BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express LLC for an Amendment to its Certificate Of Convenience and Necessity Authorizing it to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and Associated Converter Station	)	File No. EA-2023-0017

SIERRA CLUB'S POST-HEARING BRIEF

Sierra Club respectfully requests that the Commission approve the Grain Belt Express transmission project. The Commission should find that there is a "need" for the Grain Belt Express because it will maintain or improve Missouri electrical customer service in multiple ways. The Grain Belt Express transmission line will markedly improve the economic operation of the grids in Missouri, offer significant resilience value especially during storms and other high-demand events, and improve the reliability of the grid for customers and utilities in Missouri.

First, the Grain Belt Express will provide significant economic benefits to Missouri. The operational economic benefits from building transmission primarily result from the reduction in transmission constraints, allowing for access of remote generation resources that may have lower variable costs of producing energy, such as wind and solar. Recent studies have found that congestion of the transmission system costs customers billions of dollars per year in Midcontinent Independent System Operator ("MISO") and Southwest Power Pool ("SPP"). By providing a new "pathway" connecting resources to demand, existing constraints between Kansas and Missouri will be reduced and therefore electric costs will be lowered overall. The Grain Belt Express would help alleviate the curtailment of renewable energy by providing a new outlet to regions that need cost-effective energy. By removing congestion and improving access to low-cost generation, the Grain Belt Express will lower costs for Missouri customers throughout the state.

Second, the Grain Belt Express will increase operational reliability of the grids in Missouri and will improve long-term reliability and resource adequacy. Operational reliability will be enhanced by the stronger links between regions that would help the grid to respond to disturbances, such as the loss of a large generator. A stronger connection to neighboring areas allows for greater contingency reserve sharing, and for a better, more coordinated economic dispatch response as part of the recovery from a disturbance. Stronger transmission connections would allow for more coordinated resource planning across the region. Further, utilities in Missouri will have broader access to projects when they plan to meet their reserve margin requirements.

Third, Grain Belt Express will improve resilience of the grids in Missouri, as it will link together disparate areas, both in terms of geography and grid regions that include MISO, SPP, and PJM. In effect, Grain Belt Express will help create a larger geographic/electrical area, which helps make the 'grid larger than the storm,' enabling relatively remote resources not affected by a storm to deliver to load centers within a storm that otherwise might be without power. The expanded capacity of the Grain Belt Express would deliver significant resilience benefits during storms and similar events by allowing more power to flow between grid regions.

A primary feature of the Grain Belt Express is that it will to link SPP and MISO, which is one of the highest value pair of regions to connect, according to a recent U.S. Department of Energy study.[1] Electric customers in Missouri need reliable electric system at just and reasonable rates. Because the Grain Belt Express transmission line will provide lower-cost energy to Missouri customers, while also improving the resilience and reliability of the electric grids in Missouri, the Commission should approve the Grain Belt Express.

[1] Exhibit 850, Rebuttal Testimony of Michael Milligan on behalf of Sierra Club ("Milligan Rebuttal Testimony") at 5-6.

I. Under Missouri Law, "Need" Is Broadly Defined to Include a Project For Which Cost Is Justified By Improvements to Electric Service.

Missouri statutes do not lay out specific criteria for the Commission to apply when deciding whether to issue a Certificate of Convenience and Necessity ("CCN"). Instead, the legislature has instructed the Commission to approve a CCN when a project "is necessary or convenient for the public service." RSMo § 393.170.3. When deciding whether a project is necessary or convenient, the Commission has traditionally applied the *Tartan* factors, the first of which is that there must be a need for the service. *Application of Ameren Missouri for Approval of Pilot Solar Program*, Report and Order, Case No. EA-2016-0208, 2016 WL 7441690, at *10 (Mo. P.S.C. 2016). Missouri courts have clarified that the term "necessity" does not mean "essential" or "absolutely indispensable," but rather that the project would be an improvement justifying its cost. *State ex rel. Intercon Gas v. Pub. Serv. Comm'n*, 848 S.W.2d 593, 597–8 (Mo. Ct. App. W.D. 1993). In addition, the determination of whether a project is necessary or convenient cannot focus solely on a present need but must take the future into account as part of a comprehensive evaluation. *Application of KCP&L-GMO for Approval of Solar Facilities*, 515 S.W.3d 754, 760 (Mo. Ct. App. W.D. 2016) (". . . in matters of public convenience and necessity there must be consideration of the future.") (citing *Ringo v. Pub. Serv. Comm'n*, 234 Mo. App. 549, 132 S.W.2d 1080, 1082 (1939); *State ex rel. Gulf Transport Co. v. Pub. Serv. Comm'n*, 658 S.W.2d 448, 458 (Mo. Ct. App. W.D. 1983)).

Under this legal framework, the Commission should find that the Grain Belt Express transmission line is "needed" under the *Tartan* factors if it finds that the Project would improve or maintain customer service or meet an upcoming specific need, including needs for low-cost energy at stable prices and a resilient and reliable electric transmission grid. As explained below, the Grain Belt Express meets that standard.

II. The Grain Belt Express Provides Significant Economic Benefits to Missouri's Electric Customers.

There is significant evidence that Missouri electric customers will receive economic benefits from the construction of the Grain Belt Express. The primary source of economic benefit is reduced transmission system congestion and access to lower-cost generation resources. The operational economic benefits from building transmission primarily result from the reduction in transmission constraints, allowing for access of remote resources that may be more economic, such as wind and solar. "Congestion" on the grid occurs when there is insufficient transmission capacity to deploy a resource (or group of resources) to cost-effectively meet demand. Congestion on the grid causes a reduction in power flows from economic resources, causing the grid operator to deploy more expensive resources from an uncongested area to meet demand.

Recent studies have found that congestion of the transmission system costs customers billions of dollar per year in MISO and SPP. A Grid Strategies study found that total congestion costs in MISO have reached $2.8 billion in 2021, rising from the already high $1.4 billion in congestion costs in 2016.[2] For SPP, this same study found that congestion costs were $1.2 billion in 2021, having risen very significantly from $280 million in 2016.[3] U.S. Department of Energy's 2023 National Transmission Need Study found that Southeast Missouri in particular has "experienced consistently high prices for at least the past two to three years."[4] Real-time energy price differentials between SPP and its neighbors, including MISO, have been high and increasing

[2] Milligan Rebuttal Testimony at 11.

[3] *Id.* at 11-12.

[4] *Id.* at 6 (citing 2023 *National Transmission Needs Study*, at ix.).

for the last 5 years.[5] Accordingly, the Grain Belt Express would play a significant role in helping improve this transmission need.[6]

Moreover, the Grain Belt Express will reduce costs by reducing curtailment of wind. Congestion causes the curtailment, or reduction, of wind energy output, requiring the substitution of a more expensive resource instead. In general, wind has very low variable costs and would be dispatched by SPP or MISO before a generating unit that requires fuel, assuming no congestion. But with congestion, the more cost-effective resource must be (at least partially) curtailed, substituting the energy that would otherwise have been delivered with energy from a more expensive resource. In a recent study, S&P Global found that "[d]ramatic growth in curtailment rates and congestion costs from 2019-2021 indicate a high degree of transmission constraint in the grid[.]"[7] Wind curtailment in SPP increased over fivefold — from about 1.2 million MWh in 2019 to over 6.3 million MWh in 2021.[8] If wind energy is behind a transmission constraint, there may be times that its output must be reduced (curtailed) so as not to exceed transmission path ratings. If new transmission can alleviate that constraint, more wind energy could be delivered to load centers, allowing gas or coal plants to reduce their output and reduce fuel use. The ability to access cheaper resources than would be otherwise available is a key benefit of Grain Belt Express.

Further, as part of its planning process for the so-called Tranche 1 transmission projects, MISO has found significant economic benefits vastly exceed the cost of the construction of long-distance transmission. MISO found that electric customers would receive $2.60 to $3.80 in benefits

[5] *Id.* at 7 (citing 2023 *National Transmission Needs Study*, at ix.).

[6] *Id*.

[7] *Id.* at 10-11.

[8] *Id.* at 11.

for every dollar of transmission costs.[9] The largest source of such benefits is a reduction of congestion, though MISO also found that the avoided risk of load shedding and resource adequacy savings also provide significant savings.[10] Sierra Club witness Milligan testified that similar benefits would result from the construction of the Grain Belt Express.[11]

By providing a new "pathway" connecting resources to demand, existing constraints between Kansas and Missouri will be reduced. This decreases congestion and allows more access to economic resources that may have otherwise been unreachable. The Grain Belt Express would help alleviate the curtailment of renewable energy by providing a new outlet to regions that need cost-effective renewable energy.

III. The Grain Belt Express Provides Significant Reliability and Resource Adequacy Benefits to Missouri's Electric Customers.

The Grain Belt Express transmission line will enhance operational reliability and resource adequacy in Missouri. Three categories of reliability benefits are worth emphasis: i) the decrease in reserve margin requirement; ii) enhanced access to generation for each load-serving utility's resource adequacy planning; and iii) an improvement in day-to-day operational reliability.

First, loss of load expectation studies have confirmed that installed capacity requirements can be reduced by additional transmission that links different regions together, and can achieve the same long-term reliability target.[12] Stronger transmission connections would allow for more coordinated resource planning across regions, which would result in the need for less installed resource capacity than if the individual regions would independently plan to their own reliability

[9] *Id.* at 11.

[10] *Id.* at 7-8.

[11] *Id*.

[12] *Id.* at 16.

targets.[13] As one example, Sierra Club witness Milligan conducted a study that showed the Western Interconnection would require 60 fewer Gigawatts of generation with a strong inter-regional transmission system.[14] Relatedly, other studies have found that wind generation with a strong transmission connect to load has a significantly higher capacity value than wind energy without such transmission, measured by effective load carrying capability ("ELCC"), a common metric used to describe the reliability contribution of a resource or group of resources.[15] Simply put, the same reliability target can be achieved with a smaller installed capacity if transmission constraints are reduced or eliminated. This reduced capacity requirement will tend to lower costs for customers.

Second, construction of the Grain Belt Express line will provide broader access to generation projects when Missouri utilities plan to meet their reserve margin requirements. In planning to meet reserve margin requirements, each load-serving entity ("LSE") requires that a particular generator be capable to deliver power to the entity's service area or the zone of the regional grid, i.e., MISO Zone 5 for Ameren Missouri. When transmission is constrained, the ability of developers to bid for projects is also constrained. When the constraints are removed, competition is fostered, allowing LSEs to benefit from a broader pool of potential projects. This outcome would improve resource adequacy, reduce costs, or both.[16] The Grain Belt Express line will increase the availability and diversity of generation projects from which Missouri utilities could procure power.

[13] *Id*. at 16.

[14] *Id.* at 16-17.

[15] *Id.* at 16.

[16] *Id.* at 17-18.

Third, day-to-day operational reliability will be enhanced by the stronger links between regions that would help the grid to respond to disturbances, such as the loss of a large generator.[17] In general, larger electrical areas are better equipped to respond to such disturbances without impacting the stability the grid. The Grain Belt Express will therefore enhance day-to-day stability of the MISO and SPP grids.

IV. The Grain Belt Express Will Provide Significant Resilience Benefits to Missouri's Electric Customers.

The Grain Belt Express transmission line will improve the resilience of the grids in Missouri in the face of extreme weather. The Grain Belt Express line will link together disparate areas, both in terms of geography and grid regions that include MISO, SPP, and eventually PJM. In effect, that creates a larger geographic/electrical area. This helps make the 'grid larger than the storm,' enabling relatively remote resources not affected by a storm to deliver to load centers within a storm that otherwise might be without power.[18] "Enlarging" the grid is accomplished through strong transmission links to areas that are not affected by the same storm at the same time, or at least not to the same extent, so that unaffected or less affected regions can export into the most-affected regions.

The experience of Winter Storm Uri demonstrates the value of inter-regional transmission to promote resilience. Of the several electric regions affected by Uri, by far the most significantly impacted region was Texas, particularly the area operated by ERCOT. ERCOT's grid has extremely limited interconnection with neighboring areas. Consequently, ERCOT was unable to import significant capacity and experienced lengthy and widespread outages.[19] The impact of Uri

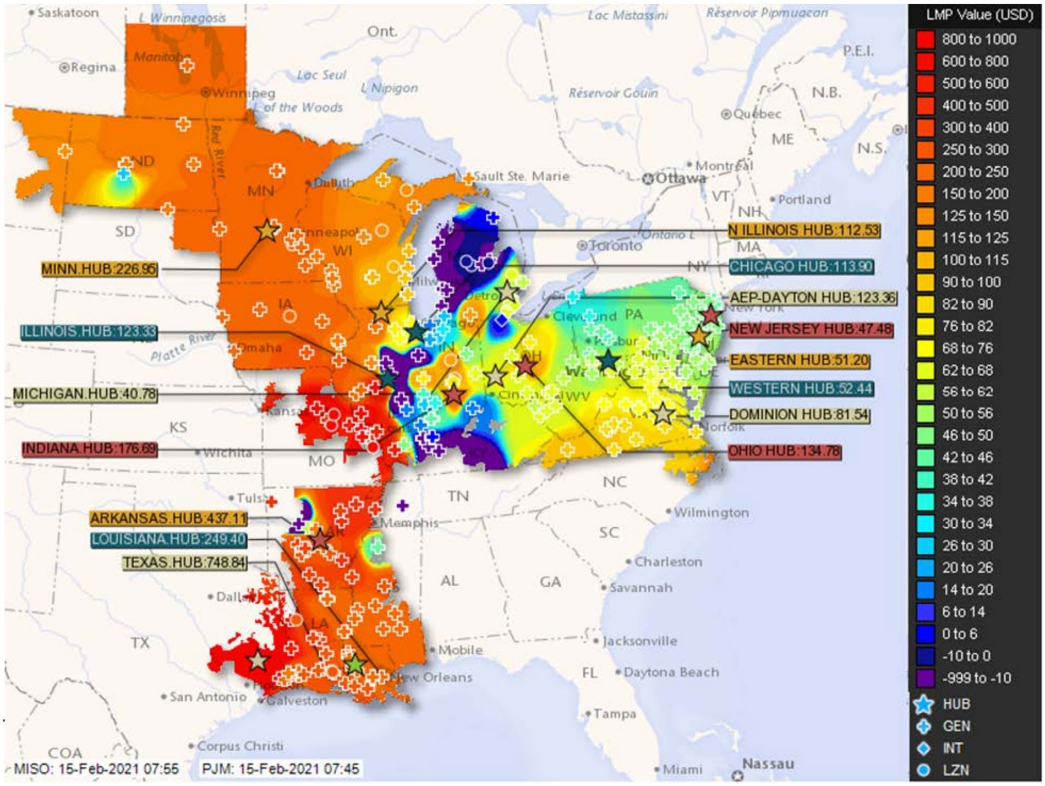
[17] *Id.* at 15.

[18] *Id.* at 19.

[19] *Id.*

on SPP and MISO was less harmful to customers, largely because these grid regions were able to import power from neighboring systems.[20] SPP received thousands of megawatts from PJM and MISO during several critical periods during the event. While MISO had some shortfalls, it was able to mitigate capacity shortages by importing power from other regions.

The extreme price disparities within MISO during Winter Storm Uri demonstrate the need for more transmission to promote resilience. Congestion costs at the MISO-SPP seam nearly reached $2,000/MWh throughout the storm,[21] reflecting a transmission need. Further, prices in Ameren Missouri's region were much higher than neighboring zones in MISO, such as in Illinois, Indiana, and Michigan,[22] reflecting a need for transmission.



[20] *Id.* at 19-20.

[21] *Id.* at 21.

[22] *Id.*

Thus, the construction of the Grain Belt Transmission line will improve Missouri's ability to maintain stable electric service through extreme weather events.

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In sum, Sierra Club respectfully asks that the Commission approve the Grain Belt project.

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing Sierra Club's Post-Hearing Brief was electronically filed on this date via the Missouri PSC's electronic filing system. Notice of this filing will be served upon all parties of record who have registered through this electronic filing system.

Date: July 7, 2023

/s/ Sarah Rubenstein
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