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Witness: David Loomis
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Clean Line LLC
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2014-0207

DIRECT TESTIMONY OF

DR. DAVID G. LOOMIS

ON BEHALF OF

GRAIN BELT EXPRESS CLEAN LINE LLC

March 26, 2014

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I. INTRODUCTION

Q. Please state your name, present position and business address.

A. My name is David G. Loomis. I am Principal of Strategic Economic Research, LLC, Professor of Economics at Illinois State University, Director of the Center for Renewable Energy, and Executive Director of the Institute for Regulatory Policy Studies. My business address is 2705 Kolby Court, Bloomington, IL 61704.

Q. Please describe your education and professional background.

A. I received a Bachelor of Arts degree in economics and mathematics and a Doctor of Philosophy degree in economics from Temple University. I achieved the rank of full Professor at Illinois State University in 2010. I am a member of the Steering Committee and Chair of the Transmission and Economic Development Workgroup at the Great Lakes Wind Collaborative.

As part of my duties as Professor of Economics at Illinois State University, I teach and oversee the course sequence in Electricity, Natural Gas and Telecommunications Economics within the Applied Economics Master's Degree Program. I have been teaching classes that cover transmission markets, cost allocation and pricing for over 15 years, including Economics of Regulation and Antitrust, Economics of Energy, and Industry Studies in Electricity, Natural Gas and Telecommunications Economics. I was part of the team of three faculty members that created a unique undergraduate degree program in renewable energy at Illinois State University. I have authored or co-authored 25 publications in peer-reviewed publications such as *Energy Policy*, *Energy Economics*, *Electricity Journal*, and *Applied Energy.* I have also co-authored several reports on the economic impact of wind farms (*Economic*

Impact of Wind Energy Development in Illinois 2009, 2010, 2011; Illinois Wind Turbine Supply Chain Report 2010).

I have received numerous professional awards including the 2011 Midwestern Regional Wind Advocacy Award from the U.S. Department of Energy's Wind Powering America, the 2009 Economics Department Scott M. Elliott Faculty Excellence Award, the Illinois State University Million Dollar Club in 2009 (awarded to faculty who received over $1 million in grants), and the 2008 Outstanding State Wind Working Group Award. My full curriculum vitae is provided in **Schedule DGL-1** to this testimony.

Q. What is the purpose of your direct testimony?

A. I am testifying in support of the request of Grain Belt Express Clean Line LLC ("Grain Belt Express" or "Company") to be issued a certificate of convenience and necessity to construct, operate and maintain the Grain Belt Express Clean Line transmission project ("Grain Belt Express Project" or "Project") and to operate as a public utility in Missouri. I will address the economic impact of the proposed Project on the Missouri economy. My colleague Dr. J. Lon Carlson and I performed a study to estimate the economic impact of the project. The analysis shows that the Project itself will result in 1,315 Missouri jobs per year during three-year construction of the Project and 70 long term Missouri jobs during ongoing operations. In addition, the Project will enable an estimated 4,000 megawatts ("MW") of wind farms to be built that will result in an additional 1,311 to 3,933 Missouri jobs in manufacturing and associated industries. The full report of the study that we performed is provided in **Schedule DGL-2** to my testimony.

II. SUMMARY OF RESULTS OF ECONOMIC IMPACT STUDY

Q. What economic impacts of the Grain Belt Express Project did your study assess?

A. The study estimated the economic impacts of the Project in two parts: (1) the economic impact of the Project itself and (2) the economic impact of the wind farms that this Project will enable to be built. For both the Project and the new wind generation facilities, the study measured the economic impact of the construction itself, as well as the economic impact of their ongoing operations and maintenance ("O&M").

Q. What does the study estimate will be the economic impact of the construction of the Grain Belt Express Project?

A. The study estimates that the construction of the Project itself will—when considering the production of inputs to the line such as towers, wire, and real estate services—create a demand for approximately 1,315 construction jobs per year for three years in Missouri. Labor income will increase by $77.0 million per year in Missouri for three years. Overall output will increase by $206.0 million per year in Missouri for three years.

Q. What Missouri companies will be involved in the construction of the Grain Belt Express Project?

A. The Company has already signed agreements with three Missouri-based manufacturers to supply parts of the Project: ABB Inc. ("ABB"), General Cable Industries, Inc. ("General Cable"), and Hubbell Power Systems, Inc. ("Hubbell"). ABB Inc. is the Company's preferred supplier to manufacture alternating current transformers for the collector system. ABB plans to manufacture the transformers in its St. Louis facility. In addition, General Cable will manufacture the steel core for the transmission line conductor at its Sedalia facility. Finally, Hubbell is the preferred supplier of insulators and hardware for

the Project, and will manufacture the hardware and the core of the polymer insulators at its Centralia facility.

Q. What does the study estimate will be the economic impact of the ongoing operations and maintenance of the Grain Belt Express Project?

A. The study estimates that the economic impact of the annual O&M costs of the Project, which will be incurred when the line is placed into service and operating, will be 70 jobs and $4.1 million of labor income in Missouri annually. Overall output will increase by $9.2 million annually in Missouri.

Q. What does the study estimate will be the fiscal impacts of the Grain Belt Express Project?

A. The study estimated certain tax-related impacts of the projected increases in final demand in the four-state region. The tax impacts considered here include individual income tax, corporate income tax, and sales tax receipts. The study estimated that revenues from income taxes paid by individuals and by corporations in Missouri would total $4.19 million and $280,000, per year, respectively, over the three-year construction period. Sales tax revenues would yield an additional $6.75 million bringing the total tax revenue to $11.22 million over the three-year construction period.

As previously noted, once the transmission line is built and is in operation, O&M costs will contribute additional spending to the Missouri economy each year. Individual income tax, corporate income tax, and sales tax receipts resulting from O&M expenditures are predicted to yield approximately $189,000 per year in Missouri tax receipts.

Q. What does the study estimate will be the economic impact of the construction of the wind farms that the Grain Belt Express Project will enable to be built?

A. The Grain Belt Express Project is expected to stimulate the development of approximately 4,000 MW of wind farms in Kansas. In our study, the larger components of a wind turbine—the nacelle[1], tower, blades, and transportation—were examined in detail. Using information from the American Wind Energy Association's U.S. Wind Industry Annual Market Report 2012, we estimated that 55% of the nacelles, 90% of the blades, and 90% of the towers used to construct wind farms will be made in the United States. The Jobs and Economic Development ("JEDI") model of the U.S. Department of Energy's National Renewable Energy Laboratory ("NREL") was used to estimate the economic impacts of the wind farms. The JEDI model contains default values for how construction and O&M costs are allocated to the component parts of a wind generation facility. The default values in the JEDI model were used for the balance of plant components and for O&M costs.

As a result of the increase in development of wind generating facilities that will be stimulated and enabled by the Grain Belt Express Project, there will be economic benefits, including both direct expenditures to build wind farms and supply chain impacts due to increased demand. To estimate the state-level economic impacts of the new wind generation facilities, it was necessary to estimate the percentage of the wind turbine components that would be produced in each state. To define the range of benefits to Missouri and the other three states the Project traverses, we constructed two different scenarios. In the first scenario, this four-state region (Missouri, Kansas, Illinois and

[1] A nacelle is the part of a wind turbine that sits at the top of the tower and contains the gearbox and electric generating equipment.

Indiana) supplies 30% of the total domestic content of the wind turbines connected to the Project. In the second scenario, the same region supplies 90% of the domestic content of the turbines.

Q. What does the study estimate will be the economic impact in Missouri of the construction of the wind farms that the Project will enable to be built under the two scenarios?

A. While no wind farms are assumed to be built in Missouri as a direct result of the Grain Belt Express Project, the state will experience supply chain impacts attributable to the construction of wind farms in Kansas due to the Project. Based on my review of manufacturing firms located in Missouri, these firms supply many components used in the wind turbine supply chain. For example, Schaeffler Group USA Inc. in Joplin manufactures bearing arrangements for wind turbines; Able Manufacturing & Assembly, LLC in Joplin produces composite parts for wind turbine nacelles and blades; and ABB in Jefferson City manufactures transformers. Additional demand for wind turbines can therefore boost the employment and economic impact of existing Missouri firms, and possibly even lead to the addition of new manufacturing firms in the state. The employment impacts in Missouri during the construction phase are estimated to range from approximately 1,311 to 3,933 jobs, while earnings are estimated to amount to $79.8 million to $239.5 million under the 30% and 90% scenarios. The employment impacts include manufacturing jobs at companies in the wind turbine supply chain and other job types from the induced impacts in associated industries.

Q. In what year's dollars are the economic impacts calculated in the study stated?

A. All of the economic impact dollar values are stated in terms of 2013 dollars.

III. DESCRIPTION OF STUDY METHODOLOGY

Q. Please describe how the economic impact study was conducted.

A. The impacts of construction and operation of the transmission line were estimated using the IMPLAN model. The specific impacts that were analyzed include direct, indirect, and induced effects on employment, labor income, and output, as well as fiscal impacts—personal and corporate tax revenues—for the four-state region of Kansas, Missouri, Illinois and Indiana. In addition, as stated previously, the construction of the proposed transmission line is also expected to stimulate the construction of additional wind farms in Kansas. The impacts of construction and operation of these new wind farms were estimated using the JEDI model and include direct, indirect, and induced effects for each state in the four-state region.

Q. What is the IMPLAN model and how does it work?

A. IMPLAN is a micro-computer-based program that allows construction of regional input-output models for areas ranging in size from a single zip code region to the entire United States. The model allows aggregation of individual regions, such as counties, as well as databases for multi-region analysis. Stated briefly, the model is used to estimate the total impacts of an increase in spending in a particular industry. The economic impacts of the manufacturing of the required components, construction of the Project, and its operation and maintenance expenses were estimated using the IMPLAN model and 2011 data for Kansas, Missouri, Illinois and Indiana.

Total impacts are calculated as the sum of direct, indirect, and induced effects. Direct effects are production changes associated with the immediate effects of final demand changes, such as an increase in spending for the production of new structures that will be used to support the Project. Indirect effects are production changes in

backward-linked industries caused by the changing input needs of the directly affected industry, e.g., additional purchases to produce additional output such as the steel used in the construction of the new transmission structures. Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. An example of the induced effects is the increased spending of the incomes earned by newly hired steel workers.

The analysis summarized here focuses on the impacts of increased production of the different components of the Project, as well as the construction of the line, on employment, employee compensation, and total expenditures (output). Employment includes total wage and salary employees, as well as self-employed jobs in the region of interest. All of the employment figures reported here are full-time equivalents. Employee compensation represents income, including benefits, paid to workers by employers, as well as income earned by sole proprietors. Total output represents sales (including additions to inventory), which is a measure of the value of output produced. Impacts are estimated on a statewide basis for the four-state region, as well as for the United States as a whole.

Q. What is the JEDI model and how does it work?

A. The economic analysis of wind power development in the study utilized the JEDI Wind Energy Model (release number W1.10.03) of the U.S. Department of Energy's NREL. The JEDI Wind Energy Model is an input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output. For example, JEDI calculates how purchases of materials for construction of new wind generation facilities benefit not only

local turbine and turbine component manufacturers, but also the local industries that supply the concrete, rebar, and other materials needed to construct the facilities. Although the wind farms will be built in Kansas, Missouri is well-positioned to capture some of the manufacturing of wind turbine components with Missouri-based manufacturing companies such as Schaeffer Group, Able Manufacturing and ABB. The JEDI model uses construction cost data, operating cost data, and data relating to the percentage of goods and services acquired in the state to calculate jobs, earnings, and other economic activities that result from these activities. Economic activities would include contracts and business transactions that result in jobs being created and income being earned. The results are broken down into the construction period and the operation period of the wind generators. Within each period, impacts are further divided into direct, indirect, and induced impacts.

Direct impacts during the construction period refer to the changes that occur in the onsite construction industries in which a change in the direct final demand (i.e., spending on construction labor and services) is made. The initial spending on the construction and operation of the wind farm creates a second layer of "indirect" impacts. Indirect impacts during the construction period consist of the changes in inter-industry purchases resulting from the direct final demand changes, and include construction spending on materials and wind farm equipment, as well as other purchases of goods and offsite services. For example, concrete that is used in turbine foundations increases the demand for gravel, sand, and cement. Construction of the wind farm also increases demand for products of the manufacturers of turbine parts and components such as bearing producers, steel producers, and gear producers.

Indirect impacts during the operating years refer to the changes in inter-industry purchases resulting from the direct final demand changes. All land lease payments and property taxes are included in the operating-years portion of the results because these payments do not support the day-to-day O&M of the wind farm but instead are more of a latent effect that results from the wind farm being present.

Induced impacts during construction refer to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes. Induced impacts during the operating years of the wind generation facilities refer to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects from final demand changes.

Q. Where did you obtain your data inputs?

A. The estimates of the construction costs and the O&M costs of the Grain Belt Express Project and the breakdown of those costs by category were supplied by Grain Belt Express. Similarly, the estimates of the number of the wind farms that are projected to be constructed in Kansas as a result of the Grain Belt Express Project and the associated numbers of wind turbines and their capacities were supplied by Grain Belt Express. I reviewed the estimates that were provided and found that they were reasonable and in line with industry norms based on my experience with the wind turbine and electric transmission industries. The portions of the component equipment, parts and materials for the Project and the new wind generation facilities that are projected to be manufactured or produced in the United States were based on the JEDI model, industry reports and my knowledge of the wind industry.

Because it is difficult to know which companies will build components for the proposed wind farms until they are actually built, we estimated the economic impacts using two different scenarios. Given the overall domestic content from the national model, we assumed that the four-state region obtains either 30% or 90% of the total domestic content. In the case of structures, Missouri does not currently have any wind turbine tower manufacturers. Therefore, we shifted the Missouri wind turbine structure component supply to the other states.

Q. Please summarize the main conclusions of your testimony.

A. Based on the IMPLAN model, my analysis shows that the Project itself will result in 1,315 Missouri jobs per year during three-year construction of the Project and 70 long-term Missouri jobs during ongoing operations. In addition, the Project will enable 4,000 MW of wind farms to be built that will result in an additional 1,311 to 3,933 Missouri jobs in manufacturing and associated industries based on the JEDI model.

Q. Does this conclude your prepared direct testimony?

A. Yes, it does.

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

AFFIDAVIT OF DAVID G. LOOMIS

STATE OF ILLINOIS_____)
) ss
COUNTY OF MCLEAN_____)

David G. Loomis, being first duly sworn on his oath, states:

1. My name is David G. Loomis. I am Principal of Strategic Economic Research, LLC, a Professor of Economics at Illinois State University, Director of the Center for Renewable Energy, and Executive Director of the Institute for Regulatory Policy Studies.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Grain Belt Express Clean Line, LLC consisting of 11 pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

David G. Loomis

Subscribed and sworn before me this 20th day of March, 2014.

Notary Public

My commission expires: 04-09-2017

"OFFICIAL SEAL"
CONNIE J. CARSTENS
Notary Public, State of Illinois
My Commission Expires 04-09-2017