

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

**In the Matter of the Application of Grain)
Belt Express Clean Line LLC for Certificate)
of Convenience and Necessity Authorizing it)
to Construct, Own, Operate, Control,)
Manage and Maintain a High Voltage,)
Direct Current Transmission Line and an)
Associated Converter Station Providing an)
Interconnection on the Maywood-)
Montgomery 345 kV transmission line)**

Case No. EA-2016-0358

MOTION OF GRAIN BELT EXPRESS TO SUPPLEMENT THE RECORD

Grain Belt Express Clean Line LLC (“Grain Belt Express” or “Company”), pursuant to 4 CSR 240-2.130(16), moves that the attached Exhibit 140 be admitted into evidence with regard to the 55% wind capacity factor that is the subject of Missouri Landowners Alliance's (“MLA”) Motion to Strike.

In support of this motion, the Company states as follows:

1. On April 27, 2017 MLA filed its Motion to Strike Certain Matieral [sic] in Reply Brief of Grain Belt Express. MLA objected to Attachment A of the Reply Brief, which contained certain verified responses that Grain Belt Express provided to MLA’s First Data Requests to David Berry. These responses related to the 55% capacity factor for Kansas wind and to hourly energy profiles for wind generation in western Kansas, and are contained in the Responses to MLA Data Requests DB.87 and DB.91.

2. MLA objected to Attachment A as an impermissible attempt to refer to matters that were not formally admitted into evidence or as an improper attempt to supplement the record. Although, as explained in its Opposition to MLA’s Motion to Strike, there is other evidence in the record that supports the 55% wind capacity factor, Grain Belt Express must

defend itself against the untrue claim by MLA that Mr. Berry “fails to provide any support at all for this critical figure.” See MLA Brief at 19. MLA argued: “the mere use of the 55% capacity factor, without any explanation why that figure is reasonable, should be given no credence by the Commission.” Id.

3. Schedule DAB-5 to Mr. Berry's direct testimony (Exhibit 104) did list 55% as the assumption for Kansas wind capacity, just as it listed 35% for the assumed capacity of Missouri wind. During discovery MLA asked Mr. Berry to provide additional support for his use of the 55% Kansas wind capacity factor, which he did. This is the information that is contained in Attachment A to the Company's Reply Brief, and which is attached here as Exhibit 140.

4. Under 4 CSR 240-2.130(16), the “presiding officer may require the production of further evidence upon any issues.” Furthermore, the rule states: “The presiding officer may authorize the filing of specific evidence as a part of the record within a fixed time after submission, reserving Exhibit numbers, and setting other conditions for such production.” Given the fact that the 55% capacity factor issue was a relatively uncontested assumption during the evidentiary hearing, but has now leaped to the forefront because of MLA's allegations, the Company requests that the Commission make Exhibit 140¹ a part of the record in this case.

5. Admission of Exhibit 140 is consistent with Section 386.410.1, which states that “in all investigations, inquiries or hearings” the Commission “shall not be bound by the technical rules of evidence.” The Courts have long held that “[t]he Commission has broad discretion in evidentiary determinations.” Deaconess Manor Assoc. v. PSC, 994 S.W.2d 602, 611 (Mo. App. W.D. 1999).

¹ Exhibit 140 is the next number in the sequence of Grain Belt Express exhibits. Exhibit 139 was admitted as a late-filed exhibit on April 11, 2017.

6. Exhibit 140 provides valuable information that will be of assistance to the Commission in judging Mr. Berry's testimony and the evidence regarding the 55% Kansas wind capacity factor. These responses have been verified by Michael Skelly, the President and Chief Executive Officer of the Company, and provide reliable information that is probative of the issues before the Commission.

WHEREFORE, Grain Belt Express Clean Line LLC requests that Exhibit 140 be admitted into evidence as a post-hearing exhibit pursuant to 4 CSR 240-2.130(16).

Respectfully submitted,

/s/ Karl Zobrist

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Attorneys for Grain Belt Express Clean Line LLC

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served upon all counsel of record in this case on this 2nd day of May 2017.

/s/ Karl Zobrist
Attorney for Grain Belt Express Clean Line LLC

**Grain Belt Express Clean Line
Exhibit No. 140**

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express)
Clean Line LLC for a Certificate of Convenience and)
Necessity Authorizing it to Construct, Own, Operate,)
Control, Manage, and Maintain a High Voltage, Direct) Case No. EA-2016-0358
Current Transmission Line and an Associated Converter)
Station Providing an interconnection on the Maywood-)
Montgomery 345 kV Transmission Line)

Grain Belt Express Response to Missouri Landowners
Alliance First Set of Data Requests Directed To David
Berry

Definitions: for purposes of these data requests the following words and phrases are defined as indicated:

“2014 case” is Case No. EA-2014-0207 at the Missouri Public Service Commission.

“Bluescape” means Bluescape Resources Company LLC and its affiliates

“Clean Line” means Clean Line Energy Partners LLC

“Document” shall be construed in accordance with Missouri Supreme Court Rule 58.01 and shall mean the original and every draft or non-identical copy (whether different from the original because of handwritten notes or underlining or checkmarks on the copy or otherwise) of every paper, electronic record, electronic mail or other record, regardless of origin, location or format, whether sent or received or made or used internally, in whatever form, electronic or otherwise, in the possession, custody, or control of Clean Line, Grain Belt or the person to whom the particular data request is directed, or in the possession, custody or control of the attorneys for Clean Line, Grain Belt or the attorneys for the person to whom the particular data requests are directed.

“Entity” means an individual, a company, a governmental unit or any other form of organization or association.

“Grain Belt” means Grain Belt Express Clean Line LLC

“MJMEUC” means the Missouri Joint Municipal Electric Utility Commission

“National Grid” means National Grid plc, and any and all of its subsidiaries.

“the proposed line” means the HVDC line proposed in this case by Grain Belt.

assuming an average annual capacity factor of 50%?

RESPONSE: (1) The year one transmission service rate for 200 MW of service is \$1,417/MW-month, or \$17,004/MW-year. The expected cost for the 200 MW is \$3.4 million. A 200 MW, 50% capacity factor resource will produce 876 thousand MWh a year, resulting in a per kWh cost of 0.39 cents/kWh.

(2) The year five transmission service rate for 200 MW of service is \$1,534/MW-month, or \$18,406/MW-year. The expected cost for the 200 MW is \$3.68 million. A 200 MW, 50% capacity factor resource will produce 876 thousand MWh a year, resulting in a per kWh cost of 0.42 cents/kWh.

DB.84 Please provide a copy of all documents exchanged between Clean Line or Grain Belt on the one hand, and potential lenders on the other, dealing with the possibility or likelihood of using the expected revenue from the MJMEUC contract as security for construction debt issued by Clean Line or Grain Belt.

RESPONSE: There are no such documents.

DB.86 Who was the individual primarily responsible for compiling the data on the three pages from Exhibit 313 referenced in the preceding item.

RESPONSE: Mr. Berry and analysts working under his supervision.

DB.87 In his direct testimony, page 9 lines 14-16, Mr. Copeland states that you provided him with hourly energy profiles for the wind generation in Western Kansas. With respect to that material, please state the following: (1) the person and organization which developed those energy profiles; (2) a description of how they were developed, including the inputs used in that process; (3) whether these wind profiles were the same as were used in the 2014 case by Messrs. Cleveland and Zavadil; and (4) the time frame used in compiling the underlying data used to derive the hourly profiles for this case.

RESPONSE: 1) Mr. Berry

2) The primary source of the capacity factor for Kansas wind is a meteorological analysis of wind speed data from two anemometers or towers (“met towers”) within 40 miles of the Project’s western converter station. Their locations are near Dodge City, Kansas and near Mullinville, Kansas. Clean Line began collecting data from these sites in late 2011. V-Bar, LLC, a company that provides meteorological and wind resource support to the global wind and solar energy industry, manages and quality controls the climate data obtained from these stations.

For this analysis, the wind data collected from these two stations in 2012 were used to simulate an annual profile because the average wind speeds from these years were closest (within 3%) to the long-term averages of the respective sites.

This wind speed data of the Mullinville and Dodge City sites were applied to the

Vestas V110-2.0 and GE2.0-116 power curves, respectively, adjusted for the typical air density in Kansas at 80m hub height. The gross capacity factors for the Mullinville site was 68.8% and 68.0% for the Dodge City site. Wind speeds were further adjusted down to take out energy losses equivalent to 13% performance losses (from wake and environmental losses, for example). 2% additional electrical losses were removed from the final output of the turbine, and a further random ~5% losses were removed from the final output to mimic turbine availability losses that may reflect actual wind farm conditions due to maintenance or other reasons. The total losses to adjust gross-to-net capacity factor was 19%.

In addition to the above adjustment for losses, I applied a smoothing factor to match the variability of output to observed trends, since the variability of two met towers will overestimate the variability of 4000+ MW of wind production. After this adjustment, the variability closely matched those of 3 existing wind farms within 40 miles of the converter station. The smoothing factor was used to create a high variability and low variability wind generation profile for use in Mr. Copeland's analysis.

Please see EA-2016-0358.GBX response to Show Me-1.2.Berry.Attachment 04.HC

3) No, they are not.

4) The wind data collected from the two met towers were from 2012.

DB.88 Please provide a typical sample page of the data supplied by you to Mr. Copeland, as referenced in the preceding item.

RESPONSE: Please see the "Wind Profiles" tab in EA-2016-0358.GBX response to Show Me-1.2.Copeland.Attachment 14.HC.

DB.89 Has Clean Line allocated any of the capacity yet on its Plains & Eastern line?

RESPONSE: No. Negotiations with participants are underway.

DB.90 If the answer to the preceding item is "yes", please list the following: (a) name of the entity to which any capacity was allocated; (b) MW of capacity allocated to each such entity; (c) the delivery point (Arkansas or TVA) for each such allocation; and (d) the cost of the capacity for each such allocation, including any escalation provisions.

RESPONSE: Not applicable.

DB.91 With reference to page 1 of your Schedule DAB-5, what is the basis for the 55% capacity factor for KS wind?

RESPONSE: The 55% capacity factor for KS wind was derived based on the profile

created from meteorological data from near the Kansas converter station using turbines commercially available today and conservative gross-to-net loss assumptions (as described in DB.87). It is also our expectation that turbine technology will continue to improve between now and when the wind farms will reach commercial operation. 55% is also consistent with the high end of the range of capacity factors used in the Lazard's Levelized Cost of Energy Analysis 9.0 (<https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf>), which is reasonable for one of the best wind resources in the country.

DB.92 At that same page, in calculating the 35% figure for the MO wind capacity factor, what wind speeds did you use, and what was the source of that data?

RESPONSE: The 35% estimate was not the result of a single calculation but multiple data points:

1) Average capacity factors from Missouri wind farms from the past three years (2013-2015) have been approximately 27% (Source: EIA Form 923 2013-2015). However, wind farms installed in 2007-2011 have poor performance compared to the newest turbines installed in 2014. According to the most recent Wind Technologies Market Report (<http://energy.gov/sites/prod/files/2016/08/f33/2015-Wind-Technologies-Market-Report-08162016.pdf>), 2015 capacity factor improvements (Figure 32) between projects that came online in 2014 compared to those that came online in 2007-2011 was approximately 30%. A 30% improvement in turbine performance suggests that new wind farms in Missouri could obtain capacity factors of approximately 35%.

2) The best wind sites in Missouri have 80 meter wind speeds of about 7.25 meters per second, though most areas of the state have lower wind speeds. See EA-2016-3582.GBX response to MLA-92-Berry.Attachment 01. The best wind resource in Missouri is about 1.5 meters per second less than in western Kansas. Taking the midpoint (7.25 m/s) and comparing it to Kansas wind speeds (between 8.5-9.0 m/s, or 8.75 m/s), the power available in Missouri wind ($P_{wind} = \frac{1}{2} \rho A v^3$, where P_{wind} is the amount of power available in wind, ρ is the air density, A is the area covered, and v is the velocity of wind) is about 57% of that of Kansas ($7.25^3/8.75^3=56.9\%$). This implies that the potential energy production at a Missouri wind farm would be approximately 57% of that of western Kansas. With a 55% capacity factor at Kansas, this implies the Missouri wind farm would have a capacity factor of 31.4%.

DB.93 Please provide a copy of all documents exchanged since July 1, 2015 between Clean Line or Grain Belt on the one hand, and Kansas wind developers on the other, regarding prices that the wind developers might charge to load-serving utilities in Missouri (including MJMEUC) for energy to be delivered at the Missouri converter station.

RESPONSE: No such documents exist.

VERIFICATION OF RESPONSE

The answers provided to this Set of Data Requests have been collected from various sources at Clean Line Energy Partners LLC and Grain Belt Express Clean Line LLC, and are true and accurate to the best of my knowledge and belief.

Signed: 

Position: President & CEO

Clean Line Energy Partners LLC

Date: 11/1/16