Exhibit No.:____
Issues: The Need for the Amended Grain Belt Express Project
which further Promotes the Public Interest
Witness: John Grotzinger
Type of Exhibit: Rebuttal Testimony
Sponsoring Party: MEC
File No.: EA-2023-0017

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

FILE NO. EA-2023-0017

REBUTTAL TESTIMONY

OF

JOHN GROTZINGER

ON BEHALF OF

THE MISSOURI JOINT MUNICIPAL ELECTRIC UTILITY COMMISSION d/b/a MISSOURI ELECTRIC COMMISSION

APRIL 19, 2023

NP

I. INTRODUCTION OF WITNESS AND TESTIMONY

Q. Please state your name, title, and business address.

A. My name is John Grotzinger. I am the Chief Electric Operations Officer of the Missouri Public Utility Alliance ("MPUA"), which includes the Missouri Joint Municipal Electric Utility Commission d/b/a Missouri Electric Commission ("MEC"). MEC's business address is 2200 Maguire Boulevard, Columbia, MO 652031

Q. Please describe your professional background.

A. I joined MEC in 1994 as the Planning Engineer. I served in increasingly responsible roles as the Director of Engineering for Engineering and Operations, and Chief Operating Officer-MJMEUC, before being named to my current position as Chief Electric Operations Officer. Prior to MEC, I worked over 14 years at City Utilities in Springfield, Missouri, with my last position being a System Planning Engineer. Prior to working at City Utilities, I was a planning engineer at Kansas City Power & Light from 1979-1980. I hold a Bachelor of Science in Electrical Engineering from the University of Missouri-Columbia and am a licensed electrical engineer in the state of Missouri. I have nearly 45 years of utility experience in planning electrical distribution and transmission systems and in planning for and meeting the generation needs of customers. My curriculum vitae is attached as Schedule JG-1.

Q. Do you have any experience in developing power supplies for wholesale customers?

A. Yes. I have developed a number of resources to meet the needs of MEC's members, whether as full requirements needs or for unit power purchase agreements ("PPAs"). Those resources have included coal, diesel, landfill gas, natural gas, solar and wind. I

have extensive experience in resource planning and developing requests for proposals, as well as engaging in project development.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of MEC, an intervenor in this proceeding.

Q. Have you previously testified before the Missouri Public Service Commission?

A. Yes. Most recently, I provided surrebuttal testimony in EA-2022-0099. But, perhaps most relevant to this case, I provided rebuttal, surrebuttal and hearing testimony in the related case in which Grain Belt Express, LLC ("Grain Belt") received its Certificate of Convenience and Necessity ("CCN"), EA-2016-0358.

Q. What is the purpose of your testimony?

A. My testimony provides further explanation and information additional to the testimony of Grain Belt witness Shashank Sane regarding the transmission services agreement ("TSA") that MEC has with Grain Belt, the corresponding PPA that MEC has with Santa Fe Wind Project, LLC ("Santa Fe," the assignee of the Iron Star Wind Project, LLC "Iron Star"), and the corresponding PPAs executed by MEC for the benefit of the Missouri Public Energy Pool ("MoPEP"), Centralia, Columbia, Hannibal and Kirkwood. This Amended Project will allow more low-cost renewable energy to flow sooner across Grain Belt and into the Midcontinent Independent System Operator ("MISO") and the Associated Electric Cooperative Incorporated ("AECI"), where it will be delivered to the MEC members who have already executed contracts, and other members I expect will yet choose to participate in this opportunity to buy renewable energy for their customers at a competitive price delivered to Missouri.

Q. Please summarize your testimony.

A. Grain Belt's Amended Project will provide MEC's members with needed affordable renewable energy. Although the amendments Grain Belt seeks to its CCN may have changed MEC's analysis and some of the earlier numbers, Grain Belt remains the best option for low cost renewable energy delivered into MISO. Across the MISO footprint, in the year 2028, Grain Belt is projected to reduce the marginal energy component of the locational marginal price ("LMP") on average by $1.77/MWh, which savings applied to the MISO load will amount to over $1.1 billion. The LMPs at the nodes of particular interest to MEC had an annual average drop ranging from $1.10/MWh to $37.56/MWh after the injection of Grain Belt renewable energy into AECI and MISO. MEC and I expect the benefits of Grain Belt to continue throughout the life of our twenty-plus year contract.

II. BACKGROUND ON MEC'S RESOURCE PLANNING RELEVANT TO GRAIN BELT

Q. Please describe MEC's current view of the June 2, 2016 Long Term TSA between Grain Belt and MEC?

A. MEC believed that TSA was competitive when MEC signed it in 2016, and it remains active and attractive to MEC, as shown by the fact that Grain Belt and MEC have between 2018 and 2020 executed four subsequent documents to update the parties' agreement for this transmission service, and all five of those documents are attached as Schedules JG-2, JG-3, JG-4, JG-5 and JG-6.

Q. **[redacted]**

A. **[redacted].**

Q. **[redacted]**

A. **[redacted]**

Q. Please describe MEC's current view of the January 24, 2017 PPA between Iron Star and MEC?

A. MEC believed that PPA to be competitive when MEC signed it in 2017, and it remains active and attractive with these amendments: (1) Iron Star Wind Project, LLC assigned this PPA to Santa Fe Wind Project, LLC; (2) the anticipated delivery date is December 31, 2026 and we are currently working to update that date; and (3) MEC has the option to purchase up to an additional 64 megawatts ("MW") in addition to the original 136 MW, for a total of 200 MW. The 2017 PPA and the two subsequent amendments are attached as Schedules JG-7, JG-8 and JG-9.

Q. How much of the 200 MW of the Santa Fe renewable energy and Grain Belt transmission has been subscribed by firm contracts?

A. MEC's contracts with Grain Belt and Santa Fe are firm. To this day, 136 of the 200 MW is under firm contracts. There are thirty-five municipal members of MoPEP and a Missouri

map showing the names and locations of those cities is attached as Schedule JG-10. MoPEP has contracted for 60 MW, and that contract is attached as Schedule JG-11. The city of Kirkwood has contracted for 25 MW and the city of Hannibal has contracted for 15 MW, and those contracts are attached as Schedule JG-12. The city of Centralia has contracted for 1 MW and the city of Columbia has contracted for 35 MW, and those contracts are attached as JG-13. I fully expect the demand of other MEC members will exceed the 64 MW that remains for subscription under the Grain Belt TSA and the Santa Fe PPA.

Q. Do you expect either of MEC's other full requirements pools to also choose to participate in Grain Belt's delivery of renewable energy to Missouri?

A. MEC's Mid-Missouri Municipal Power Energy Pool ("MMMPEP") may consider the opportunity to participate because of its proximity to AECI from which it could take some of the renewable energy that I understand Grain Belt will now inject into that node. MoPEP, MMMPEP, and other of MEC's member who are physically located within the AECI region, will be able to take advantage of the Kansas wind without needing a costly separate transmission path through MISO or the Southwest Power Pool ("SPP").

Q. In the past, as MEC has participated in other projects, has the interest of its pools or individual members grown over time?

A. Yes. As municipalities become aware of additional options for their resource planning, they often include those resources in their planning to meet future needs. The agreements between MEC and Grain Belt and Santa Fe allow for other municipalities to join in the benefits of these contracts before Grain Belt becomes operational. Given that we know the current need for Grain Belt by Missouri municipalities is 136 MW, MEC would not be surprised if that need reaches or exceeds the TSA limit of 200 MW in response to changes

in the market and resources available to municipalities.

Q. What did MEC do to replace MoPEP's Illinois Power Marketing ("IPM") contract that, according to your testimony in the previous case, was to expire in 2021?

A. The coal-generated energy from IPM has been replaced by SPP combined-cycle natural gas generation, SPP wind generation capacity, and the assigned Iron Star/Santa Fe PPA. The MISO Grain Belt portion of that replacement has been temporarily filled with higher-cost short-term energy purchases pending the full commercial operation of Grain Belt.

Q. Given that more expensive resources have been acquired to temporarily fill MoPEP's needs until Grain Belt is fully operational, who must pay the difference in cost?

A. The customers of the thirty-five MoPEP cities will pay the additional cost.

Q. When Grain Belt is fully operational, how will the expected cost savings be reflected to the MoPEP member cities?

A. Wholesale energy costs will be lowered. While transmission charges to deliver energy to individual cities are different depending on the location of the member city, energy costs are socialized across the pool, including the cost of transmission to deliver that energy into MISO, SPP or AECI. This means that the lower energy costs will be shared equally by all thirty-five city members of MoPEP.

III. DEMAND WITHIN MEC FOR RENEWABLE ENERGY

Q. Have Missouri cities demonstrated a desire for renewable energy?

A. Yes. Columbia has a renewable portfolio standard that exceeds the Missouri statutory standard applicable to investor-owned utilities. Additionally, the MoPEP has consistently

been a leader in the state in developing wind and solar projects, and their customers continue to express a desire for more renewable energy.

Q. When did the MoPEP begin to offer a renewable product for its wholesale members?

A. The opportunity was approved in the fall of 2016, and deliveries started in January of 2017.

Q. What is that product?

A. It is now a 20 MW option offered at a small premium over other resources to reflect the additional cost currently associated with those renewable resources in the MoPEP portfolio. It allows our wholesale customers to market a renewable product to their retail customers.

Q. Did the MoPEP members have difficulty in providing that product in a retail form to the members' retail customers?

A. No. It was fully subscribed, with additional demand unmet.

Q. Do the MoPEP members have a desire for additional renewable resources that are more affordable than current options?

A. Yes. Given that the renewable product described above was quickly subscribed, and that members continue to demand additional renewable products, I believe that the demand for renewables is still unmet. Currently, MoPEP's portfolio is 15% renewable, and with Grain Belt operational, that portfolio will be over 25% renewable.

Q. Do you expect industrial retail customers will want additional renewable energy in the future?

A. Yes. We have observed that industrial retail customers of our wholesale customers are

placing renewable energy goals in their corporate procurement policies. The Grain Belt project gives our cities the opportunity to meet those policies and remain or become attractive locations for those industries.

IV. MEC'S SUPPORT FOR GRAIN BELT'S REQUEST TO AMEND ITS CCN

Q. Does Grain Belt's request to amend its CCN promote the public interest?

A. Yes, the Grain Belt Project that has already been granted a CCN by this Commission promoted the public interest and, although the amendments Grain Belt seeks to its CCN may have changed some of the earlier numbers, Grain Belt remains the best option for low cost renewable energy delivered into MISO. There are many more besides me that hold that opinion. From my experience, the thirty-five MoPEP cities, Centralia, Columbia, Hannibal and Kirkwood would not have already committed to purchasing power through the Grain Belt TSA unless they also concluded that it was in their best interest to do so. The amendments Grain Belt now seeks to its CCN are designed to deliver more renewable energy sooner to Missouri injection points in both MISO and AECI, and that is in the public interest because energy costs will be lowered at the Missouri nodes relevant to MEC and across the MISO footprint.

Q. What are the facts or data upon which you reasonably relied to form your opinion that the Grain Belt Amended Project will promote the public interest of Missourians by lowering the cost of energy?

A. I relied, of course, on my many years of experience in planning electrical distribution and transmission systems and in planning for and meeting the generation needs of customers. Additionally, MEC, through its Chief Markets Officer Rebecca Atkins and me, consulted with The Energy Authority ("TEA") for its independent strategic perspective, advice,

analysis and projected effect of the Amended Grain Belt project on LMPs at certain Missouri nodes identified by MEC as significant to its members. The TEA study, which is attached as Schedule JG-14, substantiates my conclusion that the Amended Grain Belt project will cause an overall decrease in energy costs in MISO.

Q. What Missouri nodes did MEC designate for the TEA study and what is the significance of each?

A. Slide 3 of Schedule JG-14 shows the nodes MEC designated for TEA's study. AMMO.MOBCTG1 is a high voltage connector, and thus an existing price node, near the city of Centralia and the new location of the Grain Belt converter station. AMMO.PENOCTG1 is the Peno Creek node, near the city of Bowling Green. EAI.PLUM1_MEUC is MEC's Plum Point generator. AMIL.PSG1.MEUC is the Prairie State Energy Center generator in which MEC has an ownership interest. ALTW.CRLK3CWLD is the Crystal Lake Iowa wind farm on the west side of MISO. MEC.FARMER is an Iowa wind farm that provides competitive wind pricing and from which the city of Columbia takes some energy. Injection to AECI was selected because the Grain Belt amendments will permit injection into that node. The AECI interface node was chosen to look at Grain Belt's cost impacts on transactions across the seam. The injection to MISO will be the new node created by Grain Belt's Tiger Connector. AMMO.HANN_1.AZ is the city of Hannibal. SWPP is SPP's currently existing interface node. CWLD.CWLD is the city of Columbia. AMMO.KIRK is the city of Kirkwood, and WR.MOWR is the node for MoPEP.

Q. What is the time period covered by the TEA study and why?

A. MEC directed TEA to study the effect of the Grain Belt Amended Project on LMPs at the

designated nodes for the year 2028, the anticipated first full year of Grain Belt's operation, as compared to a "business as usual" scenario that did not include Grain Belt.

Q. You've already told us that LMP is an acronym for "locational marginal price" – would you explain what the locational marginal price is?

A. In everyday terms, the LMP is the price that reflects the cost of supplying electricity at a particular time at a particular point on the power grid, taking into account the cost of generation, transmission losses and congestion.

Q. What did you conclude about the effect of the Amended Grain Belt Project on the LMPs relevant to MEC?

A. I expected that Grain Belt's entrance into this market would lower costs for MEC members, and the TEA study bore that out. The summary found at Slide 9 of Schedule JG-14 shows that the LMPs at the relevant nodes had an annual average drop ranging from $1.10/MWh to $37.56/MWh after the injection of Grain Belt renewable energy into AECI and MISO. Slide 10 is a helpful bar graph showing the lower annual average LMP that occurred at each of the relevant nodes with Grain Belt, as compared to the higher LMPs that occurred in a "business as usual" scenario.

Q. In the CCN case five years ago, you testified that MEC's members would benefit because Grain Belt's injection point into MISO would consistently have the highest LMP for wind energy among the pricing nodes used by MEC's members – please explain why Grain Belt's effect now of lowering LMPs across the MISO footprint remains beneficial to MEC?

A. In both cases, lower LMPs at member load nodes are beneficial. In the prior case five years ago, MEC's focus was on the significant difference between projected market

prices and the below-market price provided by the MEC contract with Grain Belt (and Iron Star, which is now Santa Fe). Now, however, the sheer difference in size of the Amended Grain Belt project compared to five years ago – 2500 MW instead of 500 MW – caused MEC to evaluate the impact on the larger market. This injection of 2500 MW (plus, conservative assumptions about generator retirements) could, for periods of time, drive the LMPs at the injection points below the delivered price of the Grain Belt and Santa Fe energy, certainly if MISO fails to integrate Grain Belt before its commercial operation date. And, by the 2028 study year, more coal generation could be retired, some of which will be replaced by potentially higher priced natural gas generation. Regardless, Grain Belt's injection of 2500 MW of renewable energy will cause a broader flattening of LMPs across the market so that the Grain Belt price at the injection points for MEC's members will result in cost savings, and others also will receive the benefit of lower LMPs across the MISO footprint.

Q. What did MEC direct TEA to do to account for the planned retirement of some thermal generators during the study period?

A. We decided that it is not reasonable for us to assume that all thermal generation will retire just as soon as some have announced without expansion and/or improvement of necessary transmission. And, we decided that it is not reasonable for us to assume that no thermal generation will be retired by our study year. So, TEA's model retired the thermal generators that will be more than 60 years old in 2028. (Schedule JG-14, Slide 7). The retirement of thermal generation will have to be reasonably implemented and additional transmission like Grain Belt is needed to ensure a reliable and cost-effective transmission grid and energy portfolio.

Q. After taking into account the retirement of some thermal generation, what did you conclude about the effect of the Amended Grain Belt Project on the LMPs relevant to MEC?

A. I expected that the LMPs would drop even after the appropriate retirement of some thermal generation, and the TEA study bore that out. Slide 9 of Schedule JG-14 shows that, after the insertion of Grain Belt, the LMPs had an annual average drop ranging from $1.04/MWh to $30.79/MWh.

Q. Did MEC direct TEA to study the effect on LMPs at the relevant nodes of higher than normal and lower than normal natural gas costs?

A. Yes. Given our experience in the past couple of years with volatile and high natural gas costs, MEC asked TEA to include high and low natural gas costs in the scenario. Slide 11 of Schedule JG-14 shows that, with Grain Belt operational during a period of low natural gas costs, annual average LMPs dropped at every node. And, with Grain Belt operational during a period of high natural gas costs, annual average LMPs increased but only by an average of $4.86, which is not nearly as intimidating as what many of us experienced only a couple of years back.

Q. What is the overall effect of the Amended Grain Belt Project on the cost of energy?

A. Across the MISO footprint, in the year 2028, Grain Belt is projected to reduce the marginal energy cost of the LMP on average by $1.77/MWh, which savings applied to the MISO load will amount to over $1.1 billion (Slide 15 of Schedule JG-14).

Q. That projected $1.1 billion in reduced marginal energy costs across MISO and the projected lowering of LMPs at the nodes relevant to MEC is for the year 2028, and MEC has a twenty-plus year contract with Grain Belt – do you expect those savings

to continue beyond 2028?

A. Yes. Although it is tremendously difficult to forecast many years into the future, I do expect the benefit of Grain Belt to continue throughout the life of MEC's contract.

Q. Does MEC need Grain Belt's requested amendments to its CCN?

A. Absolutely. MEC's members need affordable renewable energy, and Grain Belt will provide that along with reduced LMPs at the nodes relevant to MEC's members and reduced marginal energy costs across MISO.

Q. Do you hold the opinions you've expressed in this testimony to a reasonable degree of engineering certainty?

A. Yes.

Q. Does this conclude your pre-filed rebuttal testimony in this case?

A. Yes. However, I wish to preserve the right to provide additional testimony in the form of sur-rebuttal or at the hearing to rebut the testimony of any other party.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

STATE OF MISSOURI	)	
	)	SS
COUNTY OF BOONE	)	

AFFIDAVIT OF JOHN GROTZINGER

John Grotzinger, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying rebuttal testimony and schedules; that said testimony was prepared by him or under his direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge, information, and belief.

John Grotzinger

Subscribed and sworn to before me this 7th day of April, 2023.

KONDA D. BENTLEY
Notary Public, Notary Seal
State of Missouri
Boone County
Commission # 12693265
My Commision Expires 07/24/2024

Notary Public

My commission expires: 07/24/2024