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CROSS-SURREBUTTAL TESTIMONY

OF

MICHAEL GOGGIN

SUBMITTED ON BEHALF OF:

WIND ON THE WIRES and THE WIND COALITION

FEBRUARY 21, 2017

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INTRODUCTION

Q: Please state your name, job title, and business address.

A: My name is Michael Goggin, and I am the Senior Director of Research for the American Wind Energy Association ("AWEA"). My business address is 1501 M St NW, Suite 1000, Washington DC, 20005.

Q: For whom are you testifying?

A: I am testifying on behalf of Wind on the Wires and The Wind Coalition.

Q: Are you the same Michael Goggin who previously testified in this proceeding on behalf of Wind on the Wires and The Wind Coalition?

A: Yes.

Q: What is the purpose of your testimony?

A: The purpose of my cross rebuttal testimony is to respond to the rebuttal testimony of Show-Me Concerned Land Owners' witnesses Donald Shaw, to Missouri Landowners Alliance witnesses Joseph Jaskulski, and Paul Glenden Justis, Jr., and to Missouri Public Service Commission Staff. I respond to Mr. Shaw's comments regarding the need to regulate CO_2 emissions (Shaw Rebuttal Testimony at page 6), to Mr. Justis' capital costs for wind energy (Justis Rebuttal, Sched. PGJ-01 HC) and the production tax credit wind resources qualify for under IRS guidance, to three of Mr. Jaskulski's statements regarding the need for a memorandum of understanding with wind farm owners and the Continuity Safe Harbor provision and the ability for Kansas wind projects (Jaskulski Rebuttal Testimony at 4 and 14). I also respond to Staff's concern about

congestion in the event Ameren Transmission Company of Illinois' Mark Twain project, Ameren Missouri's use of RECs for compliance with the Missouri Renewable Energy Standard and comments about emissions from additional ancillary services needed to integrate additional wind resources carried by the Grain Belt Express line. (Staff Rebuttal Report at 6-7, 17 and 38).

RESPONSE TO SHOW ME CONCERNED LANDOWNERS' WITNESS SHAW

Q: Show Me Concerned Landowners' witness Shaw testified that there is no link between CO_2 and global warming and if there is the Grain Belt Express project would have a miniscule impact on the global reduction of CO_2. (Shaw RTTY at page 6, lines 17-19). **Do you have a response to that?**

A: There is no legitimate dispute of the observable facts that CO_2 is a greenhouse gas that warms the earth, and that atmospheric concentrations of CO_2 are increasing due to human activity, particularly the combustion of fossil fuels. The overwhelming consensus of scientists is that man-made CO_2 emissions are causing dangerous climate change,[1] and the misconceptions put forward by Mr. Shaw have been thoroughly debunked by the scientific literature.[2] Businesses realize that

[1] Summary for Policymakers, "Climate Change 2013: The Physical Science Basis Contribution of Working Group I to the Fifth Assessment of the Intergovernmental Panel on Climate Change" (2013) available at https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf

[2] Scientific American, "No Pause in Ocean Warming" (Jan. 4, 2017) available at https://www.scientificamerican.com/article/no-pause-in-ocean-warming/

requirements to reduce CO_2 emissions are inevitable, and that in many cases climate change negatively affects their bottom line. In an effort to gain competitive advantage by leading the field in making inevitable cuts to CO_2 emissions, many electric utilities and other companies are continuing to move to cleaner forms of electricity generation. In addition to the quotes from large utilities I cited in my Rebuttal Testimony, half of the Fortune 500 companies have greenhouse gas reduction plans in place.[3] More than 745 companies and financial investors who in combination employ more than 1.8 million Americans signed a letter to President Trump encouraging him to continue supporting the Paris Agreement to reduce CO_2 levels so as to prevent global temperature rise of 2 degrees Celsius by the end of the century.[4] It is not one company or one action that reduces CO_2 emissions, it is a vast number of small actions. Grain Belt Express is just one of those efforts. It will enable 4,000 megawatts of wind generation to operate. Wind turbines do not create electricity through combustion thus it does not emit CO_2. A wind turbine's electricity displaces electricity that would have be generated by a coal or natural gas electric generating plant, so the overall CO_2 emissions rate is reduced. Thus, Mr. Jaskulski's comparison of the CO_2 emission reduction benefits of the Grain Belt Express line to the global CO_2 emission levels is a poor

[3] Los Angeles Times, "Trump's vow to scrap the Paris climate change accord faces skepticism from corporations and GOP moderates" (Feb. 15, 2017) available at http://www.latimes.com/politics/la-na-pol-trump-paris-accord-20170215-story.html

[4] *Id.*; see also "Investors with $2.8 trillion in assets unite against Donald Trump's climate change denial" available at http://www.independent.co.uk/news/business/news/investors-billionaires-trillion-assets-unite-donald-trump-climate-change-denial-global-warming-a7581161.html

yardstick by which to measure the Project's benefits. It is beneficial and it is one of many similar actions needed to help control man-made CO_2 emissions. For Missouri utilities and ratepayers, taking steps to reduce CO_2 emissions now, such as approving the Grain Belt Express project, will greatly minimize costs associated with reducing CO_2 emissions in the future.

RESPONSE TO SHOW ME CONCERNED LANDOWNERS' WITNESS JUSTIS Jr.

Q: Show Me witness Justis prepared a levelized cost of energy for Kansas Wind that uses a wind energy capital cost of **[redacted]. (Justis Sched. PGJ-01 HC). Do you have a response to that?**

A: First, his starting value is too high. Mr. Justis claims his **[redacted]** figure comes from the regional results of a U.S. Energy Information Administration (EIA) document, but he appears to have mis-interpreted that document as both the national and regional results included in that report are significantly lower than what he cites. Specifically, the actual national average overnight capital cost in that document is $1,686/kW, while the regional cost for wind projects in SPP is lower at $1,536/kW.[5] Other reports based on empirical data confirm that his number is too high, with DOE/LBNL data indicating an average cost of around $1,637/kW

[5] U.S. EIA, "Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2017" (Jan. 2017) available at http://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf, pages 2 and 3

HC

($2015), based on data for wind projects installed in 2015 in the Interior region of the U.S., which includes Kansas.[6]

A second error is his escalation rate. The current trend of wind costs is strongly downward, decreasing by 66% over the last 7 years.7 National Renewable Energy Laboratory results indicate this trend is expected to continue, with early 2020 costs for the wind resource categories associated with Kansas expected to fall by more than $100/kW in the mid-cost projection, and by more than $300/kW in the low-cost scenario. In no scenario does the real cost of wind increase.

Q: Mr. Justis claims the in-service date for the wind associated with the Grain Belt Express project is likely to be 2022 rather than 2021, and therefore qualifying for a 60% production tax credit instead of 80%, because of his claim that there are likely to be delays in the project. Does Internal Revenue Service (IRS) guidance provide for such delays in interconnecting wind projects?

A. Yes. In its 2016 guidance, the IRS provides a list of "excusable disruptions" that allow a wind project to still qualify for the higher level of PTC if its completion were impaired by factors beyond its control, and that list includes "interconnection-related delays, such as those relating to the completion of construction on a new transmission line or necessary transmission upgrades to resolve grid congestion issues that may be

[6] U.S. Dept. of Energy and Lawrence Berkeley National Laboratory, "2015 Wind Technologies Market Report", Figure 43, available at https://emp.lbl.gov/publications/2015-wind-technologies-market-report

[7] Lazard, "Lazard's Levelized Cost of Energy Analysis -- version 10.0" (Dec. 2016) available at https://www.lazard.com/media/438038/levelized-cost-of-energy-v100.pdf, slide 10

associated with a project's planned interconnection."[8] Alternatively, a wind project can be placed into service prior to 2022, even if the Grain Belt Express line is not yet in service. In doing so the wind project would still qualify for the production tax credits under the safe harbor provision.

RESPONSE TO MLA WITNESS JASKULSKI

Q: In MLA witness Jaskulski's testimony he expresses concern that Grain Belt Express does not have memoranda of understanding with wind generators. (Jaskulski RTTY at 4 lines 54-58). What are your thoughts about that?

A: I do not share his concern. It is becoming more common for transmission development to precede the development of wind resources. Transmission planners or transmission developers have pro-actively planned transmission to high wind resource areas before wind projects have been built as a way of tapping into the potential of that market.[9] We have seen this work in ERCOT, SPP, and MISO. This was done with the Competitive Renewable Energy Zone lines in Texas,[10] the Priority Projects in SPP,[11] and the Regional Generator Outlet Study in MISO,[12] which

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[8] IRS, Notice 2016-31, available at https://www.irs.gov/pub/irs-drop/n-16-31.pdf, page 7

[9] *See generally*, FERC, Order 1000, at ¶¶ 2, 3, 6, 29, 38, 45, *available at* http://www.ferc.gov/whats-new/comm-meet/2011/072111/E-6.pdf.

[10] Electric Reliability Council of Texas ("ERCOT"), Competitive Renewable Energy Zones (CREZ) Transmission Optimization Study, (April 2008), attachment as part of ERCOT filing with the Public Utilities Commission of Texas, *available at* http://pbadupws.nrc.gov/docs/ML0914/ML091420467.pdf.

[11] SPP, "Priority Projects," https://www.spp.org/engineering/transmission-planning/priority-projects/

[12] MISO, Regional Generation Outlet Study, *available at* https://www.midwestiso.org/Planning/Pages/RegionalGenerationOutletStudy.aspx.

developed the plan for the Multi-Value Projects that were approved by MISO. After the CREZ lines were announced, ERCOT has seen around 9 GW of wind farms built, with another 11 GW having signed Interconnection Agreements, most in areas served by the CREZ lines.[13] Similarly, since the Multi-Value Project lines were approved in 2011, 13.7 GW of wind resources have been sited and built in areas proximate to those lines, and MISO projects that another 10.6 GW is yet to be built. This is consistent with the fact that there is a mismatch in development times between transmission and wind farms. A wind farm can be planned and built in a few years or less, whereas the time from planning to in-service date of a transmission line is typically longer than three years.

Q: Mr. Jaskulski states that if the Grain Belt Express lines does not enter service until 2022, that the wind farms using the line will not qualify for the Continuity Safe Harbor provision and will lose their eligibility for the federal production tax credit. (Jaskulski RTTY at 14 lines 269-272). **Do you share his concern?**

A: As explained above, I do not. As Mr. Jaskulski acknowledges, in 2016 guidance the IRS provides a list of "excusable disruptions" that allow a wind project to still qualify for the higher level of PTC if its completion were impaired by factors beyond its control, and that list includes "interconnection-related delays, such as those relating to the completion of

[13] Electric Reliability Council of Texas (ERCOT), "ERCOT Monthly Operational Overview" (Jan. 15, 2017) available at http://www.ercot.com/content/wcm/key_documents_lists/27311/ERCOT_Monthly_Operational_Overview_2016-12.pdf

construction on a new transmission line or necessary transmission upgrades to resolve grid congestion issues that may be associated with a project's planned interconnection."[14] Alternatively, a wind project can be placed into service prior to 2022, even if the Grain Belt Express line is not yet in service. In doing so the wind project would still qualify for the production tax credits under the safe harbor provision.

RESPONSE TO MISSOURI PSC STAFF

Q: In its Rebuttal Report (at pages 6-7) Staff notes that the Commission's approval of the ATXI Mark Twain is the subject of appeal and raises questions about what would happen to the Grain Belt Express if the Mark Twain line does "not proceed as planned."

A: The Mark Twain line is one of seventeen transmission projects approved by MISO in 2011 that provided multiple benefits to the system -- such as improving the reliability of the system and lowering the cost of the production of electricity. MISO's function is to perform transmission planning across the Midwest (parts of Missouri, Michigan, Indiana, Illinois, Kentucky, Arkansas, Louisiana, Mississippi, Texas, North Dakota and South Dakota, and all of Wisconsin Iowa and Minnesota) inclusive of Ameren Missouri. All planning that MISO has performed since the Mark Twain was approved assumes that the Mark Twain line will be built. In the event the Mark Twain is not built MISO will simply make that change, and re-evaluate the system and propose transmission additions to solve any

[14] IRS, Notice 2016-31, available at https://www.irs.gov/pub/irs-drop/n-16-31.pdf, page 7

problems arising from its absence. That is a routine transmission planning function that should not be viewed as a major impediment of the Grain Belt Express.

Q: Staff points out that Ameren Missouri does not "need" to purchase renewable energy to meet its 2021 RES compliance requirement. (Staff Report at 17). **Do you have a response to that?**

A: Staff witness Beck is correct that utilities are allowed to purchase RECs for compliance, however, it is possible that Missouri utilities will only be alllowed to use RECs for compliance if it is related to energy that is used in Missouri. On page 12 of my rebuttal testimony I explain that the Missouri Supreme Court is entertaining a case (State of Missouri ex rel. Missouri Coalition for the Environment v. Joint Committee on Administrative Rules, court docket no. SC95546) that would reinsert language into the RES rule (4 CSR 240-20.100(2)(B)(2))) allowing a REC to be used for compliance with the RES only if the REC is tied to energy that was sold to Missouri customers. In addition, the energy provided by the Grain Belt Express would be at the low end of energy rates Ameren Missouri charges its customers, when I compare it to the following Summer and Winter Rates for the following customer classes:

	Winter Rates (¢ per kWh)	Summer Rates (¢ per kWh)
Large Primary Service	3.02	3.41
Small Primary Service	3.66 to 6.30	5.05 to 10.00
Large General Service	3.80 to 6.51	5.23 to 10.34
Small General Service	4.65 to 8.06	10.81
Residential Service	5.73 to 8.58	12.08

Thus renewable energy delivered into Ameren Missouri via the Grain Belt Express is multi-beneficial in that it allows for compliance with the RES, provides low cost energy (relative to current electric rates) and provides a hedge against fuel price volatility since most renewable energy is purchased through a 10 or 20 year contract.

Q: Staff states that Grain Belt Express's production modeling "does not account for any increase in emissions that will result from the ancillary service activities such as regulating reserves necessary to integrate any increase in wind generation." (Staff Report at 38). **Do you have a response to that?**

A: The misconception that wind generation variability and uncertainty has a significant impact on emissions has been thoroughly debunked. NREL analysis has shown that even at penetrations of wind and solar energy in excess of 33%, the variability and uncertainty of these resources has a "negligible" (0.3%) impact on emissions, meaning wind and solar provide 99.7% of the expected emissions reductions.[15] I have conducted analysis of ERCOT data, which shows that wind has a minimal impact on total reserve needs, particularly regulation reserves, in ERCOT.[16]

Q: Does this conclude your testimony?

A: Yes.

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[15] NREL, "The Western Wind and Solar Integration Study Phase 2" (Sept. 2013) available at http://www.nrel.gov/docs/fy13osti/55588.pdf

[16] AWEA's Into the Wind blog, "Fact Check: Wind's integration costs are lower than those for other energy sources," (July 2014) available at http://www.aweablog.org/fact-check-winds-integration-costs-are-lower-than-those-for-other-energy-sources/