on fuel diversity?

Response No. TIEC 2-27:

Through its Integrated Resource Planning (IRP) process, SWEPCO evaluates various generating technologies to meet its SPP capacity obligation and energy needs, to provide a plan at least reasonable cost to its customers. Each technology includes estimates of its total cost and performance characteristics. Within the IRP model these are evaluated to a least cost plan. Various plans are developed based on varying load and commodity price forecasts and potentially other factors. For example, the Company may constrain the selection of a natural gas fired combined cycle to see what the model picks when this technology is not available.
In general, when the Company can diversify its fuel mix and lower cost to customers this is a relatively clear decision, due to the benefit that is provided by relying upon more than one, single fuel type. However, if diversifying its fuel mix will raise cost to customers, SWEPCO assesses whether there are any additional benefits to associate with the "diverse" addition to rationalize the additional cost. For example, this may include improved reliability over the non-diverse alternative due to the location on the grid or technology characteristics, such as fast responding battery storage versus a natural gas combustion turbine.

Prepared By: Christopher N. Martel	Title: Regulatory Consultant Sr
Prepared By: Jonathan M. Griffin	Title: Regulatory Consultant Staff
Sponsored By: Thomas P. Brice	Title: VP Regulatory & Finance
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-28:

Please provide AEP's most recent estimates of the capital and O&M costs of: (1) generic wind projects in Oklahoma, (2) solar projects in the SWEPCO or PSO territory, and (3) new CCGT and SCGT facilities in the SWEPCO territory.

Response No. TIEC 2-28:

See TIEC_2_028_Attachment_1.

Prepared By: Joseph A. Karrasch	Title: Dir Renewable Energy Devlpmnt
Prepared By: Edward J. Locigno	Title: Regulatory Analysis & Case Mgr
Prepared By: Jon R. Maclean	Title: Resource Planning Mgr
Prepared By: James F. Martin	Title: Regulatory Case Mgr
Sponsored By: Joseph G. DeRuntz	Title: Director - Projects
Sponsored By: Jay F. Godfrey	Title: VP Energy Mktng & Renewables
Sponsored By: John F. Torpey	Title: Mng Dir Res Plnning&Op Anlysis

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-29:

Did AEP ever run its calculated breakeven gas price through its PROMOD/Aurora/PLEXOS modeling to verify that the calculated breakeven gas price is correct?

Response No. TIEC 2-29:

No. The Company believed the correct approach was to divide the Company-specific break-even power prices by the Aurora-generated implied heat rates to produce the break-even natural gas price curve which is similarly shaped to the Company's Henry Hub forecasts as illustrated in Figure 5, page 14, of Bletzacker Direct Testimony.

Prepared By: Connie S. Trecazzi Title: Economic Forecast Anlyst Staff

Sponsored By: Karl R. Bletzacker Title: Dir Fundamental Analysis

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SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-30:

Please provide all workpapers showing the modifications in power prices made between the PROMOD/Aurora/PLEXOS models for the Base Gas No CO2 and Low Gas No CO2 cases.

Response No. TIEC 2-30:

These calculations were performed in the publicly available programming software package, "R". The R program code performing these modifications was already provided as part of workpaper "Sheilendranath WP1b - R Code_With Outputs" file. The code files provided are named "02_Base Case LMP Calculations.R" and "03_No SPP Upgrade Case LMP Calculations.R". As explained in the "Explanation of Code.pdf", the two code files calculate 2019-2051 Aurora-Adjusted LMPs using the PROMOD "Base Case" and the PROMOD "No SPP Upgrade Case", respectively. For each PROMOD case, the results for the Base Gas/No CO_2 and Low Gas/No CO_2 scenarios are outputted to "Base Case Base_Adjusted_LMPs.csv" and "Base Case LowNoC_Adjusted_LMPs.csv" files. These adjusted-AURORA prices are then used in the Company's PLEXOS models to compute the customer benefits.

Prepared By: Cecile Bourbonnais — Title: Research Analyst, The Brattle Group

Prepared By: Sophie Leamon — Title: Research Analyst, The Brattle Group

Sponsored by: Akarsh Sheilendranath — Title: Senior Associate, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-31:

Referring to page 7 of the Direct Testimony of Akarsh Sheilendranath:
a. Please provide the basis for the statement that average losses are approximately 50% of marginal losses in SPP.
b. Please explain the allocation of the refund of the amount between average losses and marginal losses.

Response No. TIEC 2-31:

a. Transmission loss costs in SPP are assessed according to marginal loss factors. Marginal loss factor at a pricing node reflects the percent increase in total transmission system losses for an incremental increase in power injected or withdrawn at that node. From the electrical definition, transmission line losses are directly proportional to the square of the power flow on the line. That is:

Transmission Loss = aP^2 (where"a" is a constant and "P" is the total power flow on the line)

Marginal Loss, which is calculated as the change in line loss for an incremental change in power flow on the line, is:

$$\partial(aP^2)/\partial P = 2aP$$

The average loss on the line is equal to: Total Line Loss / Total Power Flows, i.e.

$$\text{Average Loss} = aP^2/P = aP$$

Mathematically, marginal losses thus are twice the average transmission losses, as shown. Because SPP charges Asset Owners on marginal cost basis, it over-collects transmission loss-related costs. The difference (50%) is refunded by SPP.

b. SPP refunds the over-collection via its tariff based Over-Collection of Losses (OCL) Distribution Charge methodology. In this methodology, SPP calculates the Over-Collected Losses Distribution Amount for each hour at each Settlement Location for which an Asset Owner has a net energy withdrawal within an SPP-defined Loss Pool, provided that Loss Pool contributed positively to the Over-Collected Losses. SPP calculates a Loss Pool's contribution to OCL based on actual load consumption, actual energy production and import and export interchange transactions within the Loss Pool. See SPP's OATT Sixth Revised Volume No. 1,

section 8.6.16, for additional details regarding how SPP determines the OCL distribution amount allocable to each Asset Owner.

Prepared By: Cecile Bourbonnais	Title: Research Analyst, The Brattle Group
Prepared By: Sophie Leamon	Title: Research Analyst, The Brattle Group
Sponsord by: Akarsh Sheilendranath	Title: Senior Associate, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-32:

Referring to page 12 of the Direct Testimony of Akarsh Sheilendranath, where Mr. Sheilendranath states that the "No Upgrade" case contains one upgrade for a line west of Tulsa, did AEP ever run a "No Upgrade" case without that upgrade? If so, please provide any such analyses. If not, please explain why this single upgrade should be assumed to be made in the "No Upgrade" case.

Response No. TIEC 2-32:

No, the Company did not run a "No Upgrade" case without the upgrade for the line west of Tulsa, namely, the Cleveland 138 kV bus-tie. The Company assumed that the Cleveland 138 kV bus-tie will be addressed by a SPP solution in the near term since it was identified as both an economic and operational need in SPP's 2019 ITP Study and the transmission upgrade costs are expected to be low. SPP studies to evaluate solutions to address the 2019 ITP identified needs are currently underway and a project to upgrade terminal equipment on the Cleveland 138kV bus-tie to increase the rating of the bus-tie is under consideration as a potential solution. The Cleveland 138kV bus-tie upgrade costs are estimated to be approximately $2.5M.

Prepared By: Anita A. Sharma Title: Engineer Staff

Sponsored By: Kamran Ali Title: Mng Dir Trans Planning

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-33:

Please confirm that the congestion analysis is based on SPP ITP PROMOD runs. If not confirmed, please explain why not.

Response No. TIEC 2-33:

As stated on p. 6 of the Direct Testimony of Akarsh Sheilendranath, the congestion analysis was based on SPP's stakeholder-developed 2019 Integrated Transmission Planning (2019 ITP) PROMOD models and assumptions. The congestion analysis is based on the Company's PROMOD runs that use these SPP ITP assumptions with some study-related modifications as explained in the testimonies of witnesses Sheilendranath and Pfeifenberger.

Prepared By: Cecile Bourbonnais — Title: Research Analyst, The Brattle Group

Prepared By: Sophie Leamon — Title: Research Analyst, The Brattle Group

Sponsored by: Akarsh Sheilendranath — Title: Senior Associate, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-34:

Referring to page 5 of the Direct Testimony of Kamran Ali, where Mr. Ali states that congestion and curtailment risk is understated by PROMOD. Please provide the basis for this statement and any studies which support it or quantify how much PROMOD understates congestion and curtailment risk.

Response No. TIEC 2-34:

As Mr. Ali explains on page 5 of his testimony, congestion and curtailment risk is understated in PROMOD for a number of reasons:

- PROMOD is simulating a perfect day-ahead market under normalized and perfectly predictable load and system conditions.
- In PROMOD simulations, demand is normal and known for every hour, the transmission system does not encounter any outages, and the outage and generation schedule of all generating units is known in advance for the entire year along with their associated energy market bids.
- In real-time operations, however, conditions are not perfectly predictable, multiple transmission lines may be out of service at any given time, generation outages are not all predictable, wind and solar profiles may vary from their forecasts, and demand may be much higher or lower than normal.
- Furthermore, considering the number of computational parameters that a tool such as PROMOD can simulate to produce results, the number of flow gates (pairs of monitored elements and contingencies) is necessarily limited to a very small number compared to potential contingencies that could actually occur and result in system constraints. As a result, not all real-world events and their impacts are evaluated (which is also why a threshold deliverability analysis needs to be performed in addition to PROMOD simulations to more fully understand the risk of congestion and curtailment).

Mr. Pfeifenberger similarly explains this point on in his testimony (see page 5 line 15 through page 6 line 5), stating:

> "The PROMOD simulations, like those of similar other nodal market simulations, make certain simplified assumptions about market conditions that tend to yield conservatively low market price fluctuations and congestion levels. For example, PROMOD simulations generally use long-term projections of fuel prices (which do not have as much daily and monthly volatility as actual fuel prices), weather-normalized loads (which do not include occasional heat waves or unusual cold weather), and a fully intact transmission system (i.e., no temporary transmission outages). Thus, the simulations do not capture the actual daily or

monthly fluctuations in these variables, nor the added stresses associated with the encountered more challenging system conditions. The simulations are based on perfect foresight of daily real-time conditions—which approximates day-ahead power markets but understates real-time market uncertainties, including variances in wind generation output and therefore the likely generation curtailment driven by the uncertainty of real-time market conditions and temporary transmission outages."

See also the discussion of the limitations of production cost simulations in Chang, Pfeifenberger, and Hagerty, The Benefits of Electric Transmission: Identifying and Analyzing the Value of Investments, July 2013, pages 35-46.[1]

PROMOD's assumption of a fully intact transmission system is perhaps the most intuitive reason for why the simulations tend to understate congestion and curtailments. By assuming that transmission facilities are available 100 percent of the time, the simulation analyses tend to under□estimate both congestion and curtailments. This is because outages, when they occur, typically cause transmission constraints to bind more frequently and increase transmission congestion and the associated customer costs significantly. For example, a 2005 study of PJM assessed the impact of transmission outages. That analysis showed that without transmission outages, total PJM congestion charges would have been 20 percent lower; the value of FTRs from the AEP Generation Hub to the PJM Eastern Hub would have been 37 percent lower; the value of FTRs into Atlantic Electric, for example, would have been more than 50 percent lower; and that simulations without outages generally understated prices in eastern PJM load zones and overall west-east price differentials.[2]

Similarly, uncertainties associated with load, generation, and outages can impose additional costs during unexpected real-time conditions, including over-generation conditions that impose additional congestion costs. For example, comparing the number of negatively priced hours in the real-time versus the day-ahead markets in the ComEd load zone of PJM provides an example of how dramatically load and intermittent resource conditions can change. From 2008 to 2010, there were 763 negatively priced hours in the real-time market, but only 99 negatively priced hours in the day-ahead market. The increase in negative prices in the real-time, relative to the day-ahead, market is due to the combined effects of lower-than-anticipated loads with the significantly higher-than-predicted output of intermittent wind resources. While this example illustrates the impact of uncertainties within the day-ahead time frame, traditional production cost simulations approximate day-ahead conditions (i.e., perfect foresight) and consequently do not consider these uncertainties and their impacts.[3]

[1] Available at: https://brattlefiles.blob.core.windows.net/files/6257_the_benefits_of_electric_transmission_-_identifying_and_analyzing_the_value_of_investments_chang_pfeifenberger_hagerty_jul_2013.pdf.
[2] Id., pp. 37-39.
[3] Id., p. 41.

Prepared By: Anita A. Sharma Title: Engineer Staff

Sponsored by: Johannes P. Pfiefenberger Title: Principal, The Brattle Group

PUC DOCKET NO. 49737

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' SECOND REQUEST FOR INFORMATION

Question No. TIEC 2-35:

Has SWEPCO purchased TCRs in the past? If so, how many and at what cost?

Response No. TIEC 2-35:

SWEPCO has not purchased any TCR's for Congestion Hedging in the past. As also explained in the response to TIEC 2-19, SWEPCO secures its TCR's by requesting ARR's based on its Firm Transmission Service Agreement and, once secured, converting those ARR's to TCR's through SPP's market operations.

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