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Case No.: EA-2023-0017
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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. : EA-2023-0017

CROSS-SURREBUTTAL TESTIMONY

OF

MICHAEL GOGGIN

SUBMITTED ON BEHALF OF:

CLEAN GRID ALLIANCE

May 15, 2023

1 **Q: Please state your name and job title.**

2 **A:** My name is Michael Goggin, and I am a Vice President at Grid Strategies LLC, a
3 consulting firm based in the Washington, D.C. area.

4 **Q: For whom are you testifying?**

5 **A:** I am testifying on behalf of Clean Grid Alliance.

6 **Q: Have you previously testified in this case?**

7 **A:** Yes, I provided rebuttal testimony.

8 **Q: What is the purpose of your surrebuttal testimony?**

9 **A:** The purpose of my testimony is to respond to Staff witnesses Eubanks and
10 Stahlman's reasons for rejecting GBX witness Repsher's analysis in Schedule MR-
11 2. In addition, I respond to Staff witness Poudel's rejection of Ameren Missouri's
12 and Evergy's integrated resource plans as being drivers of the need for the Grain
13 Belt Express Project.

14 **Q: What is your reaction to claims made by Staff witnesses Stahlman (rebuttal**
15 **testimony pages 4-7) and Eubanks (rebuttal testimony pages 14-15) that the**
16 **generation that will interconnect to the Grain Belt Express line cannot be**
17 **accounted for in the analysis because the application is for the**
18 **transmission project and not the generation that will utilize the line?**

19 **A:** I have spent the last 15 years working on transmission expansion to access
20 renewable resources. In my experience, new lines to high-quality renewable
21 resource areas, like the Kansas resource accessed by Grain Belt Express, are fully
22 subscribed, if not oversubscribed, immediately upon completion. This is even more
23 certain to be true now, given that the long-term extension and expansion of the

24 wind, solar, and storage federal tax credits provided by the Inflation Reduction Act
25 guarantees the interconnected resources will be highly cost-effective when Grain
26 Belt Express becomes operational. It is also necessary for transmission expansion
27 to precede generation expansion, given that the timeline required to permit and
28 build transmission is significantly longer than that for renewable generators.

29 **Q: What is your reaction to Staff witness Stahlman’s claims (rebuttal**
30 **testimony pages 6-7) regarding how consumers will be affected by the**
31 **renewable generation delivered via Grain Belt Express?**

32 **A:** Staff witness Stahlman correctly explains that the additional supply of energy and
33 capacity delivered via Grain Belt Express will reduce energy and capacity market
34 prices, but notes that fixed costs associated with building generation and
35 transmission must also be recovered from ratepayers. My Rebuttal Testimony
36 distinguishes between these two factors in explaining how Grain Belt Express has
37 multiple distinct benefits for customers. I agree with Staff Witness Stahlman that
38 “If it is assumed that the project and additional generation is constructed, and that
39 the energy/capacity will be injected into MISO, then using basic supply curve shifts,
40 it is obviously true that energy and capacity prices will go down,” as he correctly
41 notes at page 5 of his Rebuttal Testimony. That is particularly true for wind and
42 solar resources that bid into wholesale energy markets at zero or negative prices,
43 due to their lack of fuel cost. Because they are more productive, renewable
44 resources delivered to Missouri via the Grain Belt Express line will add more supply
45 into wholesale energy and capacity markets than renewable resources built in

46 Missouri, so they cause larger reductions in prices and thus greater benefits to
47 consumers.

48 Outside of these wholesale market impacts, a generators' fixed costs are
49 recovered through Power Purchase Agreements (PPAs), which are bilateral
50 agreements between a generator and load. My testimony explains that Grain Belt
51 Express allows Missouri utilities and other customers to sign lower-priced PPAs by
52 accessing more productive wind and solar resources in Kansas.¹ More productive
53 resources are able to recover their fixed costs across more MWh sold to the
54 customer, reducing the price at which each MWh can be sold.² My testimony
55 confirms that wind and solar resources in Kansas have much lower PPA prices
56 than resources in Missouri. More productive wind and solar resources also
57 generate more federal production tax credits, revenue that directly reduces the
58 remaining costs that must be recovered through the PPA price, further reducing
59 the PPA price that productive resources can offer to customers.³ As a result,
60 accessing highly productive Kansas renewable resources via Grain Belt Express
61 not only causes greater reductions in wholesale energy and capacity market prices
62 by adding more supply, but also allows Missouri customers to sign lower-priced
63 PPAs.

64 **Q: What does Staff witness Stahlman (rebuttal testimony page 7) argue**
65 **regarding the market price and emissions impact of renewable generation?**

66 **A:** He incorrectly claims that

¹ Rebuttal Testimony of Michael Goggin Submitted on behalf of: Clean Grid Alliance, at 6-9 (April 19, 2023).

² CGA Rebuttal, Goggin, at 5 and 8.

³ CGA Rebuttal, Goggin, at 9.

67 Additionally, the impact of generation that fluctuates hour to hour may
68 ultimately increase prices. The injection of wind or other intermittent
69 energy in a given area can result in the energy markets needing more
70 expensive generation that can handle the ramping up and down of
71 energy supply. Such generation is often more inefficient, which can
72 paradoxically result in higher emissions, not less. A comparable
73 example is the fuel efficiency of a vehicle at highway speeds
74 compared to the same vehicle in stop-and-go traffic.

75 **Q: What is your reaction to those claims?**

76 **A:** Those misconceptions about the impact of renewable energy were debunked
77 many years ago by analysis from National Laboratory experts and others. Detailed
78 analysis by the National Renewable Energy Laboratory showed that renewable
79 resources' variability does not significantly reduce their emissions benefits, and
80 can actually increase those benefits,⁴ debunking a myth that was originally
81 propagated by the fossil fuel industry.⁵

82 Lawrence Berkeley National Laboratory has shown that historically⁶ and
83 moving forward,⁷ adding zero-fuel-cost renewable energy significantly reduces
84 wholesale market prices. As noted above, Witness Stahlman also correctly notes
85 that additional supply in wholesale energy and capacity markets inherently reduces
86 market prices.

87

⁴ NREL, "The Western Wind and Solar Integration Study Phase 2" at vii and 109-115 (Sept. 2013); *available at*: <https://www.nrel.gov/docs/fy13osti/55588.pdf>.

⁵ The Power Line, "Fact check: Bryce, Bentek miss on emissions" (July 20. 2011); *available at*: <https://cleanpower.org/blog/fact-check-bryce-bentek-miss-on-emissions/>.

⁶ Lawrence Berkeley National Laboratory, "Impact of Wind, Solar, and Other Factors on Wholesale Power Prices," at 47 (Nov. 2019); *available at*: https://eta-publications.lbl.gov/sites/default/files/lbnl_-_wind_and_solar_impacts_on_wholesale_prices_approved.pdf.

⁷ Lawrence Berkeley National Laboratory, "Impacts of High Variable Energy Futures on Wholesale Electricity Prices, and on Electric Sector Decision Making," at vii and 21-23 (May 2018); *available at*: https://eta-publications.lbl.gov/sites/default/files/report_pdf_0.pdf.

88 **Q: What do Staff witnesses Stahlman and Eubanks claim regarding the**
89 **capacity value accreditation of resources delivered via Grain Belt Express?**

90 **A:** Staff witness Eubanks claims that Grain Belt Express would alleviate MISO’s 1,230
91 MW capacity shortfall, “only if the project is actually delivering capacity from
92 resources other than solely wind and solar.”⁸ Staff witness Stahlman also
93 discusses how “the proposed capacity factor of 74 percent is much higher than
94 what MISO or SPP accredit for a renewable resource,”⁹ though I believe he is
95 confusing capacity factor and capacity value.

96 **Q: What is your reaction to these claims?**

97 **A:** Under MISO’s recently approved capacity accreditation methods, wind and solar
98 receive much higher accreditation than indicated by the table on page 15 of the
99 Rebuttal Testimony from Staff witness Eubanks. That table cites a 16.6% capacity
100 value for wind and a 35% capacity value for solar, though under MISO’s old
101 accreditation methods solar actually received a 50% default capacity value, not
102 35%.¹⁰ Under MISO’s current default accreditation method, wind is accredited at
103 18.1% of nameplate capacity for Summer 2023, 23.1% for Fall 2023, 40.3% for
104 Winter 2023-2024, and 23.0% for Spring 2024, while solar receives a default 50%
105 capacity credit in spring, summer, and fall, and 5% in winter.¹¹

⁸ Missouri Public Service Commission Staff, Rebuttal Testimony of Claire M. Eubanks, at 14:21-22 (April 19, 2023).

⁹ Missouri Public Service Commission Staff, Rebuttal Testimony of Michael L. Stahlman, at 6:13-14 (April 19, 2023).

¹⁰ See MISO, “Planning Year 2022-2023: Wind and Solar Capacity Credit” at 1 (Jan. 2022); *available at*: <https://cdn.misoenergy.org/2022%20Wind%20and%20Solar%20Capacity%20Credit%20Report618340.pdf>.

¹¹ MISO, “Planning Year 2023-2024: Wind and Solar Capacity Credit” at 1 (March 2023); *available at*: <https://cdn.misoenergy.org/2023%20Wind%20and%20Solar%20Capacity%20Credit%20Report628118.pdf>.

106 The installed capacity of wind and solar resources connected to Grain Belt
107 Express is also expected to significantly exceed the capacity of the line, so
108 resources delivered via the line will provide an even higher total capacity credit. As
109 noted on page 6 of Repsher's report, around 9,300 MW of nameplate wind and
110 solar capacity (6,021 MW of wind plus 3,262 MW of solar) can be interconnected
111 to the 5,000 MW Grain Belt Express line because of the synergies between wind
112 and solar resources due to the negative correlation in the timing of their output.
113 Energy storage resources can also be interconnected to Grain Belt Express, which
114 will further increase the capacity value of generation delivered via the line and
115 facilitate the interconnection of even more wind and solar resources while keeping
116 curtailment at an economically acceptable level.

117 Based on those facts, the accredited capacity value of resources delivered
118 via the line is more than enough to fully offset MISO's 1,230 MW capacity shortfall,
119 contrary to the claim made by Witness Eubanks. Specifically, under MISO's default
120 capacity accreditation values, 6,021 MW of wind and 3,262 MW of solar delivered
121 via Grain Belt Express would provide a combined summer capacity credit of 2,721
122 MW and a winter capacity credit of 2,590 MW. These default values are likely a
123 conservative estimate of the capacity accreditation MISO would give these
124 resources once they have been operating long enough for MISO to use historical
125 output data to calculate their capacity accreditation instead of using the default
126 value. Highly productive resources like those available in Kansas tend to have a

127 higher capacity value.¹² In addition, the Kansas resource area’s position
128 significantly west of the primary load centers in MISO helps ensure solar output is
129 available to meet peak demands later in the afternoon and evening, relative to
130 solar resources farther east in MISO’s footprint.

131 **Q: What is your reaction to Staff witness Poudel’s claims (rebuttal testimony**
132 **pages 2-3) regarding the treatment of Grain Belt Express in Integrated**
133 **Resource Plans (“IRPs”) from Ameren and Evergy?**

134 **A:** As I explained in my Rebuttal Testimony, Ameren’s 2022 update to its 2020 IRP
135 calls for adding 3,500 MW of renewables by 2030,¹³ while Evergy’s 2022 update
136 to its 2021 IRP calls for adding 3,540 MW by 2032,¹⁴ for a total of over 7,000 MW
137 of new renewable capacity. These plans confirm that large renewable purchases,
138 including via Grain Belt Express, are the lowest-cost option for supplying Missouri
139 ratepayers.

140 Ameren’s 2020 IRP also favorably evaluated a scenario with 1,000 MW of
141 wind delivered via the Grain Belt Express. The IRP found the Grain Belt Express
142 scenario offered a comparably low cost to its preferred approach, which purchases
143 the same amount of renewable capacity, but it scored the Grain Belt Express plan
144 slightly lower than its preferred plan because it was given a lower score for

¹² Elsevier Energy Economics vol. 56, “System-friendly wind power: How advanced wind turbine design can increase the economic value of electricity generated through wind power,” at 62 (available online on March 3, 2016); *available at*: <https://neon.energy/Hirth-Mueller-2016-System-Friendly-Wind-Power.pdf>.

¹³ Goggin Rebuttal Testimony, at 23, *citing* Ameren Missouri, “2022 Change in Preferred Plan: Integrated Resources Plan,” at 3, *available at*: <https://www.ameren.com/-/media/missouri-site/files/environment/irp/2022/preferred-plan.ashx#:~:text=Ameren%20Missouri's%20new%20Preferred%20Resource,generation%2C%20total%20renewable%20generation%20of>.

¹⁴ Goggin Rebuttal Testimony, at 23, *citing* Evergy, “2022 IRP Update” at 2 (June 10, 2022), *available at*: <https://investors.evergy.com/IRP2022>.

145 regulatory certainty.¹⁵ However, since the 2020 IRP, regulatory uncertainty has
146 already been greatly reduced by the Project receiving approvals from Illinois and
147 other states, and any remaining risk will be further reduced if the Missouri
148 Commission approves this amendment to the CCN.

149 Evergy's IRP notes that:

150 With regards to renewable resources in the southwest Kansas
151 region, it is known that the total current firm transmission service
152 requests to SPP exceed the total transmission service availability
153 which will be provided by transmission construction projects. Until
154 large scale investments in transmission upgrades are made, the
155 timing of future renewable resource additions in that region will be
156 difficult to determine with certainty. This could lead to output and/or
157 delivery limitations on future renewable resource additions in the
158 southwest Kansas region.¹⁶

159 This confirms that Grain Belt Express is essential for accessing the low-cost
160 renewable resources available in southwest Kansas.

161 **Q: Does that conclude your testimony?**

162 **A:** Yes.

¹⁵ Missouri PSC Docket No. EO-2021-0021, Ameren Missouri, 2020 IRP, Chapter 10, at 11, 22 (Sept. 27, 2020); *available at*:

https://efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=EO-2021-0021&attach_id=2021003713

¹⁶ Missouri PSC Docket No. EO-2021-0035, Evergy Metro, Supply-side Resource Analysis Integrated Resource Plan, at 40-41, (April 30, 2021); *available at*:

<https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=936352823>.

**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) Case No. EA-2023-0017

AFFIDAVIT OF MICHAEL GOGGIN

I, Michael Goggin, being duly sworn, declare under oath as follows:

1. My name is Michael Goggin. I am a Vice President at Grid Strategies LLC, a consulting firm based in the Washington, D.C. area. I make this affidavit in support of testimony being submitted in the above captioned docket before the Missouri Public Service Commission on behalf of Clean Grid Alliance.

2. Attached hereto is my Cross-surrebuttal Testimony, labeled as ***Cross-Surrebuttal Testimony of Michael Goggin Submitted on Behalf of: Clean Grid Alliance***, that consists of a cover page, and 8 pages of questions and answers.

3. The aforementioned document was prepared by me or under my direction and control.

4. I have personal knowledge of the facts set forth in the document.

5. If I were asked under oath the same questions posed therein, including my schedules, I would provide the same answers contained therein.

o. The answers provided in the attached testimony, including my schedules, are true and correct to the best of my knowledge and belief.

Further, affiant sayeth naught.



Michael Goggin

District
STATE OF COLUMBIA

COUNTY OF N/A

Subscribed and Sworn or Affirmed before me

this 15th day of May 2023.



Notary Public

My Commission expires: 10/14/2026



ARTHUR J. BURKETT
Notary Public, District of Columbia
My Commission Expires 10/14/2026