

EXHIBIT B

Exhibit No.: _____
Issues: Need, Benefits, Economic Feasibility, Financing Plan, Conditions
Witness: David Berry
Sponsoring Party: Grain Belt Express
Clean Line LLC
Type of Exhibit: Direct Testimony
Case No.: EA-2016-0358
Date Testimony Prepared: August 30, 2016

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2016-0358

DIRECT TESTIMONY OF

DAVID A. BERRY

CHIEF FINANCIAL OFFICER, EXECUTIVE VICE PRESIDENT

ON BEHALF OF

GRAIN BELT EXPRESS CLEAN LINE LLC

August 30, 2016

1 for entrance and exit can use the turnpike. Similarly, only shippers that buy service on the
2 Project will be able to use the HVDC line. Because only specific users of the line will pay
3 Grain Belt Express' transmission charge, the Grain Belt Express Project will not cause any
4 increase in transmission rates for entities that do not directly benefit from the line.

5 **Q. Will Grain Belt Express commit not to seek recovery of costs for the Project from**
6 **Missouri ratepayers through MISO or SPP regional cost allocation unless the**
7 **Commission agrees?**

8 A. Yes. Grain Belt Express will not seek to recover costs from Missouri ratepayers through
9 MISO or SPP regional cost allocation without Commission authorization. As the Company
10 agreed in the 2014 Case, such a commitment could be reflected in a condition in the
11 Commission's Order. Absent Commission approval, Grain Belt Express will not recover
12 costs from Missouri ratepayers through regional cost allocation, and will only construct
13 and operate the Project under a participant-funded business model.

14 To be clear, Grain Belt Express is not seeking – and has no plans to seek – regional
15 cost allocation. SPP, MISO and PJM do not currently have a process in place that would
16 allow for the cost-allocation of an interregional project across their three footprints.

17 **Q. How will Grain Belt Express allocate the transmission capacity on the Project?**

18 A. On January 20, 2015, the Company commenced the formal capacity allocation process or
19 “open solicitation” pursuant to FERC's Order Conditionally Authorizing Proposal and
20 Granting Waivers, issued in Grain Belt Express Clean Line LLC, No. ER14-409-000, 147
21 FERC ¶ 61,098 (May 8, 2014), which granted it authority to negotiate bilateral agreements
22 for 100% of the capacity of the Project.

1 The respondents to the open solicitation indicated in their Transmission Service
2 Requests the amount of capacity they wish to purchase, their preferred term of service, and
3 their preferred rate. Respondents also provided information regarding their
4 creditworthiness and the status of their generation projects. Most respondents proposed
5 paying a deposit in order to reserve service on the Project. As described in further detail in
6 Section IV, these transmission service requests indicate that demand for the Project's
7 transmission service to Missouri and to PJM exceeds the size of the Project. The Company
8 will rank bids in order to prioritize negotiations of commercial terms with potential
9 capacity customers based on the information submitted, and will ultimately sign
10 transmission service agreements with one or more of the respondents.

11 In addition, Grain Belt Express opened a supplemental window for transmission
12 service requests in February 2016. MJMEUC submitted two requests, one for 200 MW for
13 transmission from Kansas to Missouri, and the other for 50 MW from Missouri to PJM.

14 **Q. Will entities who do not receive an initial allocation of capacity be able to request**
15 **service on the Project?**

16 A. Yes. The negotiated capacity allocation process described above determines only the initial
17 allocation of the Project's capacity. Any future sale of capacity will be governed by the
18 Company's Open Access Transmission Tariff ("OATT"), just as is the case for traditional,
19 cost of service transmission providers.

20 **Q. Has Grain Belt Express updated FERC since receiving negotiated rate authority**
21 **based on the fact that the delivery capacity of the line has increased?**

22 A. Yes. Grain Belt Express' 2013 application to FERC in Docket Number ER14-409-000
23 contemplated a Project with a total 3,500 MW delivery capacity to both PJM and Missouri.

1 A. Yes. In the 2014 Case, Staff members Daniel Beck (in pages 18-19 of his rebuttal
2 testimony) and David Murray (on page 10 of his rebuttal testimony, which Mr. Beck
3 mentioned on page 22 of his rebuttal testimony) proposed conditions related to the timing
4 of construction and financing of the Project. Grain Belt Express found the suggested
5 conditions to be reasonable and is willing to commit not to install transmission facilities
6 until obtaining commitments for funds sufficient to cover the total Project cost, and to file
7 documentation necessary for the Commission to verify that Grain Belt Express has fulfilled
8 this condition. Grain Belt is willing to work with Staff to develop a similar condition in
9 this proceeding.

10 This condition recognizes that there is a necessary sequence to the development of
11 a large transmission line following the participant-funded model, and that it is essential that
12 Grain Belt Express obtain a CCN as a necessary precondition for obtaining financing to
13 construct the Project. Requiring the filing of financing agreements with the Commission
14 after a CCN is granted allows the Commission and Staff to monitor Grain Belt Express
15 without unduly delaying the development of the Project.

16 **IV. ECONOMIC FEASIBILITY, NEED, AND PUBLIC INTEREST**

17 **a. Description of Western Kansas Wind Resource**

18 **Q. What is the cost of the wind generation in western Kansas that the Project will**
19 **unlock?**

20 A. Wind energy can be produced in western Kansas at an extremely competitive cost. A PPA
21 executed in 2015 for the output of the Cedar Bluff Wind Farm in western Kansas provides
22 a data point supporting pricing in this range. Westar Energy contracted with NextEra
23 Energy resources to procure energy from the Cedar Bluff Wind Farm at \$19.15/MWh

1 escalating at 2% per year over 20 years.⁴ Recent wind procurements have trended
2 downward from this already low level.

3 Since there is no inflation factor (other than a fixed contractual escalator) or fuel
4 cost for wind energy, the price of generation is not subject to unpredictable fluctuation.
5 Based on my experience in developing and building wind farms around the United States,
6 I can confirm that the western Kansas region produces wind-generated electricity at a cost
7 as low as or lower than any other region of the country.

8 **Q. Have you independently confirmed the price of generating wind energy in western
9 Kansas?**

10 A. Yes. In January 2014, the Company completed a Request for Information (“RFI”) to wind
11 generators in western Kansas. The response to the RFI included 14 wind developers
12 developing 26 wind farms totaling more than 13,500 MW. As part of their responses,
13 generators provided indicative PPA pricing, which is their own calculation of their
14 levelized cost of energy. The lowest-priced 4,000 MW of new wind generation was an
15 average of 2.0 cents per kWh flat for 25 years.

16 **Q. Do you believe that there is sufficient demand from generators in western Kansas to
17 fill the line’s capacity?**

18 A. Yes. The results of the open solicitation for capacity conducted by Grain Belt Express and
19 launched in 2015 show strong demand for transmission service to Missouri.

20 Grain Belt Express has received requests for Kansas-Missouri service, Kansas-PJM
21 service, and Missouri-PJM service in the original open solicitation window held in early

⁴ Power Purchase Agreement pricing information accessed via FERC’s EQR Database:
<http://eqrreportviewer.ferc.gov/> (last accessed August 25, 2016).

1 2015 and in a subsequent window held in early 2016 to allow additional requests. Fourteen
2 of the fifteen requests submitted are from wind generators who require new transmission
3 infrastructure to deliver low-cost wind energy from projects under development in and
4 around western Kansas to Missouri, Illinois, and Indiana customers in MISO and PJM. Ten
5 wind generators and one load serving entity have submitted Transmission Service Requests
6 for Kansas-Missouri converter station. The total amount of transmission service that has
7 been requested is 3,524 MW, representing more than six times the available Kansas-
8 Missouri service offered by Grain Belt Express.

9 Fourteen wind generators submitted Transmission Service Requests for 17,301
10 MW of service to the Illinois converter station, or approximately 4.5 times the available
11 Kansas-PJM capacity offered by the Project. The total capacity requested to both MISO
12 and PJM delivery points of the Project was 20,825 MW, almost five times the total
13 available capacity of the Project.

14 A summary of the responses to the open solicitation is attached as **Schedule DAB-**
15 **03.**

16 **Q. Why is it so inexpensive to generate wind power in western Kansas?**

17 A. Western Kansas possesses an excellent wind resource that is among the country's best.
18 Attached as **Schedule DAB-04** is a wind map of the United States prepared by the National
19 Renewable Energy Laboratory ("NREL"), a federal research laboratory that operates under
20 the direction of the U.S. Department of Energy ("DOE"), and AWS Truepower, a leading
21 meteorology firm. The wind map shows that western Kansas has some of the highest wind
22 speeds in the country—routinely between 8.5-9.0 meters per second at 80 meters above the
23 ground, a typical hub height for wind turbines. The map demonstrates that average wind

1 speeds in western Kansas are substantially higher than in Missouri, Illinois, Indiana and
2 other states to the east of Kansas that will be served by the Project. By way of confirmation,
3 Grain Belt Express RFI respondents reported an average wind speed of 8.75 meters per
4 second at 80 meters above the ground.

5 Higher wind speeds lead to a higher capacity factor, meaning that the wind
6 generator runs at a higher average percentage of its maximum power output. For example,
7 a wind turbine with a 2 MW capacity rating can produce a maximum of 2 MW of power
8 under ideal circumstances. The actual power produced varies with wind speed. A wind
9 turbine might produce at a portion of its maximum output if the wind speed at its hub height
10 is 8.0 meters per second (“m/s”). The same turbine might produce at its full power rating
11 with a wind speed of 15.0 m/s and might produce no power with a wind speed of 4.0 m/s.

12 **Q. Do even small differences in wind speed have important consequences for the amount**
13 **of power produced?**

14 A. Yes. The kinetic power potential of wind varies with the cube of the wind velocity. In
15 other words, the power potential varies proportionally to the wind velocity raised to the
16 third power. Consequently, an 8.8 m/s average wind speed site will have, other things being
17 equal, 1.99 times the power potential of a 7 m/s site. This exponential effect substantially
18 reduces the cost of wind energy produced by facilities located in areas with higher average
19 wind speeds. As more energy is produced by a wind turbine, the unit cost of energy
20 decreases, since the upfront capital cost and operating costs can be recovered over a larger
21 number of MWh.

22 **Q. Are there any other factors responsible for the low cost to produce wind energy in**
23 **western Kansas?**

1 A. Yes. The State of Kansas offers two tax incentives, a ten-year property tax exemption and
2 a sales tax exemption, that reduce the tax burden on generators in western Kansas and allow
3 them to produce energy at lower cost. Further, construction costs in Kansas are lower than
4 in many other regions of the country. According to a DOE study, the average construction
5 cost of a wind farm in the “Interior Region” of the United States that includes western
6 Kansas was \$1,640 per kilowatt (“kW”) installed, compared to average costs in other
7 regions of the country of \$2,290 per kW.⁵ This lower construction cost is consistent with
8 my own experience and the experience of other members of the Clean Line management
9 team in constructing wind farms in many different regions in the country. Because of these
10 advantages, western Kansas wind farms can generate electricity at a lower cost than wind
11 farms located farther east in Missouri, Illinois, Indiana, and other target markets for the
12 Grain Belt Express Project.

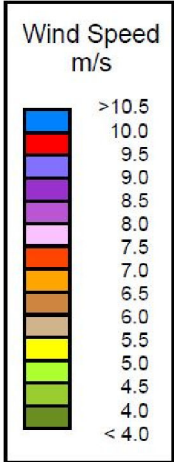
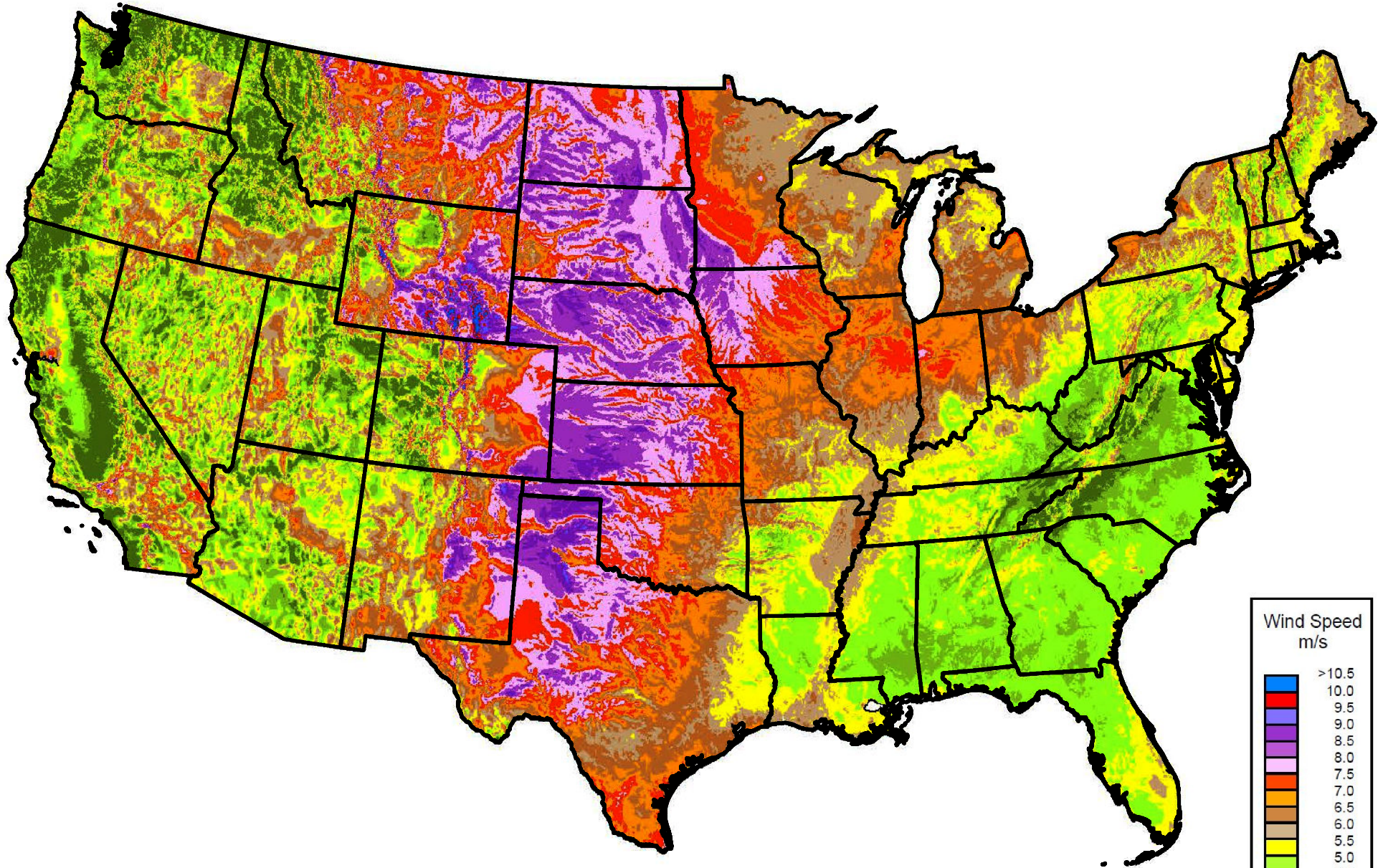
13 b. Cost Comparison of the Project’s Delivered Wind Energy to Other Alternatives

14 **Q. Have you compared the cost of wind energy delivered by Grain Belt Express with**
15 **other sources of energy available to Missouri utilities?**

16 A. Yes. I performed a levelized cost of energy (“LCOE”) analysis to compare the Project’s
17 delivered cost of wind energy to Missouri with other alternatives. Levelized cost of energy
18 (“LCOE”) analysis is the best financial technique to compare different generation sources.
19 LCOE analysis takes into account all costs of generating electricity, including capital costs,
20 operating costs, taxes, the cost of debt, the return on equity, any available subsidies, and
21 necessary transmission additions. The analysis produces a levelized cost per unit of energy

⁵ Lawrence Berkeley National Laboratory, 2015 Wind Technologies Market Report (“2015 Wind Report”), p. 55 & 56, Report PDF and Data File XLS (Figure 43) available at <https://emp.lbl.gov/publications/2015-wind-technologies-market-report> (last accessed on August 25, 2016).

United States - Annual Average Wind Speed at 80 m



Source: Wind resource estimates developed by AWS Truepower, LLC for windNavigator®. Web: <http://www.windnavigator.com> | <http://www.awstruepower.com>. Spatial resolution of wind resource data: 2.5 km. Projection: Albers Equal Area WGS84.