

FILED  
June 27, 2023  
Data Center  
Missouri Public  
Service Commission

# Exhibit No. 1

Grain Belt Express LLC – Exhibit 1  
Shashank Sane  
Direct Testimony  
File No. EA-2023-0017

Exhibit No.:  
Issue(s): Introduction, Applicant  
Background, Project Updates,  
Description of Amendments,  
Economic Feasibility  
Witness: Shashank Sane  
Type of Exhibit: Direct Testimony  
Sponsoring Party: Grain Belt Express LLC  
Southwest, LLC  
File No.: EA-2023-0017  
Date Testimony Prepared: August 24, 2022

**MISSOURI PUBLIC SERVICE COMMISSION**

**FILE NO.**

**EA-2023-0017**

**DIRECT TESTIMONY**

**OF**

**SHASHANK SANE**

**ON**

**BEHALF OF**

**GRAIN BELT EXPRESS LLC**

**August 24, 2022**

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1       **I.       INTRODUCTION**

2           **Q.       Please state your name, present position and business address.**

3           A.       My name is Shashank Sane. I am the Executive Vice President of Transmission  
4 for Invenergy LLC (“Invenergy”). My business address is One South Wacker Drive, Suite 1800,  
5 Chicago, Illinois 60606.

6           **Q.       Please describe your educational and professional background.**

7           A.       I received my Bachelor of Finance & International Business degree from the New  
8 York University Stern School of Business in 2003. I received my Master of Business  
9 Administration degree from the Northwestern University Kellogg School of Management in 2011.

10          I began my career in investment banking with Lehman Brothers, where I worked from  
11 2003 to 2009. After completing my MBA at Northwestern University, I joined Oliver Wyman as  
12 a management consultant focusing on the energy industry. I joined Invenergy in 2013 and have  
13 remained there since that time. During my nine years with Invenergy I have led various functions  
14 including corporate finance, strategy, distributed energy and, since the beginning of 2021,  
15 transmission.

16          **Q.       What are your duties and responsibilities in your present position?**

17          A.       Grain Belt Express LLC (“Grain Belt Express”), the Petitioner in this proceeding,  
18 is a limited liability company organized under the laws of the State of Indiana. Grain Belt Express  
19 is a wholly-owned subsidiary of Invenergy Transmission LLC (“Invenergy Transmission”), a  
20 Delaware limited liability company, which is a wholly-owned subsidiary of Invenergy Renewables  
21 LLC (“Invenergy Renewables”), also a Delaware limited liability company. Invenergy  
22 Transmission and its affiliate company, Invenergy, are global leaders in renewable energy and  
23 transmission development. Invenergy or its affiliates are providing project management support  
24 for Grain Belt Express, including overseeing the financing, design, engineering and construction

1 of the Grain Belt Express transmission line project (“Project”) pursuant to agreements with Grain  
2 Belt Express. Schedule SS-1 is an organization structure chart for Grain Belt Express and its  
3 related and affiliated entities.

4 In my current role as EVP of Transmission for Invenergy, I oversee the development of all  
5 of the transmission projects by Invenergy or its affiliates. In that role, I am overseeing  
6 development of the Project from Kansas to Indiana.

7 **Q. What is the purpose of your testimony?**

8 A. Grain Belt Express is requesting approval from the Missouri Public Service  
9 Commission (“Commission”) to amend its existing certificate of public convenience and necessity  
10 (“CCN”) to construct, install, own, operate, maintain, and otherwise control and manage an  
11 approximately 800-mile, overhead, multi-terminal +/- 600 kilovolt (“kV”) high-voltage, direct  
12 current (“HVDC”) transmission line, and associated facilities including converter stations and  
13 alternating current (“AC”) connector lines (the “Project”). The proposed AC connector line in  
14 Missouri is referred to as the “Tiger Connector.”

15 Specifically, Grain Belt Express seeks Commission review and approval of the following  
16 amendments (*i.e.* “material changes to the design and engineering”, referred to as the “Amended  
17 Project”):

- 18 • Changes to the Missouri converter station’s size (from 500 to 2500 MW) and  
19 location (from Ralls to Monroe County);
- 20 • Moving the AC tie line from Ralls County to Monroe, Audrain and Callaway  
21 Counties. The AC tie line will be approximately 40 miles, traversing south from  
22 the converter station in Monroe county, through Audrain County, and terminating

1 in Callaway County at points of interconnection (“POIs”) at and near the McCredie  
2 Substation (the “Tiger Connector”); and

- 3 • Construction of the Amended Project in two phases. “Phase I” will comprise that  
4 HVDC portion of the Amended Project starting in Ford County, Kansas and  
5 traversing the State of Missouri to the interconnection at the converter station in  
6 Monroe County, and including the AC Tiger Connector, which will traverse  
7 southeast from the Monroe County converter station to the existing McCredie  
8 Substation. “Phase II” is anticipated to comprise that portion of the HVDC  
9 transmission line starting at the Monroe County converter station and ending at the  
10 AEP Sullivan Substation in Sullivan County, Indiana.

11 I am testifying in support of Grain Belt Express’ amendment request. First, I will provide  
12 some background into Grain Belt Express, its affiliates, and its partners assisting with the Project  
13 and discuss the managerial, technical, financial and construction capabilities of Grain Belt Express,  
14 its affiliates, and its partners. Second, I will address the accomplishments and milestones relating  
15 to the Project to date. Third, I will address the requested amendments to the Project. And finally,  
16 I will discuss the economic feasibility of the Project as amended (“Amended Project”).

1           **Q.     Are you sponsoring any schedules or exhibits as part of your direct testimony?**

2           A.     Yes, I am sponsoring the following exhibits/schedules:

- 3           • Schedule SS-1 – Organization structure chart  
4           • Schedule SS-2 – The qualifications and experience of key members of Grain Belt  
5           Express’ management team  
6           • Schedule SS-3 – A chart of Grain Belt Express’ construction management  
7           organization.

8           **Q.     Is Grain Belt Express requesting that the Commission issue an order on the**  
9           **Application by a certain date?**

10          A.     Yes. The Application includes a request for a Commission order by May 31,  
11          2023. I understand this timing is in line with other CCN proceedings that come before the  
12          Commission. The Illinois Commerce Commission (“ICC”), by comparison, is required to issue  
13          an order on Grain Belt Express’ application in Illinois within 225 days from filing, which will be  
14          March 8, 2023. An order from this Commission by May 31, 2023 will facilitate continued  
15          development of the Project, certainty for landowners and other stakeholders, and ongoing  
16          commercial discussions. It will also help to keep the Project on track for the development timeline  
17          discussed in the Direct Testimony of Aaron White.

18          **II.     OVERVIEW OF GRAIN BELT EXPRESS**

19          **Q.     Please describe Grain Belt Express’ existing CCN for the Project.**

20          A.     In Case No. EA-2016-0358, Grain Belt Express Clean Line LLC was given  
21          authority to construct, own, operate, control, manage, and maintain the Project pursuant to the  
22          Commission’s Report and Order on Remand (the “CCN Order”). The Project as authorized in  
23          Case No. EA-2016-0358 is referred to herein as the “Certificated Project.” In Case No. EM-2019-  
24          0150, the Commission approved a transaction in which Invenergy Transmission acquired  
25          ownership of Grain Belt Express Clean Line LLC, and with it, the rights to construct, own, operate,

1 control, manage, and maintain the Certificated Project. The entity name has since been changed  
2 to Grain Belt Express LLC.<sup>1</sup>

3 **Q. Did the CCN issued in Case No. EA-2016-0358 contemplate the possibility of**  
4 **modifications to the Certificated Project?**

5 A. Yes. The CCN was granted to Grain Belt Express with the understanding that any  
6 material changes to the engineering or project design would require an updated application for  
7 Commission approval. The current Application to Amend is being filed in compliance with the  
8 following condition, as incorporated into the CCN Order: “Grain Belt and Invenenergy agreed that  
9 if there are any material changes in the design and engineering of the Project from what is  
10 contained in the application, Grain Belt will file an updated application subject to further review  
11 and determination by the Commission.”<sup>2</sup>

12 **Q. Have the objectives of the Project changed since the CCN Order was issued?**

13 A. No. Although Grain Belt Express is seeking several amendments to the Project,  
14 the primary objective of the Amended Project is the same as that of the Certificated Project: to  
15 transport clean, reliable, low-cost electricity from renewable generation to be built in southwestern  
16 Kansas, which has potential for abundant, high-capacity factor wind and solar resources, to the  
17 electricity markets in Missouri and Illinois and other states located within or adjacent to the MISO  
18 and PJM grids. The main difference between the Certificated Project and the Amended Project is  
19 that the Amended Project provides significantly more benefits to Missouri. The Amended Project  
20 will be capable of delivering up to 2,500 MW of power into the MISO and AECI grids at delivery  
21 points in Missouri, as opposed to 500 MW into the MISO grid under the Certificated Project.

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<sup>1</sup> See, Docket No. EN-2020-0385, *Order Recognizing Name Change*, June 9, 2020.

<sup>2</sup> CCN Order, p. 36.

1           **Q.     What amendments does Grain Belt Express seek to make to the Certificated**  
2 **Project to incorporate material changes in design and engineering?**

3           A.     Grain Belt Express seeks Commission review and approval of the following  
4 amendments (*i.e.* “material changes to the design and engineering”, referred to as the “Amended  
5 Project”):

- 6           • Changes to the Missouri converter station’s size (from 500 to 2500 MW) and  
7 location (from Ralls to Monroe County);
- 8           • Moving the AC tie line from Ralls County to Monroe, Audrain and Callaway  
9 Counties. The AC tie line (the “Tiger Connector”) will be approximately 40  
10 miles, traversing south from the converter station in Monroe county, through  
11 Audrain County, and terminating in Callaway County at points of  
12 interconnection (“POIs”) at the existing McCredie Substation (the AECI  
13 interconnection) and a new substation<sup>3</sup> to be built on the line to Montgomery  
14 (the MISO interconnection) ; and
- 15          • Construction of the Amended Project in two phases. “Phase I” will comprise  
16 that HVDC portion of the Amended Project starting in Ford County, Kansas  
17 and traversing the State of Missouri to the interconnection at the converter  
18 station in Monroe County, and including the AC Tiger Connector, which will  
19 traverse southeast from the Monroe County converter station to the existing  
20 McCredie Substation and a newly constructed substation. “Phase II” is  
21 anticipated to comprise that portion of the HVDC transmission line starting at

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<sup>3</sup> As of the date of this testimony, it is Grain Belt Express’ understanding that the new MISO substation near the existing McCredie substation will be called the Burns Substation.

1 the Monroe County converter station and ending at the AEP Sullivan Substation  
2 in Sullivan County, Indiana.

3 **Q. What progress has been made in the Project?**

4 A. Grain Belt Express has made significant progress in the development of the Project  
5 since its acquisition in 2020. In summary, Grain Belt Express has accomplished the following:

- 6 • Acquired 72% of all easements required for the Kansas and Missouri portion of  
7 the Project.
- 8 • Satisfied, ahead of schedule, the Kansas Corporation Commission’s established  
9 deadlines for easement acquisitions as a condition of retaining siting authority  
10 in Kansas.<sup>4</sup>
- 11 • Achieved approvals from the Indiana Utility Regulatory Commission to  
12 authorize Invenergy Transmission to acquire, own, and operate the Project in  
13 Indiana.<sup>5</sup>
- 14 • Worked with various stakeholders in support of Illinois legislation permitting  
15 Grain Belt Express to file for a certificate of public convenience and necessity  
16 (“CPCN”) at the ICC.
- 17 • Met all prerequisites and prepared and filed its Application for a CPCN at the  
18 ICC, Docket No. 22-0499, filed on July 26, 2022.
- 19 • Worked in cooperation with various agricultural and landowner groups  
20 culminating in the enactment of House Bill 2005.<sup>6</sup>

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<sup>4</sup> Order Granting Joint Motion to Replace Sunset Provisions with Settlement Deadlines, ¶ 11, KCC Docket No. 13-GBEE-803-MIS (September 26, 2019).

<sup>5</sup> “Order from the Commission,” IURC Cause No. 45294 (Jan. 2, 2020).

<sup>6</sup> Available at <https://house.mo.gov/billtracking/bills221/hlrbillspdf/3627S.07T.pdf>.

- 1 • Submitted and advanced interconnection requests at MISO for a point of
- 2 interconnection on Ameren’s McCredie—Montgomery 345 kV line,
- 3 approximately 0.5 miles east of AECEI’s McCredie substation.
- 4 • Signed an interconnection agreement with AECEI for a point of interconnection
- 5 at the McCredie substation.
- 6 • Advanced through the interconnection processes with PJM Interconnection
- 7 (“PJM”) and Southwest Power Pool (“SPP”), respectively.

### 8 **III. THE AMENDED PROJECT IS NEEDED ON AN ECONOMIC BASIS**

9 **Q. Please explain why the requested amendments to the Certificated Project are**  
10 **necessary on an economic basis.**

11 A. Just as with the Certificated Project, the Amended Project will: (a) allow large  
12 amounts of renewable energy from southwestern Kansas to access the MISO markets and compete  
13 to serve customer load; (b) support development of wind and solar facilities where the resources  
14 are such that electricity can be generated at significantly lower cost than are currently available in  
15 Missouri; (c) enable low-cost renewable energy to access the Missouri electricity markets and  
16 reduce wholesale and retail electric prices; and (d) help customers in Missouri and surrounding  
17 states meet their various renewable energy and carbon reduction standards. Additionally, since  
18 2019, the cost of solar development has continued to decline and the solar resources in  
19 southwestern Kansas have been shown to be highly complementary to both wind delivered across  
20 Grain Belt Express as well as solar constructed locally in Missouri. With the Amended Project,  
21 customers in Missouri will have greater access to these benefits than under the Certificated Project  
22 and be able to realize those benefits sooner through a phased construction approach.

1           If the Amended Project is approved, Grain Belt Express is expected to deliver up to 15  
2 million megawatt-hours (“MWh”) of clean energy per year into the Missouri converter station,  
3 and up to 15 million MWh of clean energy into the Illinois converter station. The total annual  
4 deliveries of up to 30 million MWh will be enough to serve the annual electricity needs of over  
5 2.8 million homes.

6           Further, there is a significant demand for electricity supplied by renewable resources, and  
7 more specifically wind and solar generation, in Missouri and surrounding states, and that demand  
8 will continue to grow over the next 20-30 years. The demand is and will continue to be driven by  
9 voluntary utility carbon reduction and renewable resource acquisition commitments; federal laws  
10 and policies limiting, or increasing, the costs of the production of electricity from fossil-fueled  
11 generating plants, resulting in retirements or reduced use of such plants; public demand for clean  
12 energy from renewable sources; and the potential for wind and solar energy as a low-cost,  
13 competitive source of electricity.

14           Large corporate energy customers will contribute to the growing demand for clean energy,  
15 and represent an increasing amount of renewable energy procurement, accounting for 37% of all  
16 carbon free energy added to the grid since 2014. Of the energy deals completed by corporate  
17 customers to date, 22% are within PJM markets and 13% are within MISO markets. The trend of  
18 high demand for carbon free energy continued in 2021 with corporate buyers procuring 11 GW of  
19 power. The demand in 2022 and beyond is projected to exceed the record amount from 2021.<sup>7</sup>

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<sup>7</sup> See Utility Dive, “Corporate clean energy procurement on track for another record year after adding 11 GW in 2021,” available at <https://www.utilitydive.com/news/corporate-clean-energy-procurement-ceba-report/623926/>

1           **Q.     What did the Commission previously find regarding need?**

2           A.     In Case No. EA-2016-0358, the Commission heard evidence regarding Grain Belt  
3 Express' contract with the Missouri Joint Municipal Electric Utility Commission ("MJMEUC")  
4 and made the following conclusions regarding the need for the Project:

5           The Project is needed primarily because of the benefits to MJMEUC and its  
6 customers, who have committed to purchase 136 MW of wind power utilizing  
7 transmission service purchased from Grain Belt. The transmission service  
8 agreement between Grain Belt and MJMEUC allows MJMEUC to purchase up to  
9 200 MW of transmission capacity from the Grain Belt project. MJMEUC plans to  
10 use cheaper wind power from Grain Belt to replace the 100 MW of energy and  
11 capacity it currently purchases from Illinois Power Marketing, which contract will  
12 expire in 2021. MJMEUC calculates that their MoPEP members will save over \$11  
13 million annually under the transmission service agreement with Grain Belt  
14 compared to its existing contract for those Illinois coal resources. These annual cost  
15 savings to MJMEUC member cities that participate in the Project will likely be  
16 passed through to their residential and industrial customers in the form of rate relief  
17 or invested in deferred maintenance to their electrical distribution systems.  
18 The transmission service agreement has recently been amended to lower the price  
19 of the second 100 MW tranche to that of the first 100 MW tranche, resulting in  
20 additional annual savings (for 200 MW) to MJMEUC of approximately \$2.8  
21 million compared to a traditional SPP to MISO point-to-point service agreement.<sup>8</sup>  
22

23           A.     The Commission also heard evidence on the demand for services offered by Grain  
24 Belt Express from the membership of MJMEUC, commercial and industrial customers, and others  
25 within MISO and PJM. The Commission found as follows:

26           Evidently, the elected decision makers for MJMEUC's member cities recognized  
27 a need for these savings, and there was also evidence that wind power transmitted  
28 to Missouri would have been of interest to commercial and industrial customers,  
29 such as Walmart, Missouri Industrial Energy Consumers, the Missouri Retailers  
30 Association, and other national companies.

31           Of course, MJMEUC and Missouri industrial customers are not the only energy  
32 customers we must consider in this analysis. In a state whose regulated utilities  
33 participate in two regional transmission organizations, it is appropriate to consider  
34 the Project's effect on other market participants. There was substantial evidence

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<sup>8</sup> CCN Order, p. 41.

1 of demand for this project, both on the production and delivery side, within the  
2 relevant regional markets.<sup>9</sup>

3 **Q. Is the MJMEUC contract still in place?**

4 A. Yes.

5 **Q. What evidence is there of current demand for the Project, taking into account**  
6 **the expanded capacity of the overall Project and expanded delivery into Missouri?**

7 A. Demand for the Amended Project can be seen on several fronts. First, Grain Belt  
8 Express has entered into Memorandums of Understanding (“MOUs”) with major commercial and  
9 industrial consumers, and electric utilities, each of which has expressed interest in acquiring  
10 transmission capacity from the Project.

11 **Q. What other evidence demonstrates demand for expanding the delivery**  
12 **capabilities of the Project in Missouri?**

13 A. Both Ameren Missouri and Evergy have announced carbon emission reduction  
14 goals, which further demonstrate demand for expanding the delivery capability of the Project.

15 On June 23, 2022, Ameren Missouri filed its 2022 Annual Update to its Integrated  
16 Resource Plan (“IRP”), noting that the Preferred Resource Plan presented in its 2020 Triennial  
17 Integrated Resource Plan should be revised. Ameren states that the new Preferred Resource Plan  
18 represents an acceleration in the retirement of approximately 3,000 MW of coal-fired generation  
19 by the end of 2030, acceleration in the retirement of approximately 1,000 MW of gas-fired  
20 generation, total renewable generation of 3,500 MW by 2030, among other items. These  
21 accelerated transitions and retirements will permit Ameren to achieve greater reductions in carbon  
22 emissions by 2030, in furtherance of its stated goal of net zero carbon emissions.<sup>10</sup>

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<sup>9</sup> CCN Order pp. 41-42.

<sup>10</sup> *Id.* at 3.

1 Ameren’s Annual Update also states that:

2 [As it] considers new wind and solar projects to fulfill the resource needs identified  
3 in the new Preferred Resource Plan, it will be focused on ensuring a regionally  
4 diverse portfolio to mitigate any potential impacts on energy supply due to  
5 variations in weather conditions across geographical locations. With strategic and  
6 proper siting, geographic diversity allows for a smoothing effect across variable  
7 energy resources, allowing for improved reliability. Further, a geographically  
8 diverse energy portfolio is more resilient during unplanned events that would  
9 otherwise negatively impact the electrical system. With a host of viable solar  
10 generation projects currently under consideration, Ameren Missouri will also be  
11 focused on wind generation additions after 2025 to ensure a balanced portfolio  
12 designed to mitigate the variations in generating performance of wind and solar  
13 technology.<sup>11</sup>

14 As Ameren will need additional and diverse supply to meet its new IRP goals, adding  
15 capacity to the Project will help Ameren achieve these goals.

16 Additionally, as noted in Ameren’s Change of Preferred Plan issued in 2022, Ameren  
17 indicated it would accelerate retirement of the Rush Island Energy Center (“Rush Island”) from  
18 2039 to 2025. This will increase Ameren’s need for both new sources of generation and  
19 transmission infrastructure to replace the Rush Island’s contributions to Ameren’s supply of  
20 electricity.

21 Further, Evergy’s IRP, filed with the Commission on April 30, 2021<sup>12</sup>, announced the  
22 acceleration of the company’s carbon reduction timeline. As part of the plan, Evergy will retire  
23 nearly 1,200 megawatts of coal-based fossil generation and add 3,200 MW of renewable  
24 generation in the next 10 years. Within the next three years, the company will retire its Lawrence  
25 (KS) Energy Center and add 700 MW of solar energy. The plan prioritizes sustainability, reliability

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<sup>11</sup> *Id.* at 6.

<sup>12</sup> See Docket No. EO-2021-0035.

1 and cost competitiveness, while advancing Evergy's goal to reduce carbon emissions 70 percent  
2 by 2030 (relative to 2005 levels) and achieve net-zero carbon emissions by 2045.

3 **Q. As the Commission found in Case No. EA-2016-0358, is it still accurate to**  
4 **conclude that there is demand for the Project from municipalities and commercial and**  
5 **industrial customers?**

6 A. Yes. There are a number of businesses operating in Missouri that have expressed  
7 interest in buying renewable power. As a non-exhaustive list, the following companies with  
8 Missouri footprints are members of the Clean Energy Buyers Association and have made certain  
9 commitments to use renewable energy: 3M, Anheuser-Busch Companies, LLC, Burns &  
10 McDonnell, The Boeing Company, Cargill, Emerson, Dow, General Mills, Google LLC, GM,  
11 Ikea, Meta Platforms, Inc.<sup>13</sup>, Nestlé USA, Proctor & Gamble, T-Mobile, Occidental Petroleum  
12 Corporation, Unilever and Walmart, among others.<sup>14</sup> A number of Missouri municipal  
13 governments, including Kansas City,<sup>15</sup> St. Louis City,<sup>16</sup> Columbia<sup>17</sup> and University City,<sup>18</sup> have  
14 also made pledges to increase use of renewable energy in city facilities.

15 **Q. Is there evidence of demand for the Amended Project outside Missouri?**

16 A. Yes. As reported by S&P Global, as of December 4, of 2021, 70% of the 30 largest  
17 U.S. electric and gas utilities have net-zero equivalent targets or were moving to comply with

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<sup>13</sup> Meta Selects Missouri For New \$800 Million Data Center  
<https://www.prnewswire.com/news-releases/meta-selects-missouri-for-new-800-million-data-center-301510294.html>

<sup>14</sup> CEBA Members can be found at <https://cebbuyers.org/about/ceba-members/>.

<sup>15</sup> See more at <https://www.kcmo.gov/Home/Components/News/News/1888/625>.

<sup>16</sup> See more at <https://www.stlouis-mo.gov/government/departments/planning/sustainability/air.cfm>.

<sup>17</sup> See more at <https://www.como.gov/wp-content/uploads/2022/01/2022-Water-Light-Renewable-Plan-Draft-1.pdf>.

<sup>18</sup> See more at <https://www.ucitymo.org/451/Background-Sustainable-Green-Practices>

1 aggressive carbon emission reduction mandates. The vast majority of these utilities reside within  
2 the MISO and PJM footprints.<sup>19</sup> In support of its regional transmission planning efforts MISO  
3 also commissioned a study by Applied Energy Group to assess the clean energy goals of utilities  
4 within its footprint through 2040.<sup>20</sup> 28 MISO utilities have Carbon Reduction goals and 26 have  
5 Renewable Energy goals. It will not take long for the best renewable resource zones within the  
6 MISO footprint to be fully developed to serve these needs. Imports from adjacent regions, such  
7 as southwest Kansas and SPP will be sorely needed. The Project, as amended, also will have the  
8 capability to delivery energy into MISO South via its AECI interconnection.

9 On July 11, 2022, the Tennessee Valley Authority (“TVA”) requested up to 5,000  
10 megawatts of carbon-free energy that must be operational before 2029, which is one of the largest  
11 clean energy procurement requests in the nation. Per its press release,

12 TVA is executing a defined strategy to reduce carbon from 2005 levels by 70% by  
13 2030, 80% by 2035, and aspire to be net-zero by 2050. To support its carbon-  
14 reduction efforts, the agency is aggressively exploring and accelerating carbon-free  
15 technologies and moving to bring an additional 10,000 megawatts of solar energy  
16 capacity online by 2035.<sup>21</sup>  
17

18 The Amended Project, through its AECI interconnect, could be a potential transmission  
19 source for this additional energy need.

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<sup>19</sup><https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/path-to-net-zero-70-of-biggest-us-utilities-have-deep-decarbonization-targets-61622651>

<sup>20</sup><https://cdn.misoenergy.org/20211117%20RRA%20Workshop%20Utility%20Research%20Final%20Report604642.pdf>

<sup>21</sup> Tennessee Valley Authority, “TVA Issues One of the Nation’s Largest Requests for Carbon-Free Energy” (July 12, 2022) (<https://www.tva.com/newsroom/press-releases/tva-issues-one-of-the-nation-s-largest-requests-for-carbon-free-energy>).

1       **IV. THE AMENDED PROJECT IS NEEDED ON A RELIABILITY AND**  
2       **RESILIENCY BASIS**

3       **Q. Are you providing testimony on Project need with respect to reliability and**  
4       **resiliency?**

5       A. Yes, my testimony will summarize how the Amended Project meets reliability and  
6       resilience needs and will discuss in detail the special role that interregional transmission, like the  
7       Grain Belt Express Project, can mitigate the impact of extreme weather. Witness Anthony Petti,  
8       Managing Consultant at Guidehouse Inc., also discusses the reliability and resiliency values  
9       provided by Grain Belt Express in his Direct Testimony and Schedule AP-2 filed simultaneously  
10      with my testimony. Witness Jonathon Monken, Principal at Converge Strategies, LLC, provides  
11      additional analysis about reliability and resiliency values under the lens of national security in his  
12      Direct Testimony and Schedule JM-2, both also filed simultaneously with my testimony.

13      **Q. Please explain why the requested amendments to the Certificated Project are**  
14      **necessary with respect to reliability and resiliency.**

15      A. Government and industry sources, such as the North American Electric Reliability  
16      Corporation (“NERC”) and the Department of Energy (“DOE”) have recognized that there is a  
17      strong need to expand and strengthen the overall transmission grid, particularly to support the  
18      movement of electricity generated by renewable resources to areas of market demand and to make  
19      the U.S. power grid more resilient to the impacts of climate change and in the face of national  
20      security threats. Recently, the DOE commented that “insufficient transmission capacity—  
21      especially transmission that facilitates transfer of power across regions—presents another critical  
22      challenge facing the grid.”<sup>22</sup> The DOE stated, “Upgrading and expanding the current transmission

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<sup>22</sup> See U.S. Dept. of Energy, *Building a Better Grid Initiative to Upgrade and Expand the Nation’s Electric Transmission Grid to Support Resilience, Reliability, and Decarbonization*, at 2

1 system will enhance grid reliability and resilience and enable the cost-effective integration of clean  
2 energy.”<sup>23</sup> The DOE noted, “Investment in transmission infrastructure can help protect the grid  
3 against supply disruptions due to physical and cyber-attacks or climate-induced extreme weather,  
4 minimize the impact of supply disruptions when they happen, and re-store electricity more quickly  
5 when outages do occur.”<sup>24</sup> Specifically, the DOE stated, “Expanding transmission capacity also  
6 improves reliability by creating stronger and more numerous energy delivery pathways, helping to  
7 ensure that customers have a dependable source of electricity to power their homes, schools, and  
8 businesses” and will “spur[] economic growth.”<sup>25</sup>

9 The need for additional interregional transmission interconnected to the Midwest, and more  
10 specifically the MISO region, is not based on a theoretical need. In its 2022 Summer Reliability  
11 Assessment NERC outlined grave concerns about expected capacity shortfalls in MISO, putting  
12 the ISO at a “high risk of energy emergencies during peak summer conditions” and further noting  
13 “[m]ore extreme temperatures, higher generation outages, or low wind conditions expose the  
14 MISO North and Central areas to higher risk of temporary operator-initiated load shedding to  
15 maintain system reliability.”<sup>26</sup> I discuss specific examples of recent extreme weather events in  
16 more detail below.

17 As noted earlier, several forces are driving a greater adoption of renewable energy on to  
18 the electric grid. With the increased penetration of renewable resources, geographic diversity of

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(prepub. version Jan. 11, 2022), available at [https://www.energy.gov/sites/default/files/2022-01/Transmission%20NOI%20final%20for%20web\\_1.pdf](https://www.energy.gov/sites/default/files/2022-01/Transmission%20NOI%20final%20for%20web_1.pdf).

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> [https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC\\_SRA\\_2022.pdf](https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf)

1 resources increases the reliability of the electric grid at large. Long-distance transmission lines  
2 offer the ability for states like Missouri to increase the diversity of resources serving the state and  
3 reduce the risk of disruption due to extreme weather events.

4 **Q. How does building a more reliable and resilient grid through interregional**  
5 **HVDC transmission support national security interests?**

6 A. The Department of Defense (“DOD”), with more than 500 installations and 300,000  
7 buildings nationwide, has a substantial dependence on private electricity infrastructure for  
8 maintaining and executing critical missions. Following Executive Order 14057, “Catalyzing Clean  
9 Energy Industries and Jobs Through Federal Sustainability,” the DoD will use its status as the  
10 largest energy consumer in the U.S. to spur the development of at least 10 GW of clean electricity  
11 production by 2030.<sup>27</sup> This includes a target of procuring carbon-free power on a 24/7 basis to  
12 support national defense missions, which will require long-range, cross-regional transmission with  
13 enhanced controllability to meet the DOD’s real-time demand.

14 Russia’s recent invasion of Ukraine has prompted new concerns about national security  
15 and serves as a reminder that accelerating the pace of electrification of the U.S. vehicle fleet and  
16 renewable energy deployment can reduce the nation’s dependence on global fossil fuel markets,  
17 which can be subject to unpredictable price spikes and the influence of unsavory autocratic  
18 leaders.<sup>28</sup> The national security benefits of HVDC transmission is discussed further in the Direct  
19 Testimony of Jonathon Monken and Schedule JM-2.

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<sup>27</sup> <https://www.defense.gov/News/Releases/Release/Article/2921646/dod-gsa-announce-rfi-to-gather-information-for-supplying-247-carbon-pollution-f/>

<sup>28</sup> Rocky Mountain Institute, *From Deep Crisis, Profound Change*, available at <https://rmi.org/insight/from-deep-crisis-profound-change/>.

1           **Q.     How does the Amended Project serve these needs?**

2           A.     The main objective of the Project is to transport clean, low-cost electricity from  
3 renewable generation plants to be built in southwestern Kansas, which has high-capacity factor  
4 wind and solar resources, to the electricity markets in Missouri and Illinois and other states located  
5 within or adjacent to the MISO and PJM grids. The Project will be capable of delivering up to  
6 2,500 MW of power into the MISO and Associated Electric Cooperative, Inc. (“AECI”) grids at a  
7 delivery point in Missouri and up to 2,500 MW of power into the PJM grid at a delivery point in  
8 western Indiana. This extra transmission capacity will both help meet regional energy needs and  
9 diversify sources of energy across the region.

10           The Project, and the Amended Project in particular, provide MISO and AECI customers  
11 access to a large quantity of generation resources outside of the geographic boundaries of those  
12 balancing authorities. As those regions look to add resources quickly to address reliability  
13 concerns, existing plant retirements and customer demand for renewable resources, the Project  
14 will be a valuable tool to access as wide a pool of resources as possible.

15           Additionally, the wind and solar production of generation in southwestern Kansas is not  
16 strongly correlated with the production of wind and solar generators in Missouri and Illinois. As a  
17 result, integrating wind and solar generation resources in southwestern Kansas with Missouri and  
18 Illinois wind and solar generation facilities—which the Project will make possible—will reduce the  
19 overall variability of renewable generation serving Missouri and Illinois, increase the reliability of  
20 renewable generation as a supply source to Missouri and Illinois markets, and reduce the costs of  
21 renewable generation integration into the Missouri and Illinois supply portfolio.

22           Grain Belt Express is a multi-generational energy project. As such, it will be capable of  
23 delivering even further benefits from future technological advancement such as higher efficiency

1 wind and solar technology, long duration energy storage and green hydrogen production. Despite  
2 the superior renewable generation resources available in southwestern Kansas, prospects for the  
3 addition of new renewable generation facilities in the area are limited because of the lack of  
4 adequate long-distance, inter-regional transmission infrastructure to bring electricity to load and  
5 population centers, such as Missouri and Illinois. For new, low-cost renewable generation to be  
6 constructed in southwestern Kansas to meet the demand for renewable resources in Missouri and  
7 other states, additional long-distance transmission capacity between these areas must be built. The  
8 Project will provide this needed long-distance transmission capacity.

9 Referring back to some of the challenges listed in the previous answer, the Amended  
10 Project will help meet the demand spurred by governmental policy and customer demand by  
11 increasing access to geographically diverse renewable resources supported by the Project. The  
12 Amended Project will help the United States better manage external supply shocks like the war in  
13 Ukraine because major new transmission lines such as Grain Belt Express are necessary to build  
14 new domestic renewable energy in a quantity sufficient to reduce the state and national exposure  
15 to global energy supplies and prices.<sup>29</sup> Finally, the Amended Project will help ensure that  
16 developers of clean energy have a mechanism to transmit energy to populations centers and allow  
17 for the construction of new generation assets.

18 **Q. Are there recent examples of severe weather impacts that could have been**  
19 **mitigated by projects like Grain Belt Express?**

20 A. Unfortunately, there are multiple such examples. During Winter Storm Uri in  
21 February 2021, more than 4.5 million people in Texas lost power (some for as long as four days)

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<sup>29</sup> See Direct Testimony of Johnathon Monken for a detailed review of the national security impacts of the Amended Project.

1 while being exposed to below-freezing temperatures for over six days. At least 210 people died.  
2 Each additional 1 GW of transmission ties could have saved in excess of \$100 million for  
3 customers served in the great plains by SPP and in the southern part of the geographic area served  
4 by MISO and could have kept the heat on for hundreds of thousands of Texans.<sup>30</sup>

5 The southcentral U.S. served by MISO and SPP also faced emergency circumstances but  
6 were able to mitigate disaster by importing power from PJM and MISO respectively. Such  
7 capacity transfer, while far from entirely sufficient, demonstrated the importance of capacity  
8 transmission and interconnection between ISOs/RTOs. In a recent Notice Inviting Post-Technical  
9 Conference Comments,<sup>31</sup> FERC noted the importance of being able to import and export energy  
10 between regions to address climate change and extreme weather events.

11 Further, the DOE issued a Notice of Intent under its “Building a Better Grid Initiative”,  
12 which explains that modernizing, hardening, and expanding the grid is necessary to protect against  
13 the “increasing frequency of extreme weather events” which “is leading to energy supply  
14 disruptions that threaten the economy, put public health and safety at risk, and can devastate  
15 affected communities all over the country.”<sup>32</sup>

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<sup>30</sup> See Grid Strategies, LLC, Transmission Makes the Power System Resilient to Extreme Weather, AMERICAN COUNCIL ON RENEWABLE ENERGY (July 2021) ([https://acore.org/wp-content/uploads/2021/07/GS\\_Resilient-Transmission\\_proof.pdf](https://acore.org/wp-content/uploads/2021/07/GS_Resilient-Transmission_proof.pdf)) at 11.

<sup>31</sup> Docket No. AD21-11-000, (January 7, 2022).

<sup>32</sup> See U.S. Dept. of Energy, *Building a Better Grid Initiative to Upgrade and Expand the Nation’s Electric Transmission Grid to Support Resilience, Reliability, and Decarbonization*, at 2 (prepub. version Jan. 11, 2022), available at [https://www.energy.gov/sites/default/files/2022-01/Transmission%20NOI%20final%20for%20web\\_1.pdf](https://www.energy.gov/sites/default/files/2022-01/Transmission%20NOI%20final%20for%20web_1.pdf).

1           **Q.     Are there other examples?**

2           A.     Yes. Per the Washington Post, July 2022 was the nation’s third hottest July on  
3 record, and the hottest month in the last 128 years in terms of nighttime warmth.<sup>33</sup> July  
4 temperatures in Kansas, Missouri and Illinois were all rated as “above average,” with regions of  
5 Kansas and Missouri experiencing mean temperatures that were “much above average.”<sup>34</sup> While  
6 Missouri utilities were able to avoid rolling blackouts this summer, utilities had to issue  
7 conservation messages due to high temperatures,<sup>35</sup> while others saw blackouts due to equipment  
8 failure.<sup>36</sup>

9           SPP issued a Conservative Operations Advisory for July 6 through 8 amidst the record-  
10 setting electricity use and high temperatures.<sup>37</sup> PJM also issued several load shed directives to AEP  
11 in mid-June, as well as hot weather alerts, most recently from July 22 to 24, 2022.<sup>38</sup> Further

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<sup>33</sup> Zach Rosenthal and Jason Samenow, *July 2022 featured hottest nights in U.S. history*, THE WASHINGTON POST, August 10, 2022 (<https://www.washingtonpost.com/climate-environment/2022/08/10/hottest-us-nights-july-climate/>).

<sup>34</sup> *Id.*

<sup>35</sup> Greta Cross, *Utility companies in the Ozarks ask customers to conserve water, energy during heat warnings*, SPRINGFIELD NEWS-LEADER, July 9, 2022 (<https://www.news-leader.com/story/news/2022/07/09/utility-companies-ask-customers-save-water-energy/10006556002/>).

<sup>36</sup> Matt Evans, *Energy demand soars in KC metro with heatwave*, KMBC News, June 14, 2022 (<https://www.kmbc.com/article/energy-demand-soars-in-kansas-city-heatwave/40290416#>).

<sup>37</sup> SPP, *Southwest Power Pool keeps the lights on as region sets new record for electricity use*, July 8, 2022, (<https://www.spp.org/newsroom/press-releases/southwest-power-pool-keeps-the-lights-on-as-region-sets-new-record-for-electricity-use/>).

<sup>38</sup> See PJM, *June 14 – June 16 Operational Review*, July 14, 2022, (<https://www.pjm.com/-/media/committees-groups/committees/oc/2022/20220714/item-03---june-14-16-operations-review.ashx>); and PJM, *Emergency Procedures: Hot Weather Alerts (July 21 and 22, 2022)*, (<https://emergencyprocedures.pjm.com/ep/pages/dashboard.jsf>).

1 South, Electric Reliability Council of Texas (“ERCOT”) reported that it exceeded 80,000  
2 megawatts for the first time and set demand records 11 times this summer.<sup>39</sup>

3 **Q. How will the Amended Project mitigate extreme weather impacts to the grid?**

4 A. As discussed in greater detail in the testimony of Anthony Petti and in the  
5 Guidehouse Report at Section 3, adding transmission capacity and energy diversity to the region  
6 will help mitigate these types of events in myriad ways. First, when one RTO is under an  
7 emergency condition, interregional transmission links such as Grain Belt Express create the ability  
8 to pull resources from other RTOs who are likely not facing such an emergency. Second,  
9 increasing supply will help utilities meet increased demand, reducing the risk of equipment failure,  
10 insufficient load, and reliance on conservation messaging. Third, increased supply will cause  
11 comparatively lower pricing, reducing the burden on individuals and businesses who will use more  
12 energy in summer months. Fourth, increasing transmission capabilities from clean energy  
13 abundant communities will encourage development of domestic renewable energy and reduction  
14 of traditional energy sources that contribute to climate change and are exposed to global pricing  
15 dynamics. Fifth and finally, because the Amended Project will incorporate HVDC technology, it  
16 will have black-start capability and under emergency conditions will be able to reverse course and  
17 transmit power from east to west—a capability unique to HVDC projects, which will enable the  
18 impacted grids to restabilize and recover faster than those only serviced by AC transmission.

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<sup>39</sup> Matt Harab, *ERCOT says power grid exceeded 80,000 MW for first time as Texas heat wave continues*, HOUSTON PUBLIC MEDIA, July 21, 2022 (<https://www.houstonpublicmedia.org/articles/news/energy-environment/2022/07/21/428816/ercot-says-grid-exceeded-limit-for-the-first-time-as-heat-wave-continues/>).

1           **Q.     Given the reliability and resiliency benefits associated with interregional**  
2 **transmission, why aren't more interregional transmission lines being planned via traditional**  
3 **planning processes?**

4           A.     FERC's Order No. 1000 attempted to address interregional coordination and  
5 planning but designing and implementing projects to address system needs across transmission  
6 planning regions is very challenging. The general view across the industry is that interregional  
7 planning processes are at best, stalled, and at worst, ineffective in identifying valuable projects.  
8 Some of this can be attributed to the level of effort that has been required of planners to implement  
9 transmission planning and cost allocation within their own regions, leaving limited time to focus  
10 on addressing issues with interregional processes but voltage level or project size restrictions,  
11 project type restrictions and the requirement that project meet multiple benefit-to-cost ratio tests  
12 (known as the "triple hurdle"), not to mention debates over cost allocation, have resulted in no  
13 significant interregional transmission projects ever being approved via Order 1000 planning  
14 processes.<sup>40</sup> FERC is currently focused on updates to the regional planning process via its NOPR  
15 "Building for the Future Through Electric Regional Transmission Planning and Cost Allocation  
16 and Generator Interconnection," Docket No. RM21-17, but these reforms will not address  
17 interregional transmission.<sup>41</sup> For the foreseeable future, merchant transmission projects like this  
18 Project are the country's only hope to building out transfer capability between regions and  
19 balancing authorities.

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<sup>40</sup> See Americans for a Clean Energy Grid, "Planning for the Future: FERC's Opportunity to Spur More Cost-Effective Transmission Infrastructure", pp. 55-57 (January 2021), available at [https://cleanenergygrid.org/wp-content/uploads/2021/01/ACEG\\_Planning-for-the-Future1.pdf](https://cleanenergygrid.org/wp-content/uploads/2021/01/ACEG_Planning-for-the-Future1.pdf).

<sup>41</sup> FERC Docket No. RM21-17-000, Notice of Proposed Rulemaking (April 21, 2022), available at <https://www.ferc.gov/media/rm21-17-000>.

1       **V.     GRAIN BELT EXPRESS AND ITS AFFILIATES ARE QUALIFIED TO**  
2       **CONSTRUCT, OWN, OPERATE, AND MAINTAIN THE PROJECT**

3       **Q.     Does Grain Belt Express have the managerial and technical capabilities to**  
4       **construct and operate the Amended Project?**

5       A.     Yes, as the Commission previously found in 2019,<sup>42</sup> Grain Belt Express has the  
6       ability to develop, construct, and operate the Project. The management team of Grain Belt Express  
7       includes executive, professional and technical personnel who have managed, built and financed  
8       projects in the transmission, renewable and traditional energy sectors. The management team has  
9       financed billions of dollars of energy projects and managed the development of projects that  
10      produce or transmit thousands of megawatts of power. Members of the management team have  
11      had management, engineering and other supervisory roles in the construction of transmission lines.  
12      The qualifications and experience of key members of Grain Belt Express' management team are  
13      provided in Schedule SS-2.

14           In addition to the management team already in place, Grain Belt Express will assemble a  
15      proficient construction management team to properly execute an engineering, procurement and  
16      construction ("EPC") contract appropriate for a project of this magnitude. Key positions in Grain  
17      Belt Express' management team will include, but are not limited to, Project Managers,  
18      Superintendents, Project Controls, Safety Managers, Material Managers, Quality Managers, Field  
19      Engineering Managers, Environmental Compliance Managers, Right-Of-Way ("ROW")  
20      Managers, Land Liaison Managers and Community Relations. A chart of Grain Belt Express'  
21      construction management organization is provided as Schedule SS-3.

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<sup>42</sup> Report & Order on Remand, Docket No. EA-2016-0358 (March 20, 2019).

1           The construction management team’s responsibility is to deliver a successful project on  
2 time, within budget, at the highest quality, while upholding safety and minimizing environmental  
3 and other impacts to land. Grain Belt Express will also continue to engage local communities prior  
4 to the start of any construction by, for example, holding project awareness meetings at local  
5 facilities to allow the public and the EPC contractor(s) to meet. These meetings will serve several  
6 purposes, including the following: (i) communicating to the public the details of the construction  
7 activities, sequencing and proposed schedules; and (ii) affording Grain Belt Express the  
8 opportunity to learn about and/or firm up local suppliers and service providers in the area that may  
9 be utilized on the Project. On July 11<sup>th</sup> Invenergy Transmission coordinated with PAR/Quanta to  
10 host a supplier social event in St. Louis, MO where representatives provided a presentation on the  
11 scope, size, services and resources that will be needed to construct the Project. Attendees included  
12 suppliers who offer a variety of services across the route area and state-wide. Invitations were  
13 sent to about 50 suppliers<sup>43</sup>, and about 40 individuals attended, representing 30 supplier  
14 companies. Grain Belt Express will seek to continue to maximize the use of local contractors and  
15 suppliers where practicable.

16           Grain Belt Express’ management team will assign a land liaison to the Project to  
17 communicate with landowners prior to entry on their properties, during construction operations  
18 and after construction activities are completed to address any concerns and maintain consistent  
19 communications. All in compliance with the conditions set forth in the Certificated Project and  
20 adopted in the CCN Order. These positions will be filled by employees who have experience in

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<sup>43</sup> Invited suppliers include Agricycle, Altec, ASP Enterprises, Bates Utility, CCI Effingham, Collins and Hermann, Concrete Strategies, Consolidated Pipe, DIG Castle, DJM Ecological Services, Fred Weber Building Products K&K Supply, Keeley Construction, Kiewit, Kimaterials, Kuesel, McGrath & Associates, Inc., Michaels, Millstone Weber, Nucor Harris Rebar, PAR, POWER Engineers, Rubin Brown, Safety International, Silver Eagle Construction Products, SITE, Terracon, Traffic Control Company, United Rentals, and Safety International.

1 both the construction industry and, in this case, working knowledge of agriculture practices. This  
2 dual knowledge base will aid in conducting successful construction operations across agriculture  
3 lands.

4 The management team for Grain Belt Express will manage the conceptual design of the  
5 transmission line. Grain Belt Express will also manage the engagement of one or more EPC  
6 contractors to oversee the three major components of the Project development: the converter  
7 stations, the transmission line and the interconnection (both at the generators and at the point of  
8 interconnection with SPP, AECI, MISO and PJM). The EPC contractor(s) will manage  
9 subcontractors to meet project-specific goals on a schedule that Grain Belt Express manages and  
10 oversees.

11 Grain Belt Express will also contract with an industry specialist to ensure quality control  
12 of all Project components.

13 Grain Belt Express' delivery system for this EPC project encourages optimization of  
14 construction operations. It is standard industry practice for vertically-integrated electric utilities  
15 to contract with EPC contractors for major infrastructure development projects like the Project.

16 More information about Grain Belt Express' capabilities can be found in the testimony of  
17 Aaron White.

## 18 VI. THE AMENDED PROJECT IS ECONOMICALLY FEASIBLE

19 Q. Is the Amended Project economically feasible?

20 A. Yes, it is. In 2019, the Commission found that the Project is economically feasible  
21 because the Project links customers in Missouri who desire to purchase low-cost wind power from

1 western Kansas with wind generation companies who supply the power.<sup>44</sup> The economic modeling  
2 remains the same, though demand from customers and utilities has grown significantly in recent  
3 years, as stated above in the economic need section. There is also a significant interest in wind  
4 development in Kansas as evidenced by the many GW of projects in SPP's queue. This interest  
5 will only grow given the recent passage of the Inflation Reduction Act.

6 Although the revised projected cost of the entire Amended Project (\$4.95 billion) is higher  
7 than the 2016 projected cost (\$2.35 billion), the Amended Project remains economically feasible  
8 because the cost of alternative resources has also significantly increased, while the demand for  
9 renewable energy continues to grow. Accordingly, even with the higher projected cost, the energy  
10 and capacity offered by Grain Belt Express is more economically attractive than the alternatives.

11 **Q. What evidence is available to demonstrate that the energy and capacity offered**  
12 **by Grain Belt Express is more economically attractive than the alternatives?**

13 A. As part of this Application to Amend, Grain Belt Express is offering testimony  
14 from PA Consulting Group, Inc. ("PA Consulting") who have prepared a detailed economic  
15 analysis of the Amended Project, including its effects on pricing, supply, and demand.<sup>45</sup> PA  
16 Consulting found that the Amended Project will lower energy and capacity costs in Missouri by  
17 approximately 6.1% (over \$17.6 billion, on an undiscounted basis) over the 2027-66 period. These  
18 savings are more than sufficient to cover the cost to build the Project.

19 Additionally, the recently signed into law Inflation Reduction Act provides a long-term  
20 federal incentive in the form of production tax credits or investment tax credits for the wind and

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<sup>44</sup> Report & Order on Remand, Docket No. EA-2016-0358, pp. 43-44 (March 20, 2019).

<sup>45</sup> See Schedule MP-2 to Repsher Direct Testimony.

1 solar resources that will be built in Kansas, thereby further increasing the competitiveness of those  
2 resources.

3 Furthermore, there is no local alternative that can deliver the value that the Project  
4 provides. The Project provides access to 2,500 MW or more of high capacity wind resources in  
5 southwest Kansas. Such a quantity of wind energy is not available locally in Missouri today – nor  
6 does there seem to be much interest in doing so. The MISO interconnection queue shows 0 MW  
7 of wind projects currently under study in Missouri.<sup>46</sup> There are two projects in the GIA execution  
8 stage, but they represent a fraction of the demand for wind from regional utilities and cannot  
9 compare to the 2,500 MW that will be made available via the Project. The potential exists for  
10 wind resources to be entered into later MISO queues but given the low capacity factor available in  
11 the majority of the MISO Missouri region it is unlikely that a large quantity of such projects will  
12 be developed in the near future.

13 Wind energy is a key resource to achieve deeper penetration of renewable energy in a  
14 region due to its high capacity factor and lack of correlation to solar resources. When combined  
15 with solar resources in southwest Kansas, the Project is capable of economically and reliably  
16 delivering renewable energy at a 70% capacity factor, representing a baseload type resource. And  
17 there is significant interest in developing both wind and solar in Kansas with approximately 7GW  
18 of wind and 10GW of solar currently lined up in the SPP queue in that state.<sup>47</sup> The capacity in the

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<sup>46</sup> See SPP's Interactive Queue available at <https://www.spp.org/engineering/generator-interconnection/>.

<sup>47</sup> See MISO's Interactive Queue available at [https://www.misoenergy.org/planning/generator-interconnection/GI\\_Queue/gi-interactive-queue/](https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/gi-interactive-queue/).

1 SPP queue likely underestimate the interest in developing wind and solar in Kansas due to the lack  
2 of available transmission in key resource areas.

3 **Q. Will customers be willing to pay the transportation costs of Grain Belt Express**  
4 **to move power from Kansas?**

5 A. Yes, as discussed above Grain Belt Express has entered into several MOUs with  
6 various parties and the discussions around the MOUs included pricing that incorporates the current  
7 projected cost of the Project. These MOUs are a clear demonstration both of the interest in and  
8 need for the Project.

## 9 VII. OVERVIEW OF THE *TARTAN* FACTORS

10 **Q. Are you familiar with the Commission’s factors for granting a CCN, referred**  
11 **to as the “*Tartan* Factors”?**

12 A. It is my understanding that in its review of CCN applications, the Commission has  
13 traditionally applied several criteria, which it refers to as the “*Tartan* Factors.” These factors are:

- 14 • There must be a need for the service;
- 15 • The applicant must be qualified to provide the proposed service;
- 16 • The applicant must have the financial ability to provide the service;
- 17 • The applicant’s proposal must be economically feasible; and
- 18 • The service must promote the public interest.

19 **Q. Could you briefly summarize how Grain Belt Express meets each of these**  
20 **factors?**

21 A. Yes, I can. For a start, Grain Belt Express is offering a number of witnesses to  
22 support various elements of the *Tartan* factors. My testimony directly addresses the economic and  
23 reliability/resiliency need for the Project, Grain Belt Express’ qualifications, and the economic

1 feasibility of the Project. As summarized below, other witnesses also address these Tartan Factors  
2 and others.

3 A. There is a Clear Need for the Amended Project

4 **Q. Is the Amended Project needed?**

5 A. Yes, from a number of different perspectives, this Amended Project is needed. First,  
6 from an economic perspective, current and projected demand confirm that there is a significant  
7 need for the clean power supplied by the Project, sufficient to expand the line capacity.

8 Further, as mentioned above in Ameren's IRP and below regarding the need for increased  
9 resiliency and reliability, the extreme weather events experienced throughout the country in the  
10 last year or so have increased demand for more stable supplies of energy and increased resource  
11 diversity from Missouri customers and Missouri utilities. Adding capacity to the Project and  
12 redesigning the line to facilitate connections to the Tiger Connector will assist in meeting that  
13 demand.

14 The proposed amendments are also necessary to satisfy Missouri's and the Country's  
15 growing needs from a reliability and resiliency perspective. As detailed in the testimonies of Grain  
16 Belt Express witnesses Anthony Petti and Jonathan Monken, increasing the line capacity of the  
17 Project is critical to enhancing regional reliability and furthering national security interests relating  
18 to domestic production of electricity and grid stability.

1 B. Grain Belt Express is Qualified to Construct, Operate, and Maintain the  
2 Amended Project

3 Q. Does Grain Belt Express have the managerial and technical capabilities to  
4 construct, operate, and maintain the Amended Project?

5 A. Yes, as stated in more detail above, and as the Commission previously found in  
6 2019,<sup>48</sup> Grain Belt Express has the ability to develop, construct, and operate the Project. The  
7 management team of Grain Belt Express includes executive, professional and technical personnel  
8 who have managed, built and financed projects in the transmission, renewable and traditional  
9 energy sectors.<sup>49</sup> The management team has financed billions of dollars of energy projects and  
10 managed the development of projects that produce or transmit thousands of megawatts of power.  
11 Members of the management team have had management, engineering and other supervisory roles  
12 in the construction of transmission lines. Grain Belt Express will assemble a proficient  
13 construction management team to properly execute an EPC contract appropriate for a project of  
14 this magnitude.<sup>50</sup>

15 As exemplified by the detailed testimony provided by each Grain Belt Express witness in  
16 this proceeding, Grain Belt Express relies on a number of extremely qualified experts to build this  
17 Project. For additional information on Grain Belt Express' qualification relating to this factor, see  
18 the Direct Testimony of Aaron White.

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<sup>48</sup> Report & Order on Remand, Docket No. EA-2016-0358 (March 20, 2019).

<sup>49</sup> See Schedule SS-2.

<sup>50</sup> See Schedule SS-3.

1 C. Grain Belt Express has the Financial Ability to Construct, Own, Operate  
2 and Maintain the Amended Project

3 **Q. Does Grain Belt Express have the financial ability to complete the Amended**  
4 **Project?**

5 A. Yes, it does. As stated in Rolanda Shine’s testimony, Grain Belt Express has the  
6 financial ability to develop, construct, and operate the Project. Grain Belt Express and its affiliates  
7 have a strong record of financing transmission projects and have developed and financed over  
8 4,000 miles of transmission and collection lines, 88 substations, 96 generator step-up transformers  
9 and over 5,000 pad mount transformers over the past 20 years. Grain Belt Express has a clear and  
10 viable plan to raise the capital necessary to construct the Project, both from contracting with future  
11 users of the line and through debt and equity capital. The Commission previously found that Grain  
12 Belt Express had the financial ability to complete the Certificated Project in 2019,<sup>51</sup> and should  
13 do so again here.

14 D. This Amended Project is Economically Feasible

15 **Q. Is this Project economically feasible?**

16 A. Yes, it is. As stated in more detail above, economic modeling continues to support  
17 the Commission’s findings in 2019—that the Project links economic centers of demand in  
18 Missouri with low-cost suppliers in Kansas. Since 2019, that demand from customers and utilities  
19 has grown tremendously. The production tax credits (“PTC”) and investment tax credits (“ITC”)  
20 offered in the Inflation Reduction Act will only increase the amount of generation seeking to  
21 interconnect to the Project and further saturate the current Kansas market. Adding transmission  
22 capacity to move this low-cost energy out of Kansas to other population centers will lower costs

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<sup>51</sup> Report & Order on Remand, Docket No. EA-2016-0358 (March 20, 2019) at 42-43.

1 for consumers regionally, allowing the entire region to benefit from these low cost sources of  
2 power.

3 In addition to my testimony, Grain Belt Express engaged PA Consulting to perform an  
4 analysis of the market impacts of the Project, as detailed in the testimony of Mark Repsher. PA  
5 Consulting found the Project will create significant savings for regional customers and help  
6 Missouri meet climate and reliability goals over the coming years. With these savings in mind,  
7 the Project will provide economic benefits to the wholesale power market, which will ultimately  
8 serve to pay for the cost of the construction and operation of the Project.

9 E. The Amended Project is in the Public Interest

10 **Q. Is the Amended Project in the public interest?**

11 A. There are myriad public interests that are advanced by the Amended Project. Dr.  
12 David Loomis' testimony describes the economic, fiscal, and employment benefits of the  
13 Amended Project. Mark Repsher outlines the economic benefit of the Amended Project to  
14 Missouri customers and the reduced cost of energy across the region. Anthony Petti details how  
15 the Amended Project furthers the public interest in energy reliability and resilience. Jonathan  
16 Monken addresses how the Amended Project benefits national security interests. Witnesses  
17 Andrew Burke, Kevin Chandler, and Jen Stelzleni also provide testimony on how Grain Belt  
18 Express meets public interest goals in balancing the benefits of building a low-cost, high-efficiency  
19 line with the challenge of reducing potential impacts on nearby landowners and habitats.

20 **Q. What did the Commission find with regard to the public interest of the Project**  
21 **in 2019?**

22 A. Among other things, the Commission stated:

23 There can be no debate that our energy future will require more diversity in  
24 energy resources, particularly renewable resources. We are witnessing a  
25 worldwide, long-term and comprehensive movement towards renewable

1 energy in general and wind energy specifically. Wind energy provides great  
2 promise as a source for affordable, reliable, safe, and environmentally-  
3 friendly energy. The Grain Belt Express Project will facilitate this  
4 movement in Missouri, will thereby benefit Missouri citizens, and is,  
5 therefore, in the public interest.<sup>52</sup>

6 **Q. Is this statement still accurate?**

7 A. Very much and more so. As detailed throughout my testimony, we are running  
8 headlong into an energy crisis, primed by aging or absent infrastructure, and magnified by global  
9 changes to the climate. Further, because of the nature of our global energy economy, the United  
10 States has once again proved vulnerable to external supply shocks, this time in the form of a land  
11 war in Europe and embargos on Russian energy supplies.<sup>53</sup> More positively, as a country, we are  
12 just now beginning to see national attention paid to energy transmission, inspired in large part by  
13 the incredible challenges we face and have faced in the last several years. The Project remains a  
14 critical part of the worldwide, long-term and comprehensive movement towards renewable energy  
15 and in meeting and overcoming the challenges we have confronted in recent years. Therefore, the  
16 Commission's language in 2019 is clearly still very accurate.

## 17 **VIII. CONCLUSION**

18 **Q. Does this conclude your testimony?**

19 A. Yes, it does.

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<sup>52</sup> CCN Order, p. 47.

<sup>53</sup> For more information on the national security aspects of this Project, see the testimony of Jonathan Monken.

**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 ) File No. EA-2023-0017  
Maintain a High Voltage, Direct Current )  
Transmission Line and Associated Converter )  
Station )

**AFFIDAVIT OF SHASHANK SANE**

1. My name is Shashank Sane. I am the Executive Vice President of Transmission for Invenergy LLC (“Invenergy”). My business address is One South Wacker Drive, Suite 1800, Chicago, Illinois 60606.

2. I have read the above and foregoing Direct Testimony and the statements contained therein are true and correct to the best of my information, knowledge, and belief.

3. Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.

DocuSigned by:  
*Shashank Sane*  
E8477BE2851C419

Shashank Sane  
Executive Vice President of Transmission  
Invenergy LLC

Date: 8/24/2022