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Witness: Michael L. Stahlman
Sponsoring Party: MO PSC Staff
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MISSOURI PUBLIC SERVICE COMMISSION

REGULATORY REVIEW DIVISION

REBUTTAL TESTIMONY

OF

MICHAEL L. STAHLMAN

GRAIN BELT EXPRESS CLEAN LINE LLC

CASE NO. EA-2014-0207

Jefferson City, Missouri
September 201414

** Denotes Highly Confidential Information **

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BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing It to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood - Montgomery 345 kV Transmission Line	)))))))))	Case No. EA-2014-0207

AFFIDAVIT OF MICHAEL L. STAHLMAN

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Michael L. Stahlman, of lawful age, on his oath states: that he has participated in the preparation of the following Rebuttal Testimony in question and answer form, consisting of 18 pages of Rebuttal Testimony to be presented in the above case, that the answers in the following Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Michael L. Stahlman

Subscribed and sworn to before me this 12th day of September, 2014.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 03, 2014
Commission Number: 10942086

Notary Public

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OF

MICHAEL L. STAHLMAN

GRAIN BELT EXPRESS CLEAN LINE LLC

CASE NO. EA-2014-0207

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REBUTTAL TESTIMONY

OF

MICHAEL L. STAHLMAN

GRAIN BELT EXPRESS CLEAN LINE LLC

CASE NO. EA-2014-0207

Q. Please state your name and business address.

A. My name is Michael L. Stahlman, and my business address is Missouri Public Service Commission, P.O. Box 360, Jefferson City, Missouri, 65102.

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

A. I am employed by the Missouri Public Service Commission ("Commission") as a Regulatory Economist III in the Energy Rate Design & Tariffs Unit, Economic Analysis Section, of the Tariff, Safety, Economic and Engineering Analysis Department in the Regulatory Review Division.

Q. Please describe your educational and work background.

A. Please see Schedule MLS-1.

Q. What is the purpose of your testimony?

A. I will state Staff's understanding of how the proposed transmission line is to operate as proposed in the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity ("Application") and discuss the economic feasibility and the benefits to Missouri.

Staff's Understanding of Grain Belt Express' Project

Q. Please briefly describe Grain Belt Express' transmission project as understood by Staff.

A. Staff cannot confidently describe the parameters for Grain Belt Express' transmission project or the upgrades necessary to support transmission system operation by the PJM Interconnection ("PJM"), the Midcontinent Independent System Operator ("MISO"), or the Southwest Power Pool ("SPP"). There is some indication that the transmission project proposes to connect a high voltage DC line from a 3,756 mega-watt ("MW")[1] converter station in Kansas to a 3,500 MW converter station in eastern Illinois,[2] with a 1,000 MW converter station in Ralls County Missouri, limited to a 500 MW export.[3] However, the responses to Staff Data Request Nos. 0162 and 0163 indicate that the project will have a Kansas converter station with a maximum operational rating of approximately 4300 MW, an approximately 3525 MW converter station near Sullivan, Indiana (i.e. in eastern Illinois), and an approximately 1007 MW converter station in Missouri.

The project also includes a 345 kV AC transmission line that will connect the converter station in eastern Illinois to a point near the Sullivan substation[4] which is capable of stepping-up the voltage to 765 kV in western Indiana;[5] a 345 kV AC transmission line to connect the Missouri converter station to a point on the Maywood-Montgomery[6] 345 kV

[1] Pages 7 of 11 and 8 of 11 in "Application for GRAIN BELT EXPRESS CLEAN LINE LLC" filed on 7/15/2013 in Docket 13-GBEE-803-MIS "In the Matter of the Application of Grain Belt Express Clean Line LLC for a Siting Permit for the Construction of a High Voltage Direct Current Transmission Line in Ford, Hodgeman, Edwards, Pawnee, Barton, Russell, Osborne, Mitchell, Cloud, Washington, Marshall, Nemaha, Brown, and Doniphan Counties Pursuant to K.S.A.66-1,177, et seq."
http://estar.kcc.ks.gov/estar/ViewFile.aspx/20130715113015.pdf?Id=67205ba7-09f7-44e4-ae58-5ddfd5de4957. (22AUG14), See also Schedule AWG-5 of the Direct Testimony of Dr. Anthony Wayne Galli.
[2] Application, p. 4 para 9.
[3] Response to Staff Data Request No. 0152; Direct Testimony of Dr. Anthony Wayne Galli, p. 4 footnote 1; and Pages 7 of 11 and 8 of 11 in "Application for GRAIN BELT EXPRESS CLEAN LINE LLC" filed on 7/15/2013 in Docket 13-GBEE-803-MIS "In the Matter of the Application of Grain Belt Express Clean Line LLC for a Siting Permit for the Construction of a High Voltage Direct Current Transmission Line in Ford, Hodgeman, Edwards, Pawnee, Barton, Russell, Osborne, Mitchell, Cloud, Washington, Marshall, Nemaha, Brown, and Doniphan Counties Pursuant to K.S.A.66-1,177, et seq."
http://estar.kcc.ks.gov/estar/ViewFile.aspx/20130715113015.pdf?Id=67205ba7-09f7-44e4-ae58-5ddfd5de4957. (22AUG14).
[4] Response to Staff Data Request No. 0139.
[5] Direct Testimony of Dr. Anthony Wayne Galli, p. 4 ll. 13-16.
[6] The Maywood substation was formerly known as the "Palmyra tap".

transmission line;[7] and, a 345 kV AC collector system in Kansas designed to collect energy from wind farms and the SPP grid.[8]

Q. Can the project provide 3500 MW to the Illinois converter station (near Sullivan, Indiana) and 500 MW to the Missouri converter station simultaneously?

A. Staff does not know. Grain Belt Express' filings at the Federal Energy Regulatory Commission ("FERC"),[9] filings at the Kansas Corporation Commission ("KCC"),[10] statements to the public,[11] and certain schedules attached to the Direct Testimony of Dr. Anthony Wayne Galli indicate that the project will not be able to provide the full 4000 MW.[12] However, the responses to Staff Data Request Nos. 0162 and 0163 indicate that the project would be able to provide the full 4000 MW.[13]

Q. Has Grain Belt Express committed to a final design and operation of the project from the proposal as described in the Application?

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[7] In the response to Staff Data Request No. 0127, Grain Belt Express notes that the current studies include the potential to connect to the Maywood substation in Marion County, Missouri, but Grain Belt Express intends to proceed in the Definitive Planning Phase study with the Maywood-Montgomery 345 kV interconnection only.

[8] Response to Staff Data Request No. 0032.

[9] E.g. "Grain Belt Express' Project is a 750-mile HVDC transmission system which will be capable of delivering up to 3,500 MW of power..." Order Conditionally Authorizing Proposal and Granting Waivers, FERC Docket No. ER14-409-000, p.2.

[10] E.g. "The ±600 kV converter stations will be rated at approximately 3,756 MW in Kansas, 3,500 MW in Illinois/Indiana, and 1,000 MW in Missouri." p. 7 of 11 and 8 of 11 in "Application for GRAIN BELT EXPRESS CLEAN LINE LLC" filed on 7/15/2013 in Docket 13-GBEE-803-MIS "In the Matter of the Application of Grain Belt Express Clean Line LLC for a Siting Permit for the Construction of a High Voltage Direct Current Transmission Line in Ford, Hodgeman, Edwards, Pawnee, Barton, Russell, Osborne, Mitchell, Cloud, Washington, Marshall, Nemaha, Brown, and Doniphan Counties Pursuant to K.S.A.66-1,177, et seq." http://estar.kcc.ks.gov/estar/ViewFile.aspx/20130715113015.pdf?Id=67205ba7-09f7-44e4-ae58-5ddfd5de4957. (22AUG14).

[11] E.g. statements made by Grain Belt Express personnel in Exhibit 6 of File No. EA-2014-0207.

[12] Schedule AWG-4 to the Direct Testimony of Dr. Anthony Wayne Galli (p. 37) suggests that the line could only deliver 3500 MW to the Illinois converter station with the Missouri converter station operating at 0 MW and Schedule AWG-5 to the Direct Testimony of Dr. Anthony Wayne Galli indicates an injection of only 3755.8 MW.

[13] The direct testimonies of Grain Belt Express's witnesses never address the ratings of the Kansas converter station or DC line. Other statements are not clear if they are referring to the capability of the individual converter stations or the overall delivery capability (E.g. the Direct Testimony of Dr. Anthony Wayne Galli states, "The Project will be capable of delivering up to 3,500 megawatts ("MW") of power to the PJM market and up to 500 MW of power to the MISO market..." (p. 4, ll. 16-17)).

A. No. The final engineering studies are not completed and, as discussed later in my testimony, Grain Belt Express is still in the preliminary stages of the RTO interconnection study processes at the PJM, MISO, and SPP.[14] This project has already undergone large changes in scope since Grain Belt Express' initial application to the KCC, when the project was expected to deliver 3,500 MW at St. Francis County, Missouri[15]; and Staff is not certain if any other future changes will be proposed as necessary for the project to be economically feasible once the full costs are determined by the RTO interconnection studies.

Q. What energy can flow into Missouri from the project?

A. The converter station is physically capable of receiving up to 1,000 MW from the converter stations in Kansas and Illinois. Grain Belt Express is not seeking export transmission rights from the PJM for the Illinois converter station;[16] therefore, it is anticipated that all energy flowing into Missouri during normal operations would be from the SPP.

Q. What energy can flow out of Missouri from the project?

A. The converter station, as proposed, will be physically capable of exporting 1,000 MW;[17] however, no energy can be exported except in emergency situations and potentially limited periods of high congestion since Grain Belt Express is not seeking export rights from the MISO.[18]

Q. Will the energy from the SPP region be from wind generation facilities?

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[14] Response to Staff Data Request No. 0122.
[15] Page 3 in "Application for Grain Belt Express Grain Belt Express LLC" filed on 3/7/2011 in Docket 11-GBEE-624-COC "In the Matter of the Application of Grain Belt Express Grain Belt Express LLC for a Limited Certificate of Public Convenience to Transact the Business of a Public Utility in the State of Kansas." http://estar.kcc.ks.gov/estar/ViewFile.aspx/20110307170143.pdf?Id=55dbf9a6-3c20-4e57-987f-aa4df5ee7c28. (22AUG14).
[16] Response to Staff Data Request No. 0142.
[17] Direct Testimony of Dr. Anthony Wayne Galli, p. 4 footnote 1 and responses to Staff Data Request Nos. 0125 and 152.
[18] Response to Staff Data Request 0025.

A. Staff does not know. Grain Belt Express does "not expect to have binding or unconditional transmission service agreements [which would identify the type of energy] until after it obtains each of the four state [Kansas, Missouri, Illinois, and Indiana] approvals for the Project."[19] Furthermore, Grain Belt Express cannot screen potential transport customers based on the type of generation.[20]

However, in response to Staff Data Request No. 0014, Grain Belt Express stated that "wind energy is the only resource that has a proven cost advantage to generate in Western Kansas as opposed to Missouri or Indiana which justifies paying transmission service on the Project." This justification is also dependent on new wind generation, since Grain Belt Express stated "The Project serves no purpose without the new wind resources..."[21]

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Q. How much energy from the SPP region will be utilized by Missouri customers?

A. Staff does not know. The converter station will be physically capable of injecting 1,000 MW, but is only being studied to inject 500 MW.[22] It is also possible that the converter station would not inject any energy since the Illinois converter station (near

[19] Response to Staff Data Request No. 0082. Additionally, the response to Staff Data Request No. 0064 states that "[t]he open solicitation will be conducted after additional development milestones for the Project are reached but before financing is obtained. As Mr. Berry describes in page 42 of his Direct Testimony, Grain Belt Express will need to complete "the majority of its permitting and licensing processes" before entering into definitive, long-term capacity contracts."

[20] "Grain Belt Express has not proposed in its application, and we do not approve, selection or ranking criteria based upon the type of generation that a potential transmission customer might seek to interconnect." Order Conditionally Authorizing Proposal and Granting Waivers, FERC Docket No. ER14-409-000.

[21] Direct Testimony of Gary Moland, p. 5, ll. 6-7.

[22] Direct Testimony of Dr. Anthony Wayne Galli, p. 4 footnote 1.

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Sullivan, Indiana) may be capable of receiving all of the energy that the line is able to transmit.

Grain Belt Express does not currently have any transmission service requests, which could identify potential flows of energy into Missouri, and does "not expect to have binding or unconditional transmission service agreements until after it obtains each of the four state [Kansas, Missouri, Illinois, and Indiana] approvals for the Project."[23] ** _____ _____ _____ _____ **[24]

Mr. Berry, in his direct testimony, also discusses the potential for non-firm service.[25] In response to Staff Data Request No. 0123, Grain Belt Express stated, "Shippers could deliver power to Missouri on a short-term or non-firm basis when the price signals from the MISO market indicate power is needed, providing benefits to Missouri."[26] However, the opportunities for short-term or non-firm transmission are constrained by the inability of Grain Belt Express to inject power into the SPP[27] region or export power from the PJM[28] or MISO[29] regions, except under emergency situations,[30] according to the current plan as proposed by Grain Belt Express in its Application. In other words, eligible shippers would not be able to

[23] Response to Staff Data Request No. 0082. Additionally, the response to Staff Data Request No. 0064 states that "[t]he open solicitation will be conducted after additional development milestones for the Project are reached but before financing is obtained. As Mr. Berry describes in page 42 of his Direct Testimony, Grain Belt Express will need to complete "the majority of its permitting and licensing processes" before entering into definitive, long-term capacity contracts."
[24] Response to Staff Data Request No. 0136.
[25] Direct Testimony of David Berry, p. 10 ll. 3-12.
[26] Also mentioned in the Direct Testimony of David Berry, p. 10 ll. 9-12.
[27] Response to Staff Data Request Nos. 0005 and 0125.
[28] Response to Staff Data Request No. 0142.
[29] Response to Staff Data Request No. 0025.
[30] Response to Staff Data Request No. 0125.

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export or import power between the MISO and the PJM regions or to export power into the SPP region to take advantage of any market price differentials.[31]

Economic Feasibility

Q. Is the project as described in the Application economically feasible?

A. Staff does not know. Staff has several concerns about the economic feasibility of the project.

Q. What is Staff's first concern?

A. Staff's first and primary concern is that Grain Belt Express has not finished the SPP, MISO and PJM RTO study processes to have a complete estimate of the expenditures needed to construct the project and that several of the previous studies are insufficient since they are inconsistent with Grain Belt Express' current project design.

Q. Please describe the history and current status of Grain Belt Express' project in the MISO generation interconnection study process.

A. As Mr. Galli describes in his additional direct testimony, MISO's generation interconnection study process is a series of two studies with an optional third study.[32] Grain Belt Express' original project was to have a 3,500 MW converter station in St. Francois County, Missouri.[33] This was later revised to a 500 MW converter station in St. Francois County, Missouri, and a 3,000 MW converter station near the Sullivan, Indiana, substation[34] when an October 2011 MISO interconnection study determined that the 3,500 MW converter station was not economically feasible.[35] Grain Belt Express then completed a System Impact

[31] The response to Staff DR 0124 defines an eligible shipper as "any bona fide purchaser of transmission service, including utilities, generators, power marketers, or retail purchasers of unbundled transmission service."
[32] Additional Direct Testimony of Anthony Wayne Galli, P.E., p. 3 l. 18 –p. 6 l. 2.
[33] Direct Testimony of Mark Lawlor, p. 7 l. 20-p. 8 l. 2.
[34] SPA3-2010-MO J115 System Impact Study Update Call: May 3, 2012. Slide No. 7. https://www misoenergy.org/_layouts/MISO/ECM/Redirect.aspx?ID=130331 (05AUG14).
[35] Response to Staff Data Request No. 0129 and Direct Testimony of Mark Lawlor, p. 7 l. 20-p. 8 l. 2.

Study ("SIS"),[36] part of the Definitive Planning Process, on the 500 MW converter station and determined that the revised project was also not economically feasible.[37]

Currently, Ameren Services is performing the second optional study for the current project, the System Planning & Analysis ("SPA") Study, on behalf of MISO. Based on discussions with MISO employees, Staff does not expect the scope or results of this study to be meaningfully different from the initial Feasibility Study performed for this project. However, both the current study and the Feasibility Study are biased since they are limited to investigating the effects of a 500 MW converter station when the proposed station is a 1000 MW converter station for design purposes.[38] Limiting the scope of the study underestimates the amount of energy that could travel through the station and thus limits the review of upgrades that might be necessary to safely handle a larger injection of energy. Staff is also concerned that the studies assume the completion of certain transmission projects, such as the Mark Twain and Ottumwa to West Adair MISO MVP transmission projects,[39] which are due to be completed nearly simultaneously with the Grain Belt Express proposed project.[40] Grain Belt Express' studies presume the completion of these MVP transmission projects and have

[36] Ameren Services Transmission Planning (2012) "SPA3-2010-Missouri System Impact Study Final Report: Steady State Analysis" https://www.misoenergy.org/_layouts/MISO/ECM/Redirect.aspx?ID=130331 (05AUG14).
[37] Response to Staff Data Request No. 43.
[38] Response to Staff Data Request No. 152 and Direct Testimony of Dr. Anthony Wayne Galli, p. 4 footnote 1 and pages 7 of 11 and 8 of 11 in "Application for GRAIN BELT EXPRESS CLEAN LINE LLC" filed on 7/15/2013 in Docket 13-GBEE-803-MIS "In the Matter of the Application of Grain Belt Express Clean Line LLC for a Siting Permit for the Construction of a High Voltage Direct Current Transmission Line in Ford, Hodgeman, Edwards, Pawnee, Barton, Russell, Osborne, Mitchell, Cloud, Washington, Marshall, Nemaha, Brown, and Doniphan Counties Pursuant to K.S.A.66-1,177, et seq." http://estar.kcc.ks.gov/estar/ViewFile.aspx/20130715113015.pdf?Id=67205ba7-09f7-44e4-ae58-5ddfd5de4957. (22AUG14).
[39] Currently, both projects are expected to be completed in 2018. Sources: http://www.ameren.com/MarkTwain/Pages/MarkTwain.aspx, http://www.transmissionhub.com/articles/2014/02/itc-updates-project-progress-anticipates-new-capex-plan-in-april.html.
[40] "Construction of the Project is scheduled to begin as early as 2016 with completion projected to occur as early as 2018" (Application, p. 15, para. 37).

the effect of reducing cost for necessary transmission upgrades. If there is a delay in the MVP construction or if Grain Belt Express' project is completed ahead of schedule, then the ability to deliver some or all of the energy into Missouri may also need to be delayed.

Q. Does Staff anticipate that transmission upgrades, other than the MVP transmission projects discussed above, will be necessary due to the connection at the Maywood-Montgomery 345 kV transmission line?

A. Yes. MISO project number H086 proposed to connect approximately 300 MW of wind generation to a location ten miles north of the Spencer Creek substation, a point on the Maywood-Montgomery 345 kV transmission line in Ralls County, Missouri. The SIS report for that project included analysis for the system impacts with and without the MVP transmission projects and concluded that upgrades were needed.[41] Although "[t]he Feasibility Study did not identify any constraints associated with the 500 MW injection into MISO at the requested locations," it is reasonable to presume that the SIS would also indicate that upgrades would be needed for a 1,000 MW converter station. [42]

Q. Did the SPP's SIS, attached as Schedule AWG-4 to the Direct Testimony of Dr. Anthony Wayne Galli, study the current project design?

A. No. The SPP study contemplated a 500 MW injection in Missouri[43] and a 3000 MW injection at Sullivan, Indiana rather than 3500 MW. In fact, the study explicitly states that the "3500 MW injection option at Sullivan was not studied. This scenario will need to be addressed if the project moves forward with its current design."[44]

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[41] Ameren Services Transmission Planning (2012). "Midwest ISO DPP Cycle 5 – Illinois/Missouri System Impact Study Report." https://www misoenergy.org/Library/Repository/Study/Generator%20Interconnection/GI-DPP-2010-APR-IL-SIS Report.pdf (06AUG14).
[42] Direct Testimony of Anthony Wayne Galli, p. 14 ll. 17-18.
[43] "The GBX HVDC project only injects 500 MW at this 345 kV station…" (p. 39).
[44] Page 39.

Q. Does the SPP study identify transmission upgrade costs?

A. No, but SPP Criterion 3.5 studies[45] are not intended to assess transmission upgrade costs; those are assessed in later studies that should be completed before the project construction is started. SPP Criterion 3.5 "require[s] members to contact the SPP and the Transmission Working Group whenever new transmission facilities that impact the interconnected operation are in the *conceptual planning stage* so that the optimal integration of any new facilities can be identified."[46]

Q. Does the PJM feasibility study indicate upgrades will be necessary?

A. Yes. The initial PJM study indicates that a maximum of approximately $3.6 billion in upgrades may be necessary to support the Illinois converter station,[47] which does not include the estimated $2.2 billion to construct the project[48] or any upgrades necessary to support the transmission systems operated by the MISO or the SPP.[49] However, it is unclear how much of the $3.6 billion will be Grain Belt Express' responsibility since those expenditures will not be allocated until the SIS phase of the project.[50]

Q. What is Staff's second concern about the economic feasibility of the project?

[45] Direct Testimony of Anthony Wayne Galli, p. 13 ll. 9-11.
[46] Southwest Power Pool CRITERIA, p. 3-10 (emphasis added).
http://www.spp.org/publications/Criteria%20and%20Appendices%20April%2025,%202011.pdf. (28AUG14).
[47] PJM Interconnection (2013). "PJMDOCS-#734820-v1, X3-028 Sullivan 765 kV."
http://www.pjm.com/pub/planning/project-queues/merch-feas_docs/x3028_fea.pdf (07AUG14). See p. 42.
[48] Response to Staff Data Request No. 0151.
[49] The SPP study attached to the Direct Testimony of Anthony Wayne Galli as AWG-4 does not appear to include dollar values for the upgrades identified, but states: "The stability analysis will need to be repeated when the assumptions are better defined" (p. 8).
[50] PJM Interconnection (2013). "PJMDOCS-#734820-v1, X3-028 Sullivan 765 kV."
http://www.pjm.com/pub/planning/project-queues/merch-feas_docs/x3028_fea.pdf (07AUG14). See p. 42.

A. Staff is concerned that Grain Belt Express has not yet developed operational, maintenance, or emergency restoration plans for the project which adds uncertainty to the estimates of routine costs. [51]

Q. What is Staff's third concern about the economic feasibility of the project?

A. Staff is concerned that Grain Belt Express' proposal, which only allows export of energy from SPP, [52] limits the project's capability to earn revenue from transmission contracts on a short-term or non-firm basis as well as benefits for Missouri from energy exports, as previously discussed in my testimony.[53]

Q. What is Staff's fourth concern about the economic feasibility of the project?

A. Staff is concerned that the demand for wind energy from Missouri customers may not be large. The open solicitation process will not begin until after Grain Belt Express completes "the majority of its permitting and licensing processes."[54] The current evidence suggests that the need for the project may not be derived from Missouri retail customers, but from the Kansas wind-farm operators.[55]

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[51] Responses to Staff Data Request Nos. 0046, 0046.1, 0055, 0056, 0060, 0061, 0062, and 0063.
[52] Response to Staff Data Request Nos. 0005, 0025, 0125, and 0142.
[53] Grain Belt Express's response to the set of data requests Mr. Paul Agathen, on behalf of Missouri Landowners Alliance, submitted to Mr. Berry by email on Monday, July 14, 2014, at approximately 8:26 AM, copied to Staff in response to Staff Data Request No. 0132, requested Grain Belt Express' best estimate of the percentage of the megawatt-hours of energy delivered and sold in Missouri (question 1(q)) and Indiana (question 1(r)) under firm contracts. In response, Grain Belt Express stated: "Mr. Berry's estimate is that most of the energy delivered to Missouri via the Project would be transported under a long-term, legally binding firm transmission service contract" (Question 1, part (q) and (r)).
[54] Response to Staff Data Request No. 0064.
[55] In response to Staff Data Request No. 0136, ** [redacted] ** Additionally, the Direct Testimony of David Berry only identifies wind developers as persons who desire to buy Grain Belt Express's service (p. 27, ll. 2-6). Finally, Shuteye Creek, a 400-500 MW wind farm for parts of Sullivan, Putnam and Adair Counties, was terminated, in part, due to increasing evidence "that the wind energy market in Missouri will simply not develop in the foreseeable future given the lack of interest in wind energy in the state" (Rob Freeman, TradeWind Energy, LLC, http://www.heartlandconnection.com/news/story.aspx?id=738789#.U7RnI5go_X4 (11AUG14), see also the response to Staff Data Request No. 0143).

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Impact of Economic Feasibility on Missouri Retail Rates

Q. How do the transmission upgrade costs, which will not be known until the completion of the RTO interconnection study processes, affect Missouri retail rates?

A. Unless Grain Belt Express absorbs the cost without compensation, the transmission upgrade costs would either be passed through via RTO cost allocations or would increase the delivery rate of wind energy to Missouri.

Q. Does Staff know when the RTO interconnection study processes will be completed for Grain Belt Express?

A. No.

Q. Does the $2.2 billion to construct the project include any transmission upgrade costs?

A. No. The $2.2 billion is consistent with the direct spending in Dr. Loomis' study[56] which is for "the construction of the Grain Belt Express Clean Line itself".[57]

Q. Will some of the transmission upgrade costs be passed through the PJM, the MISO, or the SPP's regional cost allocation processes?

A. Staff does not know. In its response to Staff Data Request No. 0023, as it relates to PJM, Grain Belt Express states "that Grain Belt Express must pay for all direct connection and network upgrades necessary to accommodate the requested interconnection rights."[58] But as mentioned earlier, it is unclear how much of the maximum estimate of $3.6

[56] Table 3.1, Schedule DGL-2, p. 12 of 46.
[57] Schedule DGL-2, p. 4 of 46.
[58] Response to Staff Data Request No. 0023 (v).

billion for the PJM upgrades will be Grain Belt Express' responsibility since those expenditures will not be allocated until the PJM SIS phase of the project.[59]

Grain Belt Express' response to Staff Data Request No. 0023, as it relates to the MISO, states that ten percent of Network Upgrades rated at 345 kV and above will be recovered on a system-wide basis, which seems to be based on MISO's Transmission Planning Business Practices Manual.[60] However, Grain Belt Express' interconnection process is being performed under the MISO Generator Interconnection process. The MISO Generation Interconnection Business Practices Manual states: "[t]he Interconnection Customer [Grain Belt Express] will be solely responsible for the cost of the transmission upgrade..."[61]

The SPP's Generation Interconnection Procedures states that upgrades will be made on a "pro-rata" basis with other projects evaluated in a cluster.[62] Staff is unclear if the project will be evaluated under a different process due to its "'developmental' nature."[63]

Q. Does Staff have any estimates of the cost to deliver energy on the Grain Belt Express project with RTO transmission upgrades?

A. No. Staff cannot provide an estimate since the RTO interconnection study processes are incomplete. However, Staff notes that Mr. Berry estimated the cost to deliver

[59] PJM Interconnection (2013). "PJMDOCS-#734820-v1, X3-028 Sullivan 765 kV." http://www.pjm.com/pub/planning/project-queues/merch-feas_docs/x3028_fea.pdf (07AUG14). See p. 42.
[60] Transmission Planning Business Practices Manual, BPM-020-r10, Effective Date: APR-10-2014, https://www misoenergy.org/_layouts/MISO/ECM/Download.aspx?ID=19215. (22AUG14). See p. 23-24.
[61] Generation Interconnection Business Practices Manual, BPM-015-r9, Effective Date: JAN-17-2014, p.23-24, https://www misoenergy.org/Library/Tariff/Pages/Tariff.aspx. (28AUG14).
[62] Southwest Power Pool, Inc. Open Access Transmission Tariff Sixth Revised Volume No. 1 Superseding Fifth Revised Volume No. 1. p. 1869 of 2934. http://www.spp.org/publications/spp_tariff.pdf. (28AUG14).
[63] "TWG [SPP's Transmission Working Group] accepts the 'developmental' nature of this interconnection request and endorses proceeding to the next stage which requires more in-depth technical studies." Southwest Power Pool TRANSMISSION WORKING GROUP MEETING August 14-15, 2013 Hilton at the Ballpark – St. Louis, Missouri, p. 11 of 200.
http://www.spp.org/publications/TWG%208.14-15.13%20Minutes%20&%20Attachments.pdf. (28AUG14).

Kansas wind energy at 1.5-2.0 cents per kWh with a project cost at $2.2 billion.[64] If the transmission upgrades in the SPP, the MISO, and the PJM increase project costs sufficiently to double the delivery cost, then Missouri wind energy would be competitive[65] per Mr. Berry's LCOE graph on page 18 of his direct testimony.

Q. Could Grain Belt Express lower its delivery charges by receiving RTO cost allocation for the $2.2 billion in construction costs?

A. Not at this time, but potentially in the future. In the past, Clean Line Energy Partners, the parent company of Grain Belt Express, has actively sought the ability to partially allocate transmission project costs through the RTO process.[66] Although Grain Belt Express has agreed to not recover costs through the SPP or the MISO without further approval from the Missouri Public Service Commission,[67] Grain Belt Express has not forsworn partial recovery through the PJM, should that option ever become available.[68] However, since the

[64] Direct Testimony of David Berry, p. 17 ll. 12-14.

[65] Missouri-based wind resources also receive a 1.25 multiplier for compliance with the Electric Utility Renewable Energy Standard Requirement. (4 CSR 240-20.100(3)(G)).

[66] "To properly allocate costs commensurate with benefits engendered by HVDC projects like Rock Island and Grain Belt, Clean Line advocates that the PJM TOs adopt an approach to cost allocation akin to the Multi-Value Project approach implemented in the Midwest ISO." ("Clean Line Energy Comments to the Proposed Regional Cost Allocation Principles for Order No. 1000", http://www.pjm.com/~/media/committees-groups/committees/toa-ac/20120905/20120905-clean-line-cost-allocation-comments-for-tos.ashx. (19AUG14).)

"The Commission should require SPP to modify the compliance filing to allow for partial cost allocation of facilities instead of treating all facilities as either 'cost allocated' or 'not cost allocated.' If a merchant project is submitted for inclusion in the ITP as a DPP or Sponsored Project, the project sponsor should be allowed to propose that the project be studied as a solution to identified transmission needs. If these studies show regional benefits, some portion of the project cost should be eligible for cost allocation through the process identified in the SPP Compliance Filing." (Protest and Comments of Clean Line Energy Partners, LLC on Southwest Power Pool, Inc.'s Order No. 1000 Compliance Filing, p. 7, http://www.cleanlineenergy.com/sites/cleanline/media/resources/ER13-366_and_ER13-367_FERC_comments.pdf. (19AUG14).)

"If a transmission project is proposed as a merchant line with plans to sell capacity directly to customers, but is also found by a region or regions to satisfy some public policy or reliability need, or provide economic benefits, some of its cost should be considered for allocation commensurate with the regional benefit it provides." (Protest and Comments of Clean Line Energy Partners, LLC. on Midwest Independent System Operator, Inc. and MISO Transmission Owners' Order No. 1000 Compliance Filing, http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13129416. (19AUG14).)

[67] Additional Direct Testimony of David Berry, p. 2 ll. 1-11.

[68] Response to Staff Data Request No. 0146 and the Additional Direct Testimony of David Berry, p. 2 ll. 1-11.

electric utilities that serve retail load in Missouri operate under MISO or SPP tariffs, the impact of PJM partial cost allocation on Missouri ratepayers would be minimal.

Economic Development Benefits to Missouri

Q. Did Grain Belt Express provide an analysis of economic development benefits for Missouri?

A. Yes. This analysis was provided as DGL-2 in the Direct Testimony of Dr. David G. Loomis.

Q. Did that study estimate the number of jobs in Missouri?

A. Yes. Dr. Loomis' study included estimates for the number of jobs created in the construction and operations and maintenance (O&M) phases.

Q. Is the estimate of O&M jobs in Dr. Loomis' study consistent with Grain Belt Express's expectations of permanent jobs in Missouri?

A. No. Table 3.14 on page 27 of 46 of Schedule DGL-2 of Dr. Loomis's direct testimony estimates the direct impact of Grain Belt Express' annual O&M expenditures, estimated at $5 million, will result in 43 full-time equivalent ("FTE") jobs for Missouri. Grain Belt Express, in response to Staff Data Request Nos. 0060 and 0061, estimated its annual O&M expenditures at $8 million with only seven (7) jobs for line maintenance and 6 – 20 jobs for O&M at the converter station.[69]

Q. Are the differences between Dr. Loomis' study and Grain Belt Express' data request responses due to an improper or poorly performed study?

A. No. Staff did not find any errors in Dr. Loomis' study, and the divergence in responses may be due to the limitations of Input-Output models. Input-Output models, like

[69] The responses to Staff Data Request Nos. 0060 and 0061 also mention that it is feasible to operate the converter station unmanned.

JEDI (Jobs and Economic Development Impact) and IMPLAN (IMpact analysis for PLANning), assume linear, fixed proportion production and consumption functions, i.e., constant returns to scale, with constant technology, market shares, and consumer behavior, and no capacity or labor constraints.[70] In other words, if it currently takes one person with one grill to make 100 hamburgers a day, an input-output model assumes that it would take two persons with two grills to make 200 hamburgers a day.

Q. Does Dr. Loomis' study include potential effects of displacing Missouri-based electric energy resources such as wind?

A. No. Although it identifies changes to the energy productions of Missouri-based generation, this study does not address the displacement of jobs and energy production in Missouri due to the construction of the converter station.[71] Dr. Loomis mentions this limitation to his study on page eight (8) of 46 in Schedule DGL-2.[72] Additionally, Staff witness Sarah Kliethermes testifies that using Grain Belt Express' LMP analysis, the average Palmyra locational marginal pricing ("LMP") decreases from $32.16/MWh without the project to $31.23 with the project. Although there is a time difference between when peak wind would be blowing in Kansas and when peak wind would be blowing in Northeast Missouri, the project is likely to make Missouri-based wind projects, like the proposed 300 MW wind farm in the MISO region, project number H086, even less likely to be constructed.

Q. Does Dr. Loomis' study have other limitations?

[70] "Limitations of JEDI Models" http://www.nrel.gov/analysis/jedi/limitations.html (21AUG14), "IMPLAN Methodology" http://reic.uwcc.wisc.edu/implan/ (21AUG14), and class notes from Dr. Tom Johnson, "Agricultural Economics 9320: Regional Economic Theory and Methods" Spring Semester 2008 at the University of Missouri.
[71] Response to Staff Data Request No. 0012.
[72] See also response to Staff Data Request No. 0012.

A. Yes. The study does not include any intangible benefits or costs. Dr. Loomis discusses this and other limitations to input-output models on pages eight (8) and nine (9) of 46 in Schedule DGL-2. These and other limitations are why the results should be treated as rough estimates rather than forecasts.

Q. Is this analysis related to the analysis of economic feasibility?

A. No. Input-Output models assume that the project is economically feasible.

Other Issues

Q. Has Staff reviewed public comments concerning the projects impact on cultural, archeological, or historical sites?

A. Yes. Staff reviewed Grain Belt Express' process for identifying known archeological, cultural, and historic sites during the route development process and for mitigating the line's effects on those sites and found Grain Belt Express' processes to be consistent with the processes employed for other transmission projects in Missouri.

Conclusion

Q. Does Staff recommend that conditions be imposed on any authorization of Grain Belt Express' receipt of a CCN to build and operate the Project as described in the testimony of Staff witness Dan Beck?

A. Yes. Staff recommends that certain items be completed as a condition of the described CCN. Staff also recommends that certain items be brought back to the Commission for Commission approval (or acceptance) prior to any condemnation of Missouri real property. Staff and other parties to this case should be given an opportunity for review and comment on these items requiring Commission approval (or acceptance).

Q. Which of Staff's recommended conditions do you recommend the Commission include in any order approving Grain Belt Express' Proposal?

A. Staff recommends the Commission grant Grain Belt Express' request for a Certificate of Convenience and Necessity, Staff recommends the grant be conditioned on the completion and making public of all RTO interconnection studies with the Missouri converter station at 1000 MW and with the potential for exporting energy from the MISO and the PJM, and importing energy into the SPP with an opportunity for parties to review the studies and bring issues before the Commission, prior to Grain Belt Express commencing any eminent domain proceedings in Missouri.

Additionally, Staff recommends that the Commission condition Grain Belt Express commencing any eminent domain proceedings to after the actual construction of at least 25% of the completed cost, excluding engineering, planning, and land purchase costs, of the Missouri converter station.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Michael Stahlman

Education

2009	M. S., Agricultural Economics, University of Missouri, Columbia.
2007	B.A., Economics, Summa Cum Laude, Westminster College, Fulton, MO.

Professional Experience

2010 -	Regulatory Economist, Missouri Public Service Commission
2007 – 2009	Graduate Research Assistant, University of Missouri
2008	Graduate Teaching Assistant, University of Missouri
2007	American Institute for Economic Research (AIER) Summer Fellowship Program
2006	Price Analysis Intern, Food and Agricultural Policy Research Institute (FAPRI), Columbia, MO
2006	Legislative Intern for State Representative Munzlinger
2005 – 2006	Certified Tutor in Macroeconomics, Westminster College, Fulton, MO
1998 – 2004	Engineering Watch Supervisor, United States Navy

Expert Witness Testimony

Union Electric Company d/b/a AmerenUE — GR-2010-0363
In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Natural Gas Service Provided to Customers in the Company's Missouri Service Area

Union Electric Company d/b/a Ameren Missouri — GT-2011-0410
In the Matter of the Union Electric Company's (d/b/a Ameren Missouri) Gas Service Tariffs Removing Certain Provisions for Rebates from Its Missouri Energy Efficient Natural Gas Equipment and Building Shell Measure Rebate Program

KCP&L Great Missouri Operations Company — EO-2012-0009
In the Matter of KCP&L Greater Missouri Operations Company's Notice of Intent to File an Application for Authority to Establish a Demand-Side Programs Investment Mechanism

Union Electric Company d/b/a Ameren Missouri — EO-2012-0142
In the Matter of Union Electric Company d/b/a Ameren Missouri's Filing to Implement Regulatory Changes Furtherance of Energy Efficiency as Allowed by MEEIA

Kansas City Power & Light Company — EO-2012-0323
In the Matter of the Resource Plan of Kansas City Power & Light Company

KCP&L Great Missouri Operations Company — EO-2012-0324
In the Matter of the Resource Plan of KCP&L Greater Missouri Operations Company

Kansas City Power & Light Company, KCP&L Great Missouri Operations Company, and Transource Missouri — EA-2013-0098, EO-2012-0367

In the Matter of the Application of Transource Missouri, LLC for a Certificate of Convenience and Necessity Authorizing it to Construct, Finance, Own, Operate, and Maintain the Iatan-Nashua and Sibley-Nebraska City Electric Transmission Projects

Kansas City Power & Light Company EO-2012-0135
KCP&L Great Missouri Operations Company EO-2012-0136
In the Matter of the Application of Kansas City Power & Light Company [KCP&L Great Missouri Operations Company] for Authority to Extend the Transfer of Functional Control of Certain Transmission Assets to the Southwest Power Pool, Inc.

Kansas City Power & Light Company EU-2014-0077
KCP&L Great Missouri Operations Company
In the Matter of the Application of Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company for the Issuance of an Accounting Authority Order relating to their Electrical Operations and for a Contingent Waiver of the Notice Requirement of 4 CSR 240-4.020(2)

Kansas City Power & Light Company EO-2014-0095
In the Matter of Kansas City Power & Light Company's Notice of Intent to File an Application for Authority To Establish a Demand-Side Programs Investment Mechanism

Veolia Energy Kansas City, Inc HR-2014-0066
In the Matter of Veolia Energy Kansas City, Inc for Authority to File Tariffs to Increase Rates

Selected Manuscripts

Stahlman, Michael and Laura M.J. McCann. "Technology Characteristics, Choice Architecture and Farmer Knowledge: The Case of Phytase." Agriculture and Human Values (2012) 29:371-379.

Stahlman, Michael. "The Amorality of Signals." Awarded in top 50 authors for SEVEN Fund essay competition, "The Morality of Profit."

Selected Posters

Stahlman, Michael, Laura M.J. McCann, and Haluk Gedikoglou. "Adoption of Phytase by Livestock Farmers." Selected poster at the American Agricultural Economics Association Annual Meeting, Orlando, FL, July 27-29, 2008. Also presented at the USDA/CSREES Annual Meeting in St. Louis, MO in February 2009.

McCann, Laura, Haluk Gedikoglu, Bob Broz, John Lory, Ray Massey, and Michael Stahlman. "Farm Size and Adoption of BMPs by AFOs." Selected poster at the 5th National Small Farm Conference in Springfield, IL in September 2009.