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, control, Manage, Operate and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood 345 kV Transmission Line	)	Case No. EA-2014-0207

Initial Brief of Wind On The Wires and The Wind Coalition

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Table of Contents

BEFORE THE PUBLIC SERVICE COMMISSION 1
OF THE STATE OF MISSOURI 1
I. INTRODUCTION AND STATEMENT OF POSITION 1
II. CRITERIA FOR CERTIFICATE OF CONVENIENCE AND NECESSITY 3
III. ARGUMENT 3
A. Need for Service: The GBE is Needed to Convey Low Cost Wind Energy to Meet Existing and Potential Requirements 3
(1) The GBE is Needed to Deliver Low Cost Wind Energy to Meet State Renewable Energy Requirements 4
(2) The GBE is Needed to Provide Renewable Energy to Comply with Federal Clean Air Requirements 6
(3) The GBE is Needed to Provide Wind Energy that Can Reduce Electricity Price Volatility and Risk 8
(4) The GBE is Needed to Efficiently Deliver Kansas Wind Energy Across the Country 10
B. Public Interest: The GBE and Wind can Lower Electricity Costs and Provide Environmental Benefits 11
(1) GBE and Wind Energy Can Lower Wholesale Electric Costs 12
(2) GBE Interconnect in Missouri can Lower Renewable Energy Costs for Missouri 15
(3) GBE and Wind Energy can Lower Renewable Energy Costs for Missouri 16
(4) GBE and Wind Provide Environmental Benefits 17
C. Economic Feasibility 19
IV. CONCLUSION AND REQUESTED RELIEF 21

Wind on the Wires and The Wind Coalition (jointly referred to as "Clean Energy Intervenors" or "CEI"), by and through its attorney, pursuant to Section 240-2.140 of the Commission's Rule of Practice (4 CSR 240-2.140) and upon the schedule agreed upon by the parties, respectfully submits its' Initial Brief in the above captioned matter.

Clean Energy Intervenors' brief addresses a few key points in the criteria for granting a certificate of convenience and necessity for the Missouri facilities of the transmission line proposed by Clean Line. More specifically, our brief will address the need for, the public interest served by and the economic feasibility of the transmission line ("Grain Belt Express Project" or "GBE Project").

I. INTRODUCTION AND STATEMENT OF POSITION

The Grain Belt Express Project is a unique transmission line that brings the wind energy benefits of the heartland of the United States to the ratepayers in the Midwest and East Coast. GBE Project is high voltage direct current ("HVDC") transmission line approximately 750 miles in length. It originates in southwestern Kansas near Dodge City and crosses Kansas and Missouri to an interconnection location in northeastern Missouri along Ameren Missouri's Maywood to Montgomery 345 kV transmission line. From there the GBE Project continues across the remainder of Missouri and across Illinois to American Electric Power's ("AEP") Sullivan substation in southwestern Indiana. This final point of interconnection provides direct access to the 765 kV network in PJM via two 345/765 kV transformers in AEP's Sullivan 765 kV substation. The GBE Project will be capable of delivering up to 3,500 megawatts ("MW") of power to the PJM market and up to 500 MW of power to the Midcontinent ISO ("MISO") market through interconnections

with the existing transmission grid in Indiana and Missouri, respectively.[1] The project's forecasted in-service date is 2018.[2] Approximately, 206 miles of the approximate 750 mile HVDC transmission line will be in Missouri.[3]

CEI supports the Grain Belt Express Project due to its unique ability to deliver wind from the one of the best wind resource areas in our country -- the Grain Belt -- to two of our country's largest wholesale electric markets -- Midcontinent ISO and PJM. This serves multiple benefits for both Missouri and a large portion of the country. The GBE Project is needed to help many states comply with their state renewable portfolio standards and federal clean air requirements with some of the cheapest wind energy available in the U.S. The wind energy delivered by the GBE Project is also needed by utilities to minimize electricity price volatility due to changes in fossil fuel prices. The GBE Project is in the public interest because it helps MISO, PJM and Missouri meet their electricity and REC needs at a cost that is less than what they would be if the line were not built. The line is economically feasible because it delivers wind energy into Missouri, MISO and PJM at prices equal to or lower than what is currently available. The GBE Project's largest benefit is its unique ability to improve electric market efficiency across a large area.

[1] Exh. 111, Direct Testimony of Dr. Wayne Galli on Behalf of Grain Belt Express Clean Line LLC, at 4 (March 26, 2014).

[2] Id. at 17.

[3] Exh. 100, Direct Testimony of Michael Skelly on Behalf of Grain Belt Express Clean Line LLC, at 3 (March 26, 2014).

II. CRITERIA FOR CERTIFICATE OF CONVENIENCE AND NECESSITY

The key legal standard for granting the Certificate of Convenience and Necessity ("CCN") is captured within Section 393.170.1 (Mo. Rev. Stat. §393.170.1 (August 28, 2014)). The CCN will apply to facilities installed in Missouri, which includes approximately 206 miles of HVDC transmission line and a converter station in Ralls County, Missouri, that will interconnect with the Ameren Missouri transmission line connecting the Maywood and Montgomery 345 kV substations.[4]

The Commission reviews five factors in determining whether to grant a certificate of convenience and necessity application, and generally must find that there is evidence to support the following: (1) There is a need for the service the applicant proposes to provide; (2) The proposed service is in the public interest; (3) The applicant's proposal is economically feasible; (4) The applicant has the financial ability to provide the service; and (5) The applicant is qualified to provide the proposed service. In re Entergy Arkansas, Inc., Order Granting Certificate of Convenience and Necessity, No. EA-2012-0321 (Mo. P.S.C. 2012); In re Tartan Energy Co., 3 Mo. P.S.C. 173, 177 (1994).

III. ARGUMENT

A. Need for Service: The GBE is Needed to Convey Low Cost Wind Energy to Meet Existing and Potential Requirements

Increasing demand for renewable energy will make the Grain Belt Express Project invaluable to Missouri and the country. States in PJM and MISO have renewable energy requirements (*i.e.*, renewable portfolio standards) that extend as far into the future as

[4] Exh. 100, Direct Testimony of Michael Skelly at 3-4.

2026.[5] Missouri's renewable energy standard is effective until 2021, and requires Missouri utilities to purchase at least 15% of their energy from renewable energy sources by 2021.[6] The U.S. Environmental Protection Agency has issued a proposed rule that will significantly increase the need for renewable energy through 2030, particularly in Missouri.[7] Low-cost wind energy from high-quality wind resource areas will keep energy costs low and reduce the risk of electric price volatility.[8] Long-distance, high-capacity transmission lines such as the GBE Project are the most cost-effective method for the delivery of these extremely high-quality wind resources.[9]

(1) The GBE is Needed to Deliver Low Cost Wind Energy to Meet State Renewable Energy Requirements

As of the end of 2013, seven states plus the District of Columbia in the PJM and MISO footprints had renewable energy standards with unmet requirements. The Project's converter stations in Missouri and Central Indiana provide these states access to the low cost wind energy delivered via the GBE Project. The table below estimates the incremental wind capacity needed to be built after 2012 to meet state RES requirements in 2025:[10]

[5] Exh. 700, Rebuttal Testimony of Michael Goggin Submitted on Behalf of Wind on the Wires and The Wind Coalition, at 4 (September 15, 2014).
[6] Id. at 3.
[7] Id. at 10-12.
[8] Id. at 18-19.
[9] Id. at 30-31.
[10] Id., schedule MG-2.

		State	Low Estimate	High Estimate
PJM	2,800-3,750 MW	**DC**	300	400
		DE	100	150
		MD	500	700
		NJ	1,400	1,800
		PA	500	700
PJM/ MISO	3,000 - 4,000 MW	**IL**	3,000	4,000
MISO	2,600 - 3,900 MW	**MO**	1,200	1,800
		MN	1,000	1,500
		WI	400	600
TOTAL:	**8,400 - 11,650 MW**			

Ameren Missouri is the only utility in Missouri that needs to procure renewable energy to comply with the Missouri renewable energy standard ("RES"). As of the end of 2013, it appears that Ameren Missouri has a need for approximately 4,000,000 megawatt-hours ("MWh") of non-solar renewable energy credits ("RECs").[11] Clean Line estimates that approximately 2,200,000 to 2,600,000 MWhs per year could be delivered into Missouri at the Ralls County converter station.[12] If that energy is not entirely purchased by Ameren Missouri it could be purchased by and used for RES compliance in Illinois or Wisconsin.

[11] Id. at 3.

[12] Exh. 118, Direct Testimony of David Berry on Behalf of Grain Belt Express Clean Line LLC, at 12:17 (March 26, 2014).

(2) The GBE is Needed to Provide Renewable Energy to Comply with Federal Clean Air Requirements

States will need access to low cost renewable energy that can be used to comply with the U.S. Environmental Protection Agency's ("U.S. EPA" or "EPA") proposed regulation of carbon dioxide emissions from existing power plants under section 111(d) of the Clean Air Act. The proposed rule is commonly referred to as the Clean Power Plan rule. Section 111(d) requires the U.S. EPA to regulate emissions that cause or significantly contribute to air pollution that may endanger public health or welfare. On June 2, 2014 the U.S. EPA published a draft rule that sets mandatory carbon emission reduction targets for each state, including a target that a state must meet on average over the period 2020-2029, and a final target for the year 2030.[13] A final rule is to be issued in June 2015. Each state will have one to three years to develop a compliance plan (state implementation plan or "SIP"). The amount of time a state has to develop a SIP depends on whether it is developing a plan for itself or in conjunction with other states. The draft Clean Power Plan rule specifically allows for the use of renewable energy as a way to comply with the required carbon emission reduction targets, and EPA has indicated it is likely to allow renewable energy credits to play a key role in demonstrating compliance.[14] However, without new transmission, the lack of transmission access would greatly limit the development of low-cost wind energy resources.

The emission reduction target the U.S. EPA proposes for Missouri would reduce the state's emissions rate from 1,963 lbs of CO2/MWh to 1,544 lbs/MWh by 2030, a

[13] 79 Fed. Reg. 117 at 34830 *et seq*. (June 18, 2014).
[14] 79 Fed. Reg. 117 at 34919 (June 18, 2014).

reduction of 21.3%.[15] In developing the emission reduction target for each state, the EPA assumed that a state would utilize four methods, commonly referred to as "building blocks", to bring a state into compliance under the Best System of Emission Reduction. One of those building blocks is primarily built around the addition of new renewable energy, including wind energy. For Missouri, EPA's "proposed" method of setting the Best System of Emission Reduction assumed the use of approximately 2.8 million MWh of existing and new non-hydroelectric renewable energy by 2030.[16]

The EPA also developed an "alternative" method for estimating the renewable energy that could be used to bring a state into compliance. The alternative method is based on the technical and economic potential of renewable energy by state. Under the alternative method, the EPA assumed that Missouri would use 12.1 million MWh of non-hydroelectric renewable energy[17] on average for the 2020-2029 interim compliance period, and maintain that level into and beyond 2030. That assumption is more than four times greater than what would be needed for compliance under EPA's "proposed" method. It would lower the 2030 emission target level to 1,399 lbs/MWh[18] from 1,544 lbs/MWh, which is the rate under the proposed method.

Missouri and other states would not be able to efficiently use wind from Kansas for compliance with the Clean Power Plan rule due to congestion on the alternating current ("AC") transmission grid. Using the existing AC system would increase state's cost of

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[15] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 10, *citing* http://www.c2es.org/federal/executive/epa/carbon-pollution-standards-map

[16] Id., at 10-11.

[17] Id., at 10-11, *citing* U.S. EPA, Alternative RE Approach Technical Support Document, *which is available at this web address:* http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-alternative-re-approach.pdf

[18] Id., at 11. This number is calculated by inputting the 12.1 million MWhs into this EPA model, *available at this web address*: Data File: Goal Computation - Appendix 1 and 2 (XLS).

complying with the Clean Power Plan, as states would be forced to use other compliance options beyond the point on the supply curve that EPA calculated to be the Best System of Emission Reduction. Moreover, the increased demand for renewable energy credits for use to comply with the Clean Power Plan would significantly increase the price of those credits, unless renewable energy supply were to grow in tandem with the increase in demand. The GBE Project is needed so that low-cost wind energy can be developed, and then used in Missouri and other states to cost effectively comply with the Clean Power Plan rule.[19]

(3) The GBE is Needed to Provide Wind Energy that Can Reduce Electricity Price Volatility and Risk

Wind energy is attractive to utilities and their ratepayers because it is not subject to fuel price volatility, thereby protecting consumers from fluctuations in the price of other fuels. Transmission is also an important mechanism to protect consumers against unpredictable volatility in the price of fuels used to produce electricity. Transmission can alleviate the negative impact of fuel price fluctuations on consumers by making it possible to buy power from other regions and move it efficiently on the grid. This increased flexibility helps to modulate swings in fuel price, as it makes demand for fuels more responsive to price as utilities are able to respond to price signals by decreasing use of an expensive fuel and instead importing cheaper power made from other sources. [20]

[19] Risk of variability in firm point-to-point delivery charges and in congestion costs is discussed in more detail in section III.A(4), *infra.*

[20] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 18-19.

Wind generation provides significant hedging value against fossil fuel price fluctuations.[21] Transmission also provides hedging value against fossil fuel price fluctuations, and that value increases when it connects new wind generation, such as what the GBE Project will do. A recent Lawrence Berkeley National Laboratory report concluded that

> Comparing the wind PPA sample to the range of long-term gas price projections reveals that even in today's low gas price environment, and with the promise of shale gas having driven down future gas price expectations, wind power can still provide long-term protection against many of the higher-priced natural gas scenarios contemplated by the EIA [United States Energy Information Administration]."[22]

Going forward, a robust transmission grid can provide valuable protection against a variety of uncertainties in the electricity market. Fluctuations in the price of fossil fuels are likely to continue, particularly if the electric sector becomes more reliant on natural gas. Further price risk associated with the potential enactment of environmental policies place a further premium on the flexibility and choice provided by a robust transmission grid. As a result, transmission should be viewed as a valuable hedge against uncertainty and future price fluctuations for all consumers.[23]

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[21] Id. at 18.

[22] Id., at 18-19, *citing* Lawrence Berkeley National Laboratory, Revisiting the Long-Term Hedge Value of Wind Power in an Era of Low Natural Gas Prices, page i,(March 2013) *available at* http://emp.lbl.gov/sites/all/files/lbnl-6103e.pdf.

[23] Id., at 19.

(4) The GBE is Needed to Efficiently Deliver Kansas Wind Energy Across the Country

Long-distance, high-capacity transmission lines, such as the GBE Project, are the most cost-effective method for the delivery of these extremely high-quality wind resources.[24] The benefit of the GBE Project is that it delivers wind energy from one of the best wind resource locations to the highest need markets for renewable energy -- MISO and PJM.[25] To deliver electricity across multiple RTOs using the existing AC transmission system would result in pancaking of transmission cost charges that pose significant cost risk for either the generator or end use customer. To deliver electricity from western SPP to PJM using the existing AC transmission system, there are two main costs -- firm point-to-point transmission delivery rates and congestion costs. Firm transmission rates to the SPP/MISO border and from there to the PJM/MISO border are known, however, they are volatile over extended periods of time. For SPP, the cost of firm transmission rights have continuously increased since 2005, sometimes dramatically. Since most power purchase agreements for wind are for twenty years, trying to estimate the increase in price of firm transmission rights in two RTOs and still produce a competitive price for delivery of your product is extremely difficult. Moreover, there is no mechanism for a generator to hedge its financial exposure to continual increases in firm point-to-point transmission rates over twenty years.[26]

The congestion cost is the difference in price between the wind farm and the SPP/MISO border and from the SPP/MISO border to the MISO/PJM border. This cost

[24] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 30-31.
[25] Id. at 21.
[26] Id. at 30.

can be hedged by utilizing financial transmission rights ("FTRs"), but usually the nameplate capacity of a wind project cannot be completely hedged via the free allocation of FTRs that come with a firm transmission path. So a wind generator will be left with some financial risk exposure with regards to both the unhedged portion and the variable cost of purchasing additional FTRs. In addition, there is risk related to future congestion along the route for the twenty year duration of the power purchase agreement. Congestion will change over time as new transmission lines are built and new generation interconnects to the system. Like firm transmission rights, the ability to properly assess the potential future costs of congestion is extremely difficult to nearly impossible.[27]

The GBE Project is needed because it removes these uncertainties by providing a known cost for transmission capacity for a fixed term. Therefore, a wind generator does not need to worry about changes to the firm transmission right or congestion costs.

B. Public Interest: The GBE and Wind can Lower Electricity Costs and Provide Environmental Benefits

The public interest in the GBE Project is its ability to help Missouri, PJM and MISO states meet their electricity and state REC needs at a lower cost than if the line were not built. In addition, the additional wind energy resources will reduce air pollution and enhance environmental quality.

[27] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 31.

(1) GBE and Wind Energy Can Lower Wholesale Electric Costs

In his surrebuttal testimony, GBE witness Cleveland updated the total cost savings and locational marginal price reductions for Missouri in 2019 for four different business scenarios -- Business as Usual, Slow Growth, Robust Economy and Green Economy. They are summarized in the following table[28]:

Scenario	Total Cost Savings ($M)	Reduction in Locational Marginal Price ($/MWh)
Business As Usual	$22	$0.22/MWh
Slow Growth	$11	$0.11/MWh
Robust Economy	$69	$0.67/MWh
Green Economy	$32	$0.30/MWh

These findings are generally consistent with savings predicted in studies that have analyzed the impact of adding wind and transmission to transmission systems.

A European literature review identified a number of studies that have found wind energy tends to drive electricity market prices downward. As that report explains,

> Wind power normally has a low marginal cost (zero fuel costs) and therefore enters near the bottom of the supply curve. Graphically, this shifts the supply curve to the right, resulting in a lower power price, depending on the price elasticity of the power demand…. When wind power reduces the spot power price, it has a significant influence on the price of power for consumers. When the spot price is lowered, this is beneficial to all power consumers, since the

[28] Exh. 117, Surrebuttal Testimony of Robert Cleveland on Behalf of Grain Belt Express Clean Line LLC, sched. RC-2 at 1 (October 14, 2014).

> reduction in price applies to all electricity traded – not only to electricity generated by wind power. [29]

A recent report by the American Wind Energy Association summarizes 15 studies by state governments, grid operators, and academics that have documented wind energy's role in reducing electricity prices.[30] For example, an analysis in Massachusetts found that the state's renewable initiatives have annual net benefits of $219 million.[31] A recent analysis in PJM found that doubling the use of wind energy beyond existing RES requirements would produce net savings for consumers of $6.9 billion per year.[32]

Several analyses by Charles River Associates ("CRA"), International have quantified the value of transmission and wind. One study looked at an investment in a high-voltage transmission overlay to access wind resources in Kansas, Oklahoma, and Texas. It concluded the transmission investment would provide economic benefits of around $2 billion per year for the region, more than four times the $400-500 million annual cost of the transmission investment.[33] Nine hundred million dollars of these benefits would be in the form of direct consumer savings on their electric bills, with $100 million of these savings coming from the significantly higher efficiency of high-voltage transmission,

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[29] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 15, *citing* PÖyry, Wind Energy and Electricity Prices, at pages 11 and 12.

[30] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 15, *citing* http://awea.files.cms-plus.com/AWEA%20White%20Paper-Consumer%20Benefits%20final.pdf, at page 4.

[31] Id., at 15, *citing* Recent Electricity Market Reforms in Massachusetts: A Report of Benefits and Costs (July 2011), *available at* http://www.mass.gov/eea/docs/doer/publications/electricity-report-jul12-2011.pdf.

[32] Id., *citing* Synapse Energy Economics, The Net Benefits of Increased Wind Power in PJM, (May 2013), *available at* http://cleanenergytransmission.org/uploads/EFC%20PJM%20Final%20Report%20May%209%202013.pdf.

[33] Id., at 15-16, *citing* CRA International, First Two Loops of SPP EHV Overlay Transmission Expansion: Analysis of Benefits and Costs (September 26, 2008) *available at* http://www.crai.com/uploadedFiles/RELATING_MATERIALS/Publications/BC/Energy_and_Environment/files/Southwest%20Power%20Pool%20Extra-High-Voltage%20Transmission%20Study.pdf.

which would reduce electricity losses by 1,600 gigawatt-hours ("GWh") each year. The remainder would stem from reduced congestion on the grid allowing customers to obtain access to cheaper power.

Similarly, CRA's analysis of the proposed Green Power Express, which would connect 17 gigawatts ("GW") of wind to the grid in the MISO region, found that the transmission plan would yield benefits of $4.4 to $6.5 billion per year for the region (in 2008 dollars), well above the annualized cost of the transmission, estimated to be between $1.2 billion and $1.44 billion.[34]

In addition, a May 2012 report by Synapse Energy Economics found that adding 20 to 40 GW of wind energy and the accompanying transmission in the MISO region would reduce the cost of the wholesale electricity needed to serve a typical home by between $63 and $200 per year.[35] As illustrated in schedule MG-9 to CEI witness Goggin's direct testimony, this report found that electricity market prices decrease drastically as more wind capacity is added to the MISO system. As the report explains, "Since wind energy 'fuel' is free, once built, wind power plants displace fossil-fueled generation and lower the price of marginal supply—thus lowering the energy market clearing price."[36]

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[34] Id., at 16, *citing* FERC Docket ER09-1431, Protest of NextEra Energy Resources, LLC, Iberdrola Renewables, Inc., Mesa Power Group, LLC, Horizon Wind Energy LLC, Enxco, Inc., Acciona Wind Energy USA LLC, GE Energy, Vestas Americas and the National Resources Defense Council. Affidavit of Robert Stoddard, page 4, *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12111601.

[35] Id., at 17, *citing* Synapse Energy Economics, Inc., The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region, at page 3 (May 22, 2012) *available at* http://cleanenergytransmission.org/wp-content/uploads/2012/05/Full-Report-The-Potential-Rate-Effects-of-Wind-Energy-and-Transmission-in-the-Midwest-ISO-Region.pdf.

[36] Id.

Utilities have also publically commented on the consumer benefits of wind energy. American Electric Power subsidiary Southwestern Electric Power Co. ("SWEPCO") signed long-term power purchase agreements for a total of 358.65 MW from wind projects in Texas, Oklahoma and Kansas. SWEPCO said in a news release that it estimated an average decrease in cost to its customers of about 0.1 cents per kilowatt-hour over a 10-year period starting in 2013.[37] As another example, Oklahoma Gas and Electric estimates that a single wind project will save Arkansas customers $46 million.[38] A final example is Alabama Power, a subsidiary of Southern Company. It made several recent wind power purchases and John Kelley, Director of Forecasting and Resource Planning, explained that "These agreements are good for our customers for one very basic reason, and that is, they save our customers money."[39]

(2) GBE Interconnect in Missouri can Lower Renewable Energy Costs for Missouri

The GBE Project is designed to deliver approximately 500 MW of low-cost wind generation from Kansas into Missouri. The increase in renewable energy supply due to GBE will tend to lower the price of renewable energy or RECs that vie for utility purchases of renewable energy.

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[37] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 17-18, *citing* AEP Southwestern Electric Power Company, AEP SWEPCO Signs Wind Power Purchase Agreements for 359 Megawatts, (1/25/2012), *available at* https://www.swepco.com/info/news/ViewRelease.aspx?releaseID=1183

[38] Id., at 17-18, *citing* Direct Testimony of Gregory W. Tillman before the Arkansas Public Service Commission, (August 2012), *available at* http://www.apscservices.info/pdf/12/12-067-u_2_1.pdf.

[39] Id., at 18 *citing* Alabama Power, Alabama Power among leaders in SE in wind power, (October 2012), *available at* http://www.youtube.com/watch?v=6q6Q0_C1SX0 at 2:25.

Increasing a utility's access to low-cost renewable energy or RECs -- as the GBE Project should do -- keeps the utility's cost of compliance low, which helps them meet their renewable energy target at the lowest market cost possible at that time. Thus, the low-cost renewable energy and RECs that the GBE Project provides to Missouri improve the cost-effectiveness of the competitive renewable electricity market.

(3) GBE and Wind Energy can Lower Renewable Energy Costs for Missouri

Basic economic principles dictate that adding additional supply of renewable energy will reduce prices for renewable energy credits by providing Missouri utilities with more options for compliance. Wind energy delivered via the GBE Project will be eligible for compliance with RES requirements in most MISO and PJM states. With the notable exceptions of Ohio, Michigan, and Illinois, most PJM and MISO state RESs allow renewable energy delivered to each ISO's footprint to qualify for compliance. Missouri utilities are competing with all of these utilities for low-cost renewable energy and RECs. As a result, wind energy delivered via the GBE Project to the converter station in Missouri can be sold in Missouri, Illinois and Wisconsin, while the converter station in Sullivan, Indiana will be connected to the PJM market. As a result, this renewable energy could be used by utilities in PJM and MISO for compliance with their renewable energy standards. Because renewable energy can be delivered across the seam between MISO and PJM, with or without the GBE Project in place, REC prices in PJM can affect REC prices in MISO. The additional wind energy delivered by this project would tend to reduce the price of RECs across both the MISO and PJM markets. While the Missouri RPS does not limit Missouri utilities to purchasing renewable energy from these markets, lowering REC prices in those regions will provide Missouri utilities with more low-cost options for

REC purchases. The additional supply of RECs will be particularly important under a case in which EPA's Clean Power Plan drastically increases the nationwide demand for RECs. The savings from lower cost RECs would be passed on directly to Missouri consumers and consumers of those utilities that purchase renewable energy from the GBE Project.

GBE witness Berry estimated the energy cost plus transmission fee for wind energy delivered by the GBE project would be in the range of 3.5 to 4.5 cents per kWh[40], which is below the average cost of PPAs signed in the receiving region. In his surrebuttal testimony, GBE witness Berry provides an updated delivered cost of wind energy. The new cost range is 3.6 to 4.6 cents per kWh, which is not substantively higher than what he presented in his direct testimony.[41] The new range of delivered wind energy cost is still below the average cost of wind power purchase agreements of 5.7 cents per kWh that were signed in the Northeast region and 5.3 cents per kWh that were signed in the Great Lakes region in 2013.[42]

(4) GBE and Wind Provide Environmental Benefits

An increased amount of wind energy production can save water and reduce emissions of SO2, NOx and CO2.

Wind energy requires virtually zero water to produce electricity, while most conventional forms of electricity generation consume hundreds of gallons of water per

[40] Exh. 118, Direct Testimony of David Berry on Behalf of Grain Belt Express Clean Line LLC, at 17:12-18 (March 26, 2014).

[41] Exh. 120, Surrebuttal Testimony of David Berry on Behalf of Grain Belt Express Clean Line LLC, at 19-20 (October 14, 2014).

[42] Exh.700, Direct Testimony of CEI Witness Michael Goggin at 9 and 28-29.

MWh produced. The US Department of Energy has found that producing 20% of America's electricity from wind energy would conserve 4 trillion gallons of water cumulatively through the year 2030.[43] GBE witness Cleveland's analysis indicates that the wind enabled by the GBE Project would reduce water consumption across the eastern U.S. by 4.2 billion gallons in 2019.[44] Given that wind delivered via the converter station in Missouri will displace fossil generation in MISO, and that analysis using EPA's AVoided Emissions and geneRation Tool (AVERT) tool[45] indicates Missouri has a large share of the region's marginal fossil generators that would have their output reduced by introducing new wind generation into MISO, it is likely that Missouri will receive a significant share of these total benefits. These water savings would be particularly valuable in an agricultural state like Missouri.

GBE witness Cleveland found that the GBE Project would reduce SO_2 emissions by 19,788 tons in 2019, annual NO_x emissions by 7,111 tons in 2019, and annual CO_2 emissions by 10,013,130 tons in 2019.[46] These results are consistent with results CEI witness Goggin reaches using EPA's AVoided Emissions and geneRation Tool (AVERT).[47] AVERT uses empirical power system data and a statistical algorithm to identify which of a region's power plants will have their output displaced by the addition

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[43] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 24, *citing* U.S. Dep't of Energy, 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply at 16 (Executive Summary) (2008), *available at* http://www.20percentwind.org/ .

[44] Exh. 116, Direct Testimony of Gary Moland on Behalf of Grain Belt Express Clean Line LLC, at sched. M-2, sht 3 of 3.

[45] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 25, *citing* AVERT *available at* http://epa.gov/statelocalclimate/resources/avert/index.html

[46] Exh. 116, Direct Testimony of GBE Witness Gary Moland at 11:17-19 and sched. M-2 at sht 3 of 3.

[47] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 25, *citing* AVERT *available at* http://epa.gov/statelocalclimate/resources/avert/index.html.

of wind energy. CEI witness Goggin found that the average emissions reduction for each MWh of wind energy produced in or physically delivered to AVERT's Lower Midwest region, which includes most of SPP, to be 2.33 lbs of SO_2/MWh of wind, 1.65 lbs of NOx/MWh, and 1,675 lbs of CO_2/MWh. An average MWh of wind produced in or physically delivered to AVERT's Great Lakes/MidAtlantic region, which is roughly consistent with the PJM region, yields savings of 3.70 lbs of SO_2/MWh, 1.36 lbs of NOx/MWh, and 1,545 lbs/MWh of CO_2.

C. Economic Feasibility

There is a lack of transmission infrastructure in Missouri and in the central Midwest to efficiently deliver wind energy from the Plains states to demand centers in MISO and PJM. The Plains states have some of the best wind resources in the country, and the lack of new transmission is inhibiting the economic opportunities of wind generators. The GBE Project would provide an economically feasible opportunity to bring wind generation to states with high electricity demand in PJM and MISO, including Missouri.

No transmission projects have been built between SPP and MISO since SPP was created in 2004[48], and as of July of this year there were no other transmission service requests between SPP and MISO.[49] MISO and SPP currently have a case[50] before the

[48] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 27, *citing* International Transmission Co., Comments of International Transmission Company d/b/a ITC Transmission, Michigan Electric Company, LLC, ITC Midwest LLC and ITC Great Plans, LLC, at 2-3 (July 1, 2014), *filed in* Missouri PSC Docket EW-2014-0156.

[49] Id., at 27, *citing* Southwest Power Pool, Inc.'s Comments in Response to The Commission's Questions Identified in Its Order Opening an Investigation into Seams, at 15 (July 1, 2014) *filed in* Missouri PSC Docket EW-2014-0156.

[50] Id., at 27, *citing* Midcontinent Independent System Operator, Inc.'s Compliance Filing for Order No. 1000, Regarding Interregional Transmission Project Coordination and Cost Allocation with Southwest Power Pool, Inc., FERC Docket No. ER13-1938-000 (Jul. 10, 2013); Compliance Filing of Southwest Power Pool, Inc., at 21, FERC Docket No. ER13-1937-000 (Jul. 10, 2013).

Federal Energy Regulatory Commission to revise their inter-regional transmission planning and cost allocation process. SPP's transmission planning policies are currently structured entirely around planning transmission to meet SPP demand, with no consideration for planning lines to meet export demand. That policy would have to change before SPP would likely even begin planning a transmission line to serve demand outside the SPP footprint, which means it is extremely unlikely any line of that type would enter service this decade.[51]

Currently, there is no outlet for Kansas wind energy. Transmission is essential if the wind energy resources in Kansas and the Plains states are to be fully utilized in meeting the renewable energy needs of the U.S. The western Kansas area and the plains states in general possess wind resources that are many times greater than their electricity demand, so transmission is needed to move the energy from these wind energy resources to load centers elsewhere.[52] Kansas is on the western edge of the Eastern Interconnection, making export west exceedingly unlikely. Opportunities to move Kansas renewable energy eastward to load centers over existing transmission are virtually non-existent due to widespread congestion. Areas north and south of Kansas also have very large wind energy resources and relatively low electricity demand, so delivering the wind energy from Kansas to those states is not a viable solution. Given the large electricity demand in Missouri, MISO and PJM, building a long-distance, HVDC line to deliver wind energy resources in western Kansas to consumers in those states is an ideal solution.

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[51] Exh.700, Direct Testimony of CEI Witness Michael Goggin at 27.
[52] Id., sched. MG-3.

Moreover, Kansas has some of the best prices for wind energy due to its' high wind capacity factors.[53] Capacity factor significantly affects the economics of wind generation. As indicated in CEI witness Goggin's schedule MG-7, wind Power Purchase Agreements ("PPAs") prices in the Interior region have averaged around $27 per megawatt-hour ("MWh") over the last three years, versus a figure of $53/MWh for the Great Lakes region and $57/MWh for the Northeast. Based on the smaller subset of wind project PPAs signed in 2013, the Interior region had average PPA prices of $22/MWh. While differences in land and construction costs are a partial factor, the higher capacity factors in the Interior region are almost certainly the major factor for the difference in PPA price between the Interior and these other regions.[54]

The GBE Project would provide an economically feasible opportunity to bring wind generation to states in PJM and MISO, including Missouri, because the delivered cost of wind energy using the GBE is less expensive than Missouri wind and less than the cost of wind purchased through power purchase agreements in the PJM area. As previously discussed in section III.B(3), *supra*, GBE witness Berry estimated the energy cost plus transmission fee for wind energy delivered by the GBE project would be in the range of 3.6 to 4.6 cents per kWh[55], which is below the average cost of wind PPAs signed in the Great Lakes and Northeast region in 2013.[56]

IV. CONCLUSION AND REQUESTED RELIEF

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[53] Id. at 7-9.
[54] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 9.
[55] Exh. 118, Direct Testimony of GBE Witness David Berry, at 17:12-18.
[56] Exh.700, Direct Testimony of CEI Witness Michael Goggin, at 28-29 and 9.

Wherefore, Clean Energy Intervenors respectfully requests that the Commission find that the Grain Belt Express Project [1] is needed, [2] is in the public interest, [3] is economically feasible, and therefore will grant Grain Belt Express a certificate of convenience and necessity to construct, own, control, manage, operate and maintain a high voltage, direct current transmission line in Missouri and an associated converter station providing an interconnection on the Maywood 345 kV transmission line.

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