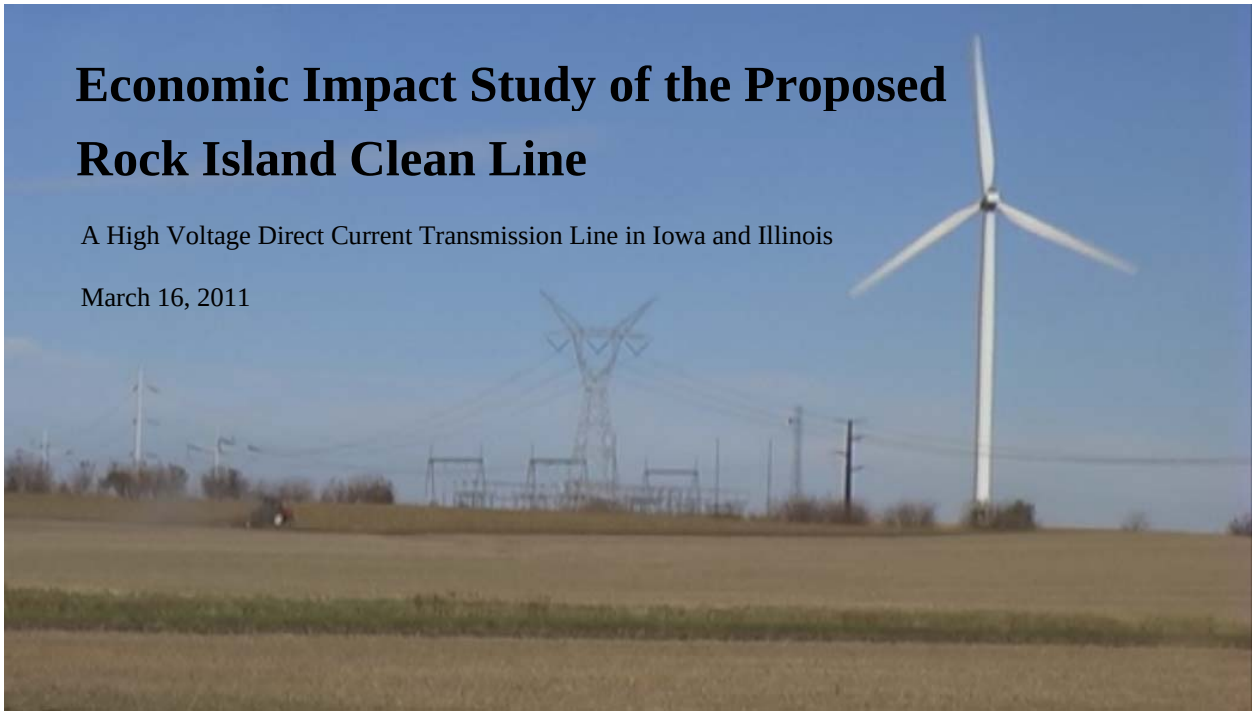

Economic Impact Study of the Proposed Rock Island Clean Line

A High Voltage Direct Current Transmission Line in Iowa and Illinois

March 16, 2011

Prepared For: Rock Island Clean Line LLC

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Executive Summary

Rock Island Clean Line LLC ("Clean Line") is proposing to build the Rock Island Clean Line, a 500-mile, high voltage direct current transmission line that will connect the wind resources in the tri-state region of Iowa, Nebraska, and South Dakota with energy demand centers in Illinois and points farther east. The construction of the proposed transmission line is expected to stimulate the construction of approximately 4,000 MW of additional wind farms in the tri-state region.

This report estimates that the construction of the Rock Island Clean Line itself will—when considering the production of inputs to the line such as towers, wire, and real estate services—create a demand for approximately 2,700 construction jobs per year for three years in Iowa and approximately 1,450 construction jobs per year for three years in Illinois, as well as an estimated 143 permanent operations and maintenance jobs in Iowa and 80 such jobs in Illinois. Furthermore, in regard to the production of the components for the wind farms that would serve the line, the report estimates that the Rock Island Clean Line would support thousands of manufacturing supply chain jobs in both states and would result in the creation of about 400 permanent operations and maintenance jobs at those associated wind farms in Iowa. Finally, the report summarizes tax and other investment benefits the construction and operation of the transmission line and the related wind farms would enable.[1]

Economic Impacts of Construction of the Rock Island Clean Line

Table ES-1: Estimated Annual[1] Impacts[2] of Construction of the Rock Island Clean Line in Iowa and Illinois

	Iowa	*Illinois*
Impact	*Annual Average*	*Annual Average*
Change in Final Demand	$259.2	$132.5
Employment	2,718	1,451
Labor Income	$120.0	$86.8
Output	$394.2	$256.3

[1] Construction period = 3 years
[2] All monetary impacts in millions of 2010 $

Construction

As seen in Table ES-1, when assuming all production and construction-related activities for the transmission line are completed by in-state firms in Iowa and Illinois, the potential total employment impact over the projected period would amount to approximately 4,170 jobs per year for three years. Projected income impacts are substantial as well; the total labor income impact over the projected period would amount to approximately $207 million per year for three years.

[1] The impacts of construction and operation of the transmission line, fiscal impacts—personal and corporate tax revenues—for both Iowa and Illinois, presented here were estimated using the IMPLAN model. The labor, turbine, and supply chain impacts of construction and operation of the new wind farms that could result from construction of the proposed transmission line were estimated using the JEDI model.

Operation and Maintenance (O&M)

Clean Line estimates that annual operation and maintenance (O&M) costs, which will be incurred when the line is up and running, will amount to approximately one percent of total construction costs. In Iowa, this will result in $9.4 million in O&M expenditures each year. The corresponding amount for Illinois is $5.6 million. As shown in Table ES-2, the total impacts of annual O&M expenditures in Iowa include 143 jobs and $6.1 million of labor income. The potential impacts of annual O&M expenditures in Illinois include 80 jobs and $4.6 million of labor income.

Table ES-2: Estimated Annual O&M-Related Impacts[1] of the Rock Island Clean Line in Iowa and Illinois

	Iowa	*Illinois*
Employment	143	80
Labor Income	$6.1	$4.6
Output	$15.3	$11.3

[1] All monetary impacts in millions of 2010 $

Fiscal Impacts of the Rock Island Express Clean Line

The IMPLAN model was used to estimate certain tax-related impacts of the projected increases in final demand in Iowa and Illinois. The tax impacts considered here include individual income tax and corporate income tax receipts in Iowa and Illinois. Referring to Table ES-3, it is estimated that Iowa revenues from income taxes paid by individuals and corporations could average as much as $2.17 million and $340 thousand per year, respectively over the three-year construction period. In Illinois, revenues from income taxes paid by individuals and corporations would average $1.25 million per year and $480 thousand per year, respectively over the three-year construction period.

Table ES-3: Estimated Annual[1] Fiscal Impacts[2] of Construction of Rock Island Clean Line in Iowa and Illinois

	Iowa	*Illinois*
Impact	***Annual Average***	***Annual Average***
Individual Income Tax	$2.17	$1.25
Corporate Income Tax	$0.34	$0.48

[1] Construction period = 3 years

[2] All monetary impacts in millions of 2010 $

As was previously noted, once the transmission line is built and is in operation, O&M costs will contribute additional spending to the Iowa and Illinois economies each year. Referring to Table ES-4, in Iowa, individual income tax and corporate income tax receipts resulting from O&M expenditures are predicted to amount to approximately $120 thousand per year. In Illinois, the same revenue sources are predicted to yield approximately $90 thousand per year.

Table ES-4: Summary of Estimated Annual Fiscal Impacts[1] of O&M Expenditures

Impact	*Iowa*	*Illinois*
Individual Income Tax	$0.11	$0.07
Corporate Income Tax	$0.01	$0.02

[1] All monetary impacts in millions of 2010 $

Economic Impacts of Additional Wind Generation Capacity

The construction of the Rock Island Clean Line is expected to stimulate the development of approximately 4,000 MW of wind farms in the tri-state region of Iowa, Nebraska and South Dakota.

More specifically, it is estimated that the transmission line will connect eight new 500 MW wind farms to the transmission grid with five located in Iowa and three elsewhere. The JEDI model, which was used to estimate the economic impacts of the wind farms, contains default values for how these construction and operations and maintenance costs are allocated to the component parts. The JEDI defaults were used for the balance of plant and operating and maintenance costs, but the larger components of a wind turbine—the nacelle, tower, blades, and transportation were examined in more detail. Using information from the American Wind Energy Association's Wind Power Outlook 2010, we estimated that 35 percent of the nacelles, 75 percent of the blades, and 75 percent of the towers used to construct wind farms are made in the United States.[2]

As a result of this increase in wind development, there will be economic benefits throughout the region, both of direct expenditures to build wind farms and of supply chain impacts due to increased demand. To estimate the state-level economic impacts of the new wind generation capacity it was necessary to estimate the percentage of the wind turbine components that would be produced in each state. We constructed three different scenarios in which Iowa and Illinois each account for 15 %, 30%, or 45% of the total domestic content.[3]

Iowa

The total economic impact of the wind farms for the state of Iowa consists of two parts—(1) the economic benefit of the direct expenditures made in the state to build the 2,500 MW of wind farms located there, and (2) the benefit from some of the supply chain impacts of the total 4,000 MW of wind farms no matter where they are built. Table ES-5 shows the total economic impact during the construction period in Iowa under the 15%, 30%, and 45% scenarios. The total employment impacts during construction range from 14,354 to 21,576 jobs, and earnings by $650 million to $1.03 billion under the 15% and 45% scenarios, respectively. It is estimated that when the wind farms built in Iowa are up and running, they will generate 410 jobs and $17 million in earnings annually.

Table ES-5: Economic Impacts[1] of Wind Farm Construction and Operation in Iowa

Total Construction Impacts	***Jobs***	***Earnings***	***Output***
15% Scenario	14,354	$654	$2,126
30% Scenario	17,965	$845	$2,965
45 % Scenario	21,576	$1,034	$3,804
Total Operating Year Impacts: All Scenarios	410	$17	$52

[1] All monetary impacts in millions of 2010 $

[2] See p.23 for a more detailed discussion of the estimation process that was used.

[3] In the case of blades, we shifted the Illinois blade component supply to Iowa because Illinois does not currently have a blade manufacturer, though Illinois may of course be able to attract a new blade manufacturer in the future.

Illinois

While no wind farms are assumed to be built in Illinois as a direct result of the Rock Island Clean Line[4], the state will experience supply chain impacts attributable to wind farms built elsewhere. As shown in Table ES-6, depending on the scenario, the employment impacts during the construction phase are estimated to range from approximately 2,800 to 8,400 jobs, while earnings are estimated to amount to $190 million to $570 million.

Table ES-6: Economic Impacts[1] of Wind Farm Construction in Illinois

Total Construction Impacts	***Jobs***	***Earnings***	***Output***
15% Scenario	2,798	$190	$678
30% Scenario	5,596	$380	$1,355
45 % Scenario	8,394	$570	$2,033

[1] All monetary impacts in millions of 2010 $

In summary, the estimated economic impacts of construction and operation of the Rock Island Line are substantial. When the estimated impacts of the additional wind generation capacity are included, and assuming actual construction of the new wind farms takes approximately one year, total construction-related impacts in the two-state region could amount to approximately 9,886 jobs per year for three years under the 15% scenario . Under the 45% scenario, this figure increases to 14,159 jobs per year for three years. In addition, operation and maintenance of the transmission line and the added wind generation basis could result in the creation of 630 permanent jobs in the two-state region.

[4] See page 29 for further explanation.

I. Background

Rock Island Clean Line LLC ("Clean Line") is proposing to build the Rock Island Clean Line, a 500-mile, high voltage direct current transmission line that will connect approximately 4,000 MW of wind generation in the tri-state region of Iowa, Nebraska, and South Dakota with energy demand centers in Illinois and points farther east. This report summarizes the estimated economic impacts of the Rock Island Clean Line, including both the impacts of construction and operation of the transmission line and production of inputs to the line—towers, wire, real estate services—that are produced in-state, and the impacts of construction and operation of the wind farms this transmission line would enable.

Transmission Line Impacts

The impacts of construction and operation of the transmission line were modeled using the IMPLAN model.[5] The specific impacts analyzed include direct, indirect, and induced effects on employment, income, and output, as well as fiscal impacts—personal and corporate tax revenues—for both Iowa and Illinois. All impacts are reported at the state level for Illinois and Iowa. In addition, national-level estimates of the employment, income, and output impacts of increased spending in the two-state region are reported. All estimated impacts are based on cost-of-construction and cost-of-operation-and-maintenance estimates provided by Clean Line.

Wind Farm Impacts

The construction of the proposed transmission line is also expected to stimulate the construction of additional wind farms in each state. The impacts of construction and operation of these new wind farms were modeled using the JEDI model[6], and include direct, indirect, and induced effects for both Iowa and Illinois. All impacts are reported at the state level for Illinois and Iowa. All estimated impacts are based on estimates of the number of new wind farms, location (state) of each wind farm, number of turbines, and size of turbines (MW) provided by Clean Line Energy Partners. Wind farm cost estimates for the construction costs and operation and maintenance costs were based on the JEDI model estimates. The

[5] IMPLAN is a PC-based program that allows construction of regional input-output models for areas as small as a county. The model allows aggregation of individual county databases for multi-county analysis. IMPLAN was originally developed for the US Department of Agriculture and is maintained and supported by the Minnesota IMPLAN Group, Inc., in Stillwater, Minnesota. IMPLAN is a widely recognized and respected tool for economic impact analysis.

[6] The JEDI model was developed by Marshall Goldberg, Ph.D. for the National Renewable Energy Laboratory and calculates the number of jobs and the amount of money spent on salaries and economic activities generated in a specific location from the construction and operation of a wind power plant. Because the JEDI model is based upon the IMPLAN model multipliers, the two methods of analysis are compatible. The JEDI model is used by most modelers of wind farm economic impacts.

local share of turbines, component parts, materials and personnel were based on JEDI model estimates and information provided by Clean Line.

Limitations of the study

It is also important to note what the analysis of the impacts of construction and operation of the transmission line and new wind farms does not include, specifically:

- the *net effects* of the proposed project, i.e., the potential impacts on existing power generation facilities resulting from the development of the wind farms associated with the Rock Island Clean Line;
- the economic costs of any pass-through rates or taxes that electric customers could be required to pay by utility companies purchasing energy from the Rock Island Clean Line or the proposed wind farms;
- any environmental impacts, costs, or benefits;
- the potential impacts on electric prices and generation costs or fuel prices; and
- the potential impacts of regulations associated with renewable energy.

In addition, the analysis of impacts does not consider the *net effects* of increased demand for the components of the transmission line, construction of the line, operation and maintenance expenditures, and the construction and operations of new wind farms on employment, income, and output in the affected regions.

II. Methodology

The impacts of construction and operation of the transmission line were estimated using the IMPLAN model. The specific impacts analyzed include direct, indirect, and induced effects on employment, labor income, and output, as well as fiscal impacts—personal and corporate tax revenues—for both Iowa and Illinois. The construction of the proposed transmission line is also expected to stimulate the construction of additional wind farms in each state. 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 both Iowa and Illinois.

IMPLAN

The economic impacts of manufacturing of the required components, construction of the line, and operation and maintenance expenses were estimated using the IMPLAN model and 2009 data for Iowa and Illinois. Stated briefly, the model is used to estimate the total impacts of an increase in spending in a particular industry. 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 regional, e.g., county, databases for multi-region analysis.

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 towers that will be used to support a new transmission line. *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 towers. *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 latter 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 transmission line, as well as 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[7] (FTE). 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), i.e., it is a measure of the value of output produced. Impacts are estimated on a statewide basis for both Iowa and Illinois, as well as for the United States as a whole.

JEDI

The economic analysis of wind power development presented here utilizes the National Renewable Energy Laboratory's (NREL's) latest (release number W1.08.03a) Jobs and Economic Development Impacts (JEDI) Wind Energy Model. 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 reveals how purchases of wind project materials not only benefit local turbine manufacturers but also the local industries that supply the concrete, rebar, and other materials. 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 economic activities that are associated with this information. The results are broken down into the construction period and the operation period of the wind project. 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 the direct final demand (i.e., spending on construction labor and services) change 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 and other purchases of goods and offsite services. Concrete that is used in turbine foundations increases the demand for gravel, sand, and cement. Turbine parts/component manufacturers such as bearing producers, steel producers, and gear producers are also in this same category. Indirect impacts during operating years refer to the changes in inter-industry purchases resulting from the direct final demand changes. All land lease payments and property taxes show up in the operating-years portion of the results because these payments do not support the day-to-day operations and maintenance of the wind farm but instead are more of a latent effect that results from the wind farm

[7] IMPLAN jobs include all full-time, part-time, and temporary positions. When employment is counted as full and part-time, one cannot tell from the data the number of hours worked or the proportion that is full or part-time. A full-time-employed (FTE) worker is assumed to work 2,080 hours (= 52 weeks x 40 hours/week) in a standard year. Employment impacts have been rescaled to reflect the change in the number of FTEs.

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 operating years 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.

III. Economic Impacts of the Rock Island Clean Line

Relevant Economic Sectors

In this section, we describe the sectors in which direct spending will increase as a result of construction of the proposed transmission line. These sectors include those engaged in the production of towers and wire, those engaged in the actual building of the transmission line and the installation of converters, and the real estate sector.

Clean Line estimates that production of the necessary inputs (towers, wire, and converters) and construction of the proposed transmission line will cost approximately $1.5 billion. Expenditures are expected to be spread almost evenly over a three-year period. Table 1 summarizes the estimated costs of each of the major components of the line—towers, wire, and converters—as well as the costs of constructing the line, including the cost of acquiring the right-of-way for the line's location. While construction of the line constitutes the single largest component of the total cost (33 percent), the costs of the towers and wire, and installation of the converters are significant as well.

Table 1: Distribution of Transmission Line Construction Expenditures by IMPLAN Sector

Component	*IMPLAN Sector #*	*Sector Title*	*Direct Spending ($ millions)*	*Percent of Total Expenditures*
Towers	186	Plate work and fabricated structural product manufacturing	$280	19%
Wire	272	Communications and energy wire and cable manufacturing	$180	12%
Converters[1]	36	Construction of other nonresidential structures	$175	12%
Construction/Other[2]	36	Construction of other nonresidential structures	$490	33%
Right of Way	360	Real estate	$50	3%
Converters[3]			$325	22%
Total			$1,500	100%

[1] Reflects installation costs only. Total cost (construction and installation) of converters is $500 million. Converters will be purchased overseas at a cost of $325 million.
[2] Other includes construction-related expenses, e.g., project management, permitting, safety, insurance, logistics, etc.
[3] Because the converters are produced overseas, IMPLAN sector information is not relevant, i.e., there are no domestic impacts from construction of the converters.

It is important to note that, as indicated in the notes accompanying Table 1, the project's converters will be produced overseas. It is therefore not appropriate to include the actual purchase price of the converters in the estimate of economic impacts that are reported here. The installation of the converters, however,

does constitute increased spending in each of the two states and is therefore appropriately included when estimating the impacts of spending on the proposed line.[8]

Table 2 includes the information in Table 1 and summarizes the allocation of the input and construction costs between Iowa and Illinois. According to Clean Line's estimates, excluding the cost of the converters (which will be purchased overseas), approximately $777.5 million, or 66 percent, of the costs of building the proposed line are attributable to that portion of the line that will be located in Iowa. The remaining $397.5 million, or 34 percent of costs, will be incurred in building the segment of the line that will be located in Illinois. As indicated in Table 2, it is also assumed that annual O&M expenses (incurred when the line is up and running) will amount to approximately 1 percent of total construction costs.

Table 2: Rock Island Clean Line Inputs for IMPLAN

Component	*IMPLAN Sector*	*Direct Spending ($ millions)*	*Percent of Total Expenditures*	*Construction Budget: Iowa ($ millions)*	*Construction Budget: Illinois ($ millions)*
Construction					
Towers	186	$280	19%	$193.2	$86.8
Wire	272	$180	12%	$124.2	$55.8
Converter Installation	36	$175	12%	$87.5	$87.5
Construction/Other	36	$490	33%	$338.1	$151.9
Right of Way	360	$50	3%	$34.5	$15.5
Subtotal		$1,175.0	78%	$777.5	$397.5
Converters		$325.0	22%	$162.5	$162.5
Total Cost of Construction		$1,500.0	100%	$940.0	$560.0
Operations and Maintenance Annual Average	39	$15.0		$9.4	$5.6

Construction

To estimate the economic impacts of construction of the transmission line, changes in final demand (i.e., the projected increase in total spending attributable to the construction of the proposed transmission line) in each of the relevant sectors were analyzed using the IMPLAN model. Impacts were then aggregated across the different components and types of impacts. Impacts were estimated separately for each the segments of the line that will be located in Iowa and Illinois. Impacts were also estimated at the state

[8] In recent discussions with EPC contractors, it has become clear that domestic tower production may not be capable of handling the magnitude of order a transmission line like the Rock Island Clean Line would entail. That being said, Clean Line will first seek to engage tower manufacturers in the Midwest and United States. It will then explore the global supply chain to source the best quality and appropriate quantity of materials required to complete the project.

level, as well as the national level. In the former, indirect and induced impacts are limited by spending associated with the construction of the line that occurs in other states. Estimating the impacts at the national level captures the majority of this "out-of-state" spending, resulting in larger indirect and induced impacts than those associated with in-state spending.

Iowa

The direct, indirect, induced, and total impacts of increases in final demand for the components—towers, wire—of the new transmission line, installation of the converters, construction of the line, and right-of-way requirements associated with the segment of the line that will be constructed in Iowa are summarized in Table 3.

Table 3: Estimated Impacts of Manufacturing and Construction of Rock Island Clean Line in Iowa

Component	*Change in Final Demand*[1]	*Impact*	*Direct*	*Indirect*	*Induced*	*Total*	*Annual Average*[4]
Towers	$193.2	*Employment*[2]	668	337	343	1,349	450
		Labor Income[3]	$40.8	$15.2	$13.0	$68.9	$23.0
		Output	$193.2	$47.9	$39.6	$280.7	$93.6
Wire	$124.2	*Employment*	228	126	140	494	165
		Labor Income	$16.1	$6.8	$5.3	$28.2	$9.4
		Output	$124.2	$23.8	$16.2	$164.2	$54.7
Converter Installation	$87.5	*Employment*	748	187	266	1,201	400
		Labor Income	$33.4	$9.2	$10.0	$52.7	$17.6
		Output	$87.5	$24.2	$30.7	$142.4	$47.5
Line Construction	$338.1	*Employment*	2,891	722	1,028	4,640	1,547
		Labor Income	$129.1	$35.6	$38.7	$203.5	$67.8
		Output	$338.1	$93.6	$118.5	$550.2	$183.4
Right of Way	$34.5	*Employment*	384	53	34	471	157
		Labor Income	$3.5	$1.9	$1.3	$6.7	$2.2
		Output	$34.5	$6.8	$3.9	$45.2	$15.1
Totals	$777.5	*Employment*	4,919	1,424	1,811	8,154	2,718
		Labor Income	$222.9	$68.8	$68.3	$360.0	$120.0
		Output	$777.5	$196.3	$209.0	$1,182.7	$394.2

1. All spending and $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

According to Table 3, assuming all production and construction-related activities directly tied to the transmission line are completed by in-state firms, manufacturing of the required towers and wire, as well as construction of the transmission line, installation of the converters, and the payment of fees for the required right-of-way would generate substantial economic impacts in Iowa. According to the model's results, in total (i.e., accounting for direct, indirect, and induced impacts), approximately 2,700 jobs would be created in each year of the three-year period during which the line is being constructed. More

than half (964) of the total direct jobs (1,640) created in each of the three years would result specifically from the construction of the proposed line. Labor income impacts would also be substantial with $74.3 million per year in direct impacts. Factoring in indirect and induced income impacts increases the annual average to $120 million.

Illinois

The direct, indirect, induced, and total impacts of increases in final demand for the components—towers, wire—of the new transmission line, installation of the converters, construction of the line, and right-of-way requirements associated with the segment of the line that will be constructed in Illinois are summarized in Table 4.

Table 4: Estimated Impacts of Manufacturing and Construction of Rock Island Clean Line in Illinois

Component	*Change in Final Demand*[1]	*Impact*	*Direct*	*Indirect*	*Induced*	*Total*	*Annual Average*[4]
Towers	$86.8	*Employment*[2]	294	196	214	704	235
		Labor Income[3]	$18.9	$12.9	$11.0	$42.8	$14.3
		Output	$86.8	$39.4	$32.6	$158.9	$53.0
Wire	$55.8	*Employment*	96	76	96	268	89
		Labor Income	$8.4	$5.8	$4.9	$19.1	$6.4
		Output	$55.8	$21.3	$14.6	$91.7	$30.6
Converter Installation	$87.5	*Employment*	626	207	357	1,191	397
		Labor Income	$38.4	$14.3	$18.4	$71.1	$23.7
		Output	$87.5	$39.2	$54.3	$180.9	$60.3
Line Construction	$151.9	*Employment*	1,087	360	620	2,067	689
		Labor Income	$66.7	$24.8	$31.9	$123.4	$41.1
		Output	$151.9	$68.0	$94.2	$314.1	$104.7
Right of Way	$15.5	*Employment*	79	26	20	124	41
		Labor Income	$1.5	$1.4	$1.0	$3.9	$1.3
		Output	$15.5	$4.7	$3.0	$23.2	$7.7
Totals	$397.5	*Employment*	2,182	864	1,307	4,354	1,451
		Labor Income	$133.8	$59.2	$67.3	$260.3	$86.8
		Output	$397.5	$172.5	$198.7	$768.8	$256.3

1. All spending and $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

Referring to Table 4, assuming all production and construction-related activities directly tied to the transmission line are completed by in-state firms, manufacturing of the required towers and wire, as well as construction of the transmission line, installation of the converters, and payment of fees for the required right-of-way would generate substantial economic impacts in Illinois. In total, approximately 1,450 jobs would be created in each year of the three-year period during which the line is being constructed. Approximately half (362) of the total direct jobs (727) created in each of the three years

would result specifically from the construction of the proposed line. Labor income impacts would also be substantial with approximately $45 million per year in direct impacts. Factoring in indirect and induced income impacts increases the annual average to approximately $87 million.

United States

The state-level impacts reported in Tables 3 and 4 reflect the increased spending that is estimated to occur within each state's respective boundaries. It is important to recognize, however, that some amount of indirect and induced spending occurs in states other than Iowa or Illinois. To the extent that this spending occurs elsewhere in the United States, the remaining 48 states benefit from the construction, operation, and maintenance of the proposed transmission line as well. To capture the indirect and induced effects of this additional spending at the national level, the impacts of the state-specific expenditures summarized in Table 2 were re-estimated for the region consisting of the entire United States. To hold constant the characteristics of each industry that is assumed to experience the initial increase in final demand in each state, e.g., construction of towers in Iowa, the national model was recalibrated to reflect the industry-specific characteristics in each sector (IMPLAN sectors 36, 39, 186, 272, 360) and state in which final demand would initially increase. (If the specific U.S. industry relationships (output per worker, ratio of employee compensation to output, etc.) were not revised to reflect the relevant state-specific (i.e., Iowa, Illinois) relationships, the differences reported in Tables 5 and 6 would be due not only to internalizing trade flow at the U.S. level, but to differences in the industry at the state versus national level as well.)

The results of the estimation of national-level impacts are reported in Tables 5 and 6. It is important to note that the direct impacts reported in Tables 5 and 6 match those reported in Tables 3 and 4, respectively. This is due to the recalibration described in the preceding paragraph. Inspection of the indirect and induced impacts shows that these effects are considerably larger at the national level than they are at the state level. Once again, this reflects the capture of indirect and induced spending that occurs in one or more of the remaining 48 states.

Iowa-US

The national-level impacts of increases in final demand for the components of the new transmission line—towers, wire, installation of the converters, construction of the line, and right-of-way requirements—associated with the segment of the line that will be constructed in Iowa are summarized in Table 5.

Table 5: Estimated National-Level Impacts of Manufacturing and Construction of Rock Island Clean Line in Iowa

Component	*Change in Final Demand*[1]	*Impact*	*Direct*	*Indirect*	*Induced*	*Total*	*Annual Average*[4]
Towers	$193.2	*Employment*[2]	668	878	990	2,536	845
		Labor Income[3]	$40.8	$55.9	$50.5	$147.1	$49
		Output	$193.2	$210.4	$161.1	$564.8	$188
Wire	$124.2	*Employment*	228	476	511	1,215	405
		Labor Income	$16.1	$33.6	$26.1	$75.8	$25
		Output	$124.2	$181.4	$83.2	$388.9	$130
Converter Installation	$87.5	*Employment*	748	384	593	1,725	575
		Labor Income	$33.4	$24.7	$30.2	$88.4	$29
		Output	$87.5	$80.6	$96.4	$264.5	$88
Line Construction	$338.1	*Employment*	2,891	1,484	2,290	6,664	2,221
		Labor Income	$129.1	$95.5	$116.8	$341.4	$114
		Output	$338.1	$311.4	$372.4	$1,021.9	$341
Right of Way	$34.5	*Employment*	384	75	71	530	177
		Labor Income	$3.5	$3.5	$3.6	$10.7	$4
		Output	$34.5	$11.6	$11.3	$57.4	$19
Totals	$777.5	*Employment*	4,919	3,297	4,455	12,670	4,223
		Labor Income	$222.9	$213.2	$227.3	$663.4	$221
		Output	$777.5	$795.4	$724.5	$2,297.4	$766

1. All spending and $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

According to Table 5, the indirect and induced impacts of spending on production and construction-related activities associated with that segment of the proposed transmission line located in Iowa increase substantially when the scope of the analysis is expanded to the national level. Total employment impacts increase by approximately 4,500, to approximately 12,670 full-time equivalent jobs over the three-year construction period. Total labor income increases by $303 million, to $663 million.

Illinois-US

The national-level impacts of increases in final demand for the components of the new transmission line—towers, wire, installation of the converters, construction of the line, and right-of-way requirements—associated with the segment of the line that will be constructed in Illinois are summarized in Table 6.

As shown in Table 6, indirect and induced impacts of spending and production and construction-related activities associated with that segment of the proposed transmission line located in Illinois increase substantially when the scope of the analysis is expanded to the national level. Total employment impacts

increase by approximately 1,745, to approximately 6,100 full-time equivalent jobs over the three-year construction period. Total labor income increases by $95 million, to $355 million.

Table 6: Estimated National-Level Impacts of Manufacturing and Construction of Rock Island Clean Line in Illinois

Component	Change in Final Demand[1]	Impact	Direct	Indirect	Induced	Total	Annual Average[4]
Towers	$86.8	*Employment*[2]	294	388	446	1,128	376
		Labor Income[3]	$18.9	$24.7	$22.8	$66.4	$22.1
		Output	$86.8	$93.1	$72.7	$252.5	$84.2
Wire	$55.8	*Employment*	96	203	234	534	178
		Labor Income	$8.4	$14.4	$12.0	$34.8	$11.6
		Output	$55.8	$77.6	$38.2	$171.6	$57.2
Converter Installation	$87.5	*Employment*	626	337	608	1,571	524
		Labor Income	$38.4	$21.7	$31.0	$91.1	$30.4
		Output	$87.5	$70.6	$98.9	$257.0	$85.7
Line Construction	$151.9	*Employment*	1,087	585	1,056	2,728	909
		Labor Income	$66.7	$37.6	$53.9	$158.1	$52.7
		Output	$151.9	$122.6	$171.7	$446.2	$148.7
Right of Way	$15.5	*Employment*	79	33	32	144	48
		Labor Income	$1.5	$1.7	$1.6	$4.9	$1.6
		Output	$15.5	$5.8	$5.3	$26.6	$8.9
Totals	$397.5	*Employment*	2,182	1,546	2,376	6,105	2,035
		Labor Income	$133.9	$100.1	$121.3	$355.2	$118.4
		Output	$397.5	$369.8	$386.7	$1,154.0	$384.7

1. All spending and $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

Operations and Maintenance

Clean Line estimates that annual operation and maintenance (O&M) costs, which will be incurred when the line is up and running, will amount to approximately one percent of total construction costs. In Iowa, this amounts to $9.4 million of additional spending each year. The corresponding amount for Illinois is $5.6 million. The estimated impacts of annual O&M expenditures in each state are summarized in Tables 7 and 8.

Iowa

As shown in Table 7, the direct effects of annual O&M expenditures in Iowa include 92 jobs and $4 million in labor income. These impacts increase to 143 jobs and $6.1 million of labor income when indirect and induced impacts are factored in.

Table 7: Estimated Impacts of Annual O&M-Related Expenditures on Rock Island Clean Line in Iowa (Total annual spending = $9.4 million)

Impact[1]	Direct	Indirect	Induced	Total
Employment[2]	92	20	31	143
Labor Income[3]	$4.0	$0.9	$1.2	$6.1
Output	$9.4	$2.3	$3.5	$15.3

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income

Illinois

As shown in Table 8, the direct effects of annual O&M expenditures in Illinois include 45 jobs and $2.7 million in labor income. These impacts increase to 80 jobs and $4.6 million of labor income when indirect and induced impacts are factored in.

Table 8: Estimated Impacts of Annual O&M-Related Expenditures on Rock Island Clean Line in Illinois (Total annual spending = $5.6 million)

Impact[1]	*Direct*	*Indirect*	*Induced*	*Total*
Employment[2]	45	12	23	80
Labor Income[3]	$2.7	$0.8	$1.2	$4.6
Output	$5.6	$2.1	$3.5	$11.3

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income

United States

As was the case with state-level production and construction-related impacts, to capture the indirect and induced effects of leakages from state-level spending at the national level, the impacts of the state-specific O&M-related expenditures summarized in Tables 7 and 8 were re-estimated for the region consisting of the entire United States. The results are reported in Tables 9 and 10.

Iowa-US

As shown in Table 9, the indirect and induced impacts of O&M-related expenditures associated with that segment of the proposed transmission line located in Iowa increase substantially when the scope of the analysis is expanded to the national level. Total employment impacts increase by approximately 50, to approximately 192 full-time equivalent jobs. Total labor income increases by $3.4 million, to $9.5 million.

Table 9: Estimated National-Level Impacts of Annual O&M-Related Expenditures on Rock Island Clean Line in Iowa (Total Annual spending = $9.4 million)

Impact[1]	*Direct*	*Indirect*	*Induced*	*Total*
Employment[2]	92	36	64	192
Labor Income[3]	$4.0	$2.2	$3.3	$9.5
Output	$9.4	$7.5	$10.4	$27.3

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income

Illinois-US

As shown in Table 10, the indirect and induced impacts of O&M-related expenditures associated with that segment of the proposed transmission line located in Illinois also increase substantially when the scope of the analysis is expanded to the national level. Total employment impacts increase by 23, to 103 full-time equivalent jobs. Total labor income increases by $1.2 million, to $5.8 million.

Table 10: Estimated National-Level Impacts of Annual O&M-Related Expenditures on Rock Island Clean Line in Illinois (Total Annual spending = $5.6 million)

Impact[1]	*Direct*	*Indirect*	*Induced*	*Total*
Employment[2]	45	19	39	103
Labor Income[3]	$2.7	$1.2	$2.0	$5.8
Output	$5.6	$3.9	$6.4	$15.9

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income

Summary of Estimated Construction and O&M Related Impacts

This section provides a more aggregated view of the various impacts reported in Tables 3-10. Table 11 summarizes the average annual impacts of production of the inputs to, and construction of, the proposed transmission line at the state and national levels that would occur in each year of the three year construction period.

Table 11: Estimated Impacts of Manufacturing and Construction of Rock Island Clean Line in Iowa, Illinois, the Two-State Region, and the United States

		Iowa	***Illinois***	***Combined***	***United States***
Component	***Impacts***[1]	***Annual Avg.***	***Annual Avg.***	***Annual Avg.***	***Annual AVG***[4]
Towers	*Employment*[2]	450	235	685	1,221
	Labor Income[3]	$23.0	$14.3	$37.2	$71.2
	Output	$93.6	$53.0	$146.5	$272.4
Wire	*Employment*	165	89	254	583
	Labor Income	$9.4	$6.4	$15.8	$36.9
	Output	$54.7	$30.6	85.3	$186.8
Converter Installation	*Employment*	400	397	797	1,099
	Labor Income	$17.6	$23.7	$41.2	$59.8
	Output	$47.5	$60.3	$107.8	$173.8
Line Construction	*Employment*	1,547	689	2,236	3,131
	Labor Income	$67.8	$41.1	$108.9	$166.5
	Output	$183.4	$104.7	$288.1	$489.4
Right of Way	*Employment*	157	41	198	225
	Labor Income	$2.2	$1.3	$3.6	$5.2
	Output	$15.1	$7.7	$22.8	$28.0
Totals	*Employment*	2,718	1,451	4,169	6,258
	Labor Income	$120.0	$86.8	$206.8	$339.5
	Output	$394.2	$256.3	$650.5	$1,150.5

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

The various figures reported in Table 11 for Iowa, Illinois, and the two-state region can be viewed as an upper bound on the impacts in question. Thus, for example, assuming all production and construction-related activities are completed by in-state firms in Iowa and Illinois, over the projected period the employment impact in the two-state region could potentially average approximately 4,170 jobs per year for three years. When spending that occurs outside of the two-state region is accounted for, average employment impacts would increase to 6,260 jobs per year. Projected income impacts would be substantial as well. Assuming, once again, that all production and construction-related activities are completed by in-state firms in Iowa and Illinois, over the projected period the labor income impact in the two-state region would average approximately $207 million per year for three years. When spending

occurring in the remainder of the country is accounted for, average labor income impacts would increase to $340 million per year for three years.

While we have already emphasized that the impacts reported in Table 11 reflect the assumption that all production and construction-related activities are completed by in-state firms, this assumption warrants further consideration. In particular, the reasonableness of the projected impacts can be assessed, to a first approximation, by examining the potential for existing industries to accommodate the projected increases in demand associated with the proposed transmission line. Table 12 summarizes employment levels in each of the affected industries in Iowa and Illinois in 2009, as well as the projected annual increases in employment in each of the four directly impacted sectors (Plate work and fabricated structural product manufacturing, Communications and energy wire and cable manufacturing, Construction of other nonresidential structures, and Real estate) in both absolute and percentage terms.

Table 12: Comparison of Baseline Employment to Projected Impacts in Iowa and Illinois

Component *(Sector Title)*	***2009 Totals***		***Projected Annual Increase***		***Percent Increase***	
Employment	***Iowa***	***Illinois***	***Iowa***	***Illinois***	***Iowa***	***Illinois***
Towers *(Plate work and fabricated structural product manufacturing)*	2,534	6,858	244	108	9.6%	1.6%
Wire *(Communications and energy wire and cable manufacturing)*	5	713	79	33	1580%	4.6%
Converter Installation/Line Construction *(Construction of other nonresidential structures)*	38,534	127,752	1,213	571	3.1%	0.45%
Right of Way *(Real estate)*	55,122	273,584	250	88	0.45%	0.03%

According to the data in Table 12, in Illinois, all four of the affected sectors should be able to absorb the increased demand associated with production of the required components and construction of the proposed transmission line. The only possible exception is production of the needed wire. The "Communications and energy wire and cable manufacturing sector" would see a roughly 4.6 percent increase in employment. Considering, however, the current state of the economy, there is likely sufficient excess capacity within the industry in Illinois to absorb the projected increases. In the case of Iowa, it is reasonable to expect that both the "Construction of other nonresidential structures" and "Real estate" sectors could easily accommodate the projected increases in demand. Depending upon available excess capacity, as well as the ability in rapidly increase production, the "Plate work and fabricated structural product manufacturing sector," which produces the needed towers, might be able to handle the projected increase in demand as well. The information in Table 12 strongly indicates, however, that the "Communications and energy wire and cable manufacturing sector" in Iowa would be unable to produce

all of the wire needed for the proposed line. This means that a more reasonable estimate of total impacts in Iowa would reflect only the impacts associated with increases in final demand in the remaining three sectors. The information in Table 11 was subsequently adjusted to reflect the likely inability of the "Communications and energy wire and cable manufacturing sector" in Iowa to meet the increase in final demand associated with construction of the proposed transmission line. The results of this adjustment process are reflected in Table 13.

Table 13: Modified Estimate of the Impacts of Manufacturing and Construction of Rock Island Clean Line in Iowa, Illinois, the Two-State Region, and the United States

		Iowa	***Illinois***	***Combined***	***United States***
Component	***Impacts***[1]	***Annual Avg.***	***Annual Avg.***	***Annual Avg.***	***Annual AVG***[4]
Towers	*Employment*[2]	450	235	685	1,221
	Labor Income[3]	$23.0	$14.3	$37.2	$71.2
	Output	$93.6	$53.0	$146.5	$272.4
Wire	*Employment*	---	89	89	580
	Labor Income	---	$6.4	$6.4	$37.8
	Output	---	$30.6	$30.6	$186.6
Converter Installation	*Employment*	400	397	797	1,099
	Labor Income	$17.6	$23.7	$41.3	$59.8
	Output	$47.5	$60.3	$107.8	$173.8
Line Construction	*Employment*	1,547	689	2,236	3,131
	Labor Income	$67.8	$41.1	$108.9	$166.5
	Output	$183.4	$104.7	$288.1	$489.4
Right of Way	*Employment*	157	41	198	225
	Labor Income	$2.2	$1.3	$3.5	$5.2
	Output	$15.1	$7.7	$22.8	$28.0
Totals	*Employment*	2,554	1,451	4,005	6,255
	Labor Income	$110.6	$86.8	$197.3	$340.4
	Output	$339.6	$256.3	$595.8	$1,150.3

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income
4. Assumes a three-year construction period

Table 13, while fairly similar to Table 11, differs in two specific ways. First, as shown in the third column, we assumed that none of the wire required for the project will be produced in Iowa. As such, the estimated employment impacts associated with the construction of the transmission line in Iowa and the two-state region are reduced to approximately 2,555 and 4,000 jobs per year for three years, respectively. Estimated labor income impacts fall slightly as well. The second difference concerns the estimate of impacts at the national level. To be specific, because we cannot predict where the needed wire might be produced within the United States, we reran the estimated impact of production of the wire that will be used in the Iowa portion of the transmission line based on nation-wide characteristics of the

"Communications and energy wire and cable manufacturing sector."[9] Comparison of the last column of Table 13 with the last column in Table 11 reveals that this had, at best, a negligible impact on estimated impacts.

Operations and Maintenance

Table 14 summarizes the annual impacts of operations and maintenance of the proposed transmission line at the state and national levels. Unlike the construction-related impacts, which would cease after the three-year construction period, the O&M impacts would be sustained for the foreseeable future as these recur on an annual basis.

Table 14: Estimated Impacts of Annual O&M-Related Expenditures on Rock Island Clean Line in Iowa, Illinois, the Two-State Region, and the United States

Impact[1]	***Iowa***	***Illinois***	***IA+IL***	***US***
Employment[2]	143	80	223	295
Labor Income[3]	$6.1	$4.6	$10.7	$15.3
Output	$15.3	$11.3	$26.6	$43.2

1. All $ impacts are in millions of 2010 $ and are rounded.
2. All employment figures are full time equivalents
3. Labor Income = Employee compensation + Proprietor income

[9] See the discussion on page 14 for further explanation of how impacts at the national level were estimated.

IV. Economic Impacts of Associated Wind Farms

It is estimated that the Rock Island Clean Line will connect approximately 4,000 MW of new wind farms to the transmission grid. For this analysis, we assumed that 2,500 MW will be built in Iowa, 1,500 MW will be built elsewhere, and each wind farm will be 500 MW in size. Each wind farm is assumed to entail construction costs of $2,000 per kW and operation and maintenance costs of $20 per kW. The JEDI model, which was used to estimate the economic impacts, contains default values for how these construction and operations and maintenance costs are allocated into their component parts. The JEDI defaults were used for the balance of plant and operating and maintenance costs, but the larger components of a wind turbine—the nacelle, tower, blades, and transportation were examined in more detail. In order to estimate the economic impacts, it is critical to understand how much of these wind turbine components will come from the United States for the national impacts and how much of the components will come from Iowa and Illinois for the state analyses. According to the American Wind Energy Association's Wind Power Outlook 2010, domestic content will rise to 50 percent in 2010. Using 50 percent domestic content as a guideline, we assumed that 35 percent of the nacelles, 75 percent of the blades, and 75 percent of the towers will be produced in the United States. This yielded an overall cost-weighted average of domestic content of 48 percent.

To estimate the state-level economic impacts it was necessary to estimate what percentage of the components would be produced in each state. Both Illinois and Iowa have robust supply chains as evidenced by the number of component manufacturers listed in Tables 15 and 16. Because it is impossible to know which companies in which states will build components for the proposed wind farms until they are actually built, we estimated the economic impacts using three different scenarios. Given the overall domestic content from the national model, we assume that Iowa and Illinois each obtain 15% (scenario 1), 30% (scenario 2) or 45% (scenario 3) of the total domestic content. In the case of blades, Illinois does not currently have any blade manufacturers, and Iowa has two. Therefore, we shifted the Illinois blade component supply to Iowa. Table 17 summarizes the different scenarios that were estimated.

Table 15 : Major Iowa Wind Turbine Component Manufacturers

Company	*Component*
Acciona Windpower, West Branch, IA	Nacelle assembly
Clipper Windpower, Cedar Rapids, IA	Nacelle assembly
Electrical Engineering & Equipment, Windsor Heights, IA	Electric components
Goian North America, Des Moines, IA	Lifts for people and equipment inside towers
Heartland Energy Solutions, Mount Ayr, IA	Wind Turbines and blades
NextEra Energy Resources, Story City, IA	Overhaul and repair
Quad City Safety, Davenport, IA	Safety Supplies
Siemens Energy, Ft. Madison, IA	Blades
SSAB Iowa, Muscatine, IA	Plate steel for towers
3E Electrical Engineering, Windsor Heights, IA	electrical components
TPI Composites, Newton, IA	Blades
Trinity Structural Towers, Newton, IA	Towers
Van Meter Industrial, Cedar Rapids, IA	Electrical components

Table 16: Major Illinois Wind Turbine Component Manufacturers

Company	*Component*
Brad Foote Gear Works, Cicero, IL	Gears
Trinity Industries, Clinton, IL	Towers
S&C Electric, Chicago, IL	Electric components
Winergy Drive Systems, Elgin, IL	Gear boxes
Flender, Elgin, IL	Gear boxes, couplings
Chicago Industrial Fasteners, Chicago, IL	Fasteners
Finkl & Sons, Chicago, IL	Component castings and forgings
Alton Chemical, Sauget, IL	Components, misc.
Centa Corp., Aurora, IL	Components, misc.
G&W Electrical. Blue Island, IL	Electrical components
Hydac, Glendale Heights, IL	Hydraulics
Ingersol Machine Tools, Rockford, IL	Machining
NTN Bearings, Macolm, IL	Bearings
Specialty Metal Fabricators, Minonk, IL	Machining
Stanley Machining, Carpentersville and Hampshire, IL	Machining

Table 17: Scenarios for Location of Wind Turbine Components

		Iowa			*Illinois*		
Component	*National*	*15%*	*30%*	*45%*	*15%*	*30%*	*45%*
Turbines	35%	5.25%	10.50%	15.75%	5.25%	10.50%	15.75%
Blades	75%	22.50%	45.00%	67.50%	0.00%	0.00%	0.00%
Towers	75%	11.25%	22.50%	33.75%	11.25%	22.50%	33.75%
Transportation	100%	15.00%	30.00%	45.00%	15.00%	30.00%	45.00%

Iowa

The economic impact in Iowa has two parts: the total impact of the wind farms that are built in Iowa (2,500 MW) and the supply chain effects from wind farms built elsewhere (1,500 MW). Each impact was modeled separately and is reported in the following tables. The combined overall impact of construction of new wind farms in Iowa is shown in tables 26 through 28.

Iowa Wind Farms

Table 18 displays the direct expenditure estimates from the JEDI model under the three scenarios outlined earlier for the 2,500 MW of wind farms built in Iowa. The only change that occurs among the scenarios is the amount of installed project costs that are spent in Iowa. The Iowa spending is $1.230 billion in the 15% scenario and $1.961 billion in the 45% scenario. The JEDI model estimates annual operational expenses for the 2,500 MW of Iowa wind farms at $821 million. Total operating and maintenance costs amount to $50 million, with $14 million spent in Iowa. Taxes, financing costs, land leases and other expenses amount to $771 million, with $19 million spent in Iowa.

Table 18: Iowa Direct Expenditure[1] Estimates from JEDI Model for 2,500 MW of Iowa Wind Farms ($ millions)

	15% Scenario	*30% Scenario*	*45% Scenario*
Installed Project Cost	$4,999	$4,999	$4,999
Local (Iowa) Spending	$1,230	$1,595	$1,961
Total Annual Operational Expenses (O&M, financing costs, lease payments, and taxes)	$821	$821	$821
Direct Operating and Maintenance Costs	$50	$50	$50
Local (Iowa) Spending	$14	$14	$14
Other Annual Costs (Taxes, financing costs, land leases, etc.)	$771	$771	$771
Local (Iowa) Spending	$19	$19	$19

[1] millions of 2010 $

As shown in Table 19, the jobs created during construction include approximately 1,300 FTE for project development and on-site labor, 9,320 FTE for turbine and supply chain labor and 2,380 FTE for induced impacts for a total of 13,000 FTE. During the operating years, on-site labor is 125 FTE, local revenue and supply chain impacts are 188 FTE, and induced impacts are 97 FTE, resulting in a total of 410 FTE jobs. During construction, earnings will increase by a total of $583 million and total output will increase by approximately $1.8 billion. During the operating years, earnings will increase by $17 million and total output will increase by $52 million annually.

Table 19: Iowa Wind Farms Economic Impacts from JEDI Model for 2,500 MW of Iowa Wind Farms—Summary Results for 15% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	9,321	$432	$1,467
Induced Impacts	2,383	$85	$264
Total Impacts	13,000	$583	$1,811
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Table 20 shows the economic impacts for the 30% scenario. In this case, impacts amount to approximately 15,260 jobs and $2.34 billion in output during construction and 410 jobs and $52 million in output remain the same during the operating years. As shown in Table 21, impacts increase to 17,514 jobs and $2.86 billion in output during construction under the 45% scenario.

Table 20: Iowa Wind Farms Economic Impacts from JEDI Model for 2,500 MW of Iowa Wind Farms—Summary Results for 30% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	11,048	$532	$1,932
Induced Impacts	2,912	$104	$323
Total Impacts	15,257	$702	$2,336
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Table 21: Iowa Wind Farms Economic Impacts from JEDI Model for 2,500 MW of Iowa Wind Farms—Summary Results for 45% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	12,776	$632	$2,398
Induced Impacts	3,442	$123	$382
Total Impacts	17,514	$820	$2,860
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Iowa Supply Chain

The second part of the Iowa economic impact is the supply chain effects attributable to the 1,500 MW of wind farms built outside of Iowa. Here, we are measuring the economic impact of wind turbine parts that are built in Iowa for wind farms elsewhere. Table 22 summarizes the direct expenditure estimates under the three different scenarios. Once again, the only difference among the three scenarios is the amount of installed project cost that would be spent in Iowa. This amount ranges from $219 million in the 15% scenario to $658 million in the 45% scenario. Note that the local Iowa spending during the operating years is zero because these wind farms are located outside of Iowa.

Table 22 : Iowa Direct Expenditure Estimates from JEDI Model for 1,500 MW of Wind Farms built Outside of Iowa ($ millions)

	15% Scenario	*30% Scenario*	*45% Scenario*
Installed Project Cost	$2,999	$2,999	$2,999
Local (Iowa) Spending	$219	$439	$658
Total Annual Operational Expenses (O&M, financing costs, lease payments, and taxes)	$492	$492	$492
Direct Operating and Maintenance Costs	$30	$30	$30
Local (Iowa) Spending	$0	$0	$0
Other Annual Costs (Taxes, financing costs, land leases, etc.)	$462	$462	$462
Local (Iowa) Spending	$0	$0	$0

Tables 23 through 25 summarize the impacts associated with each of the three different scenarios. Depending on the scenario, employment impacts range from approximately 1,350 (15% scenario) to 4,060 (45% scenario) FTE jobs, and output impacts range from $315 million (15% scenario) to $944 million (45% scenario). There are no operating year impacts because the wind farms are located outside of Iowa.

Table 23 : Iowa Supply Chain Economic Impacts from JEDI Model for 1,500 MW of Wind Farms built Outside of Iowa—Summary Results for 15% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	1,036	$60	$279
Induced Impacts	318	$11	$35
Total Impacts	1,354	$71	$315

Table 24: Iowa Supply Chain Economic Impacts from JEDI Model for 1,500 MW of Wind Farms built Outside of Iowa—Summary Results for 30% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	2,073	$120	$559
Induced Impacts	635	$23	$71
Total Impacts	2,708	$143	$629

Table 25: Iowa Supply Chain Economic Impacts from JEDI Model for 1,500 MW of Wind Farms built Outside of Iowa—Summary Results for 45% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	3,109	$180	$838
Induced Impacts	953	$34	$106
Total Impacts	4,062	$214	$944

Tables 26 through 28 show the combined effects of the total impacts of wind farms built in Iowa and the supply chain impacts of wind farms built elsewhere. Total employment impacts are 14,354, 17,965, and 21,576 for the 15% scenario, 30% scenario, and 45% scenario, respectively. Output impacts amount $2.2 billion, $2.965 billion, and $3.8 million, respectively. The operating year impacts include 410 jobs and $52 million in output annually and remain unchanged under each scenario.

Table 26: Iowa Total Economic Impacts for 4,000 MW of Wind Farms—Combined Results for 15% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	10,357	$492	$1,746
Induced Impacts	2,701	$96	$299
Total Impacts	14,354	$654	$2,126
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Table 27: Iowa Total Economic Impacts for 4,000 MW of Wind Farms—Combined Results for 30% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	13,121	$652	$2,491
Induced Impacts	3,547	$127	$394
Total Impacts	17,965	$845	$2,965
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Table 28: Iowa Total Economic Impacts for 4,000 MW of Wind Farms—Combined Results for 45% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	1,296	$65	$80
Turbine and Supply Chain Impacts	15,885	$812	$3,236
Induced Impacts	4,395	$157	$488
Total Impacts	21,576	$1,034	$3,804
During Operating Years (annual)			
Onsite Labor Impacts	125	$6	$6
Local Revenue and Supply Chain Impacts	188	$7	$35
Induced Impacts	97	$3	$11
Total Impacts	410	$17	$52

Illinois

Because none of the wind farms are assumed to be built in Illinois, we only considered the supply chain aspects of the new wind farm capacity. In addition, we considered the full 4,000 MWs of wind capacity because there is no difference to the Illinois supply chain if the wind farms are built in Iowa or another state. The total direct expenditure estimates for the three scenarios are summarized in Table 29. Once again, the only difference among the different scenarios is the amount of project cost that is predicted to be spent in Illinois. This ranges from $391 million under the 15% scenario to $1.173 billion under the 45% scenario.

Table 29: Illinois Direct Expenditure Estimates from JEDI Model for 4,000 MW of Wind Farms built Outside of Illinois ($ millions)

Expenditures	*15% Scenario*	*30% Scenario*	*45% Scenario*
Installed Project Cost	$8,000	$8,000	$8,000
Local (Illinois) Spending	$391	$782	$1,173
Total Annual Operational Expenses (O&M, financing costs, lease payments, and taxes)	$1,323	$1,323	$1,323
Direct Operating and Maintenance Costs	$80	$80	$80
Local (Illinois) Spending	$0	$0	$0
Other Annual Costs (Taxes, financing costs, land leases, etc.)	$1,243	$1,243	$1,243
Local (Illinois) Spending	$0	$0	$0

Tables 30 through 32 summarize the impacts under the different scenarios. Employment impacts range from approximately 2,800 to 8,400 jobs, and output impacts range from $678 million to $2.03 billion. There are no operating year impacts because the wind farms are assumed to be located outside of Illinois.

Table 30: Illinois Supply Chain Economic Impacts from JEDI Model for 4,000 MW of Wind Farms built Outside of Illinois—Summary Results for 15% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	1,998	$149	$558
Induced Impacts	800	$41	$120
Total Impacts	2,798	$190	$678

Table 31: Illinois Supply Chain Economic Impacts from JEDI Model for 4,000 MW of Wind Farms built Outside of Illinois—Summary Results for 30% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	3,996	$298	$1,116
Induced Impacts	1,600	$82	$240
Total Impacts	5,596	$380	$1,355

Table 32: Illinois Supply Chain Economic Impacts from JEDI Model for 4,000 MW of Wind Farms built Outside of Illinois—Summary Results for 45% Scenario

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	0	$0	$0
Turbine and Supply Chain Impacts	5,994	$447	$1,673
Induced Impacts	2,401	$123	$360
Total Impacts	8,394	$570	$2,033

United States

The modeling for the United States impacts assumes that 35 percent of the nacelles, 75 percent of the blades, and 75 percent of the towers are manufactured in the United States for all 4,000 MW of new generating capacity. Table 33 summarizes the direct expenditure estimates.

Table 33: United States Direct Expenditure Estimates from JEDI Model of 4,000 MW of Wind Farms ($ millions)

Expenditure	*Amount*
Installed Project Cost	$7,999
Local (U.S.) Spending	$5,200
Total Annual Operational Expenses (O&M, financing costs, lease payments, and taxes)	$1,325
Direct Operating and Maintenance Costs	$80
Local (U.S.) Spending	$52
Other Annual Costs (Taxes, financing costs, land leases, etc.)	$1,245
Local (U.S.) Spending	$1,245

Table 34 summarizes the national economic impacts resulting from the 4,000 MW of wind farms. During construction, approximately 76,040 jobs will be created and during the operating years, 3,980 jobs will be created. Total output is predicted to increase by approximately $14.9 billion during construction and $1.1 billion during operation.

Table 34 : United States Direct Expenditure Estimates from JEDI Model of 4,000 MW of Wind Farms—Summary Results

	Jobs	*Earnings ($ millions)*	*Output ($ millions)*
During Construction Period			
Project Development and Onsite Labor Impacts	3,339	$232	$294
Turbine and Supply Chain Impacts	42,485	$2,663	$9,760
Induced Impacts	30,217	$1,502	$4,838
Total Impacts	76,041	$4,398	$14,892
During Operating Years (annual)			
Onsite Labor Impacts	200	$11	$11
Local Revenue and Supply Chain Impacts	1,599	$92	$751
Induced Impacts	2,181	$108	$349
Total Impacts	3,980	$212	$1,111

V. Fiscal Impacts: Transmission Line Construction and Operations

The IMPLAN model can also be used to estimate various tax-related impacts of a projected increase in final demand in the economy. The tax impacts considered here include individual income taxes and corporate income taxes paid by individuals and businesses in Iowa and Illinois. Two caveats must be kept in mind when reviewing the tax impacts reported in the following tables. First, the tax impacts reported here do not reflect any specific tax-related incentives that either state might offer to Clean Line. Second, in the case of Illinois, the reported impacts are based on the tax system in place as of December, 2010.

Construction

Projected increases in tax revenues in Iowa and Illinois attributable to increases in final demand for the components of the new transmission line—towers and wire—as well as installation of the converters, construction of the line, and right-of-way requirements associated with the line are summarized in Tables 35 and 36.

Table 35: Estimated Fiscal Impacts of Manufacturing and Construction of Rock Island Clean Line in Iowa

Component	*Impact*[1]	*Direct*	*Indirect*	*Induced*	*Total*	*Annual Average*[2]
Towers	*Individual Income Tax*	$0.72	$0.27	$0.23	$1.22	$0.41
	Corporate Income Tax	$0.20	$0.05	$0.05	$0.30	$0.10
Wire	*Individual Income Tax*	$0.28	$0.12	$0.10	$0.50	$0.17
	Corporate Income Tax	$0.09	$0.02	$0.02	$0.13	$0.04
Converter Installation	*Individual Income Tax*	$0.61	$0.17	$0.18	$0.96	$0.32
	Corporate Income Tax	$0.03	$0.02	$0.04	$0.09	$0.03
Line Construction	*Individual Income Tax*	$2.35	$0.65	$0.69	$3.69	$1.23
	Corporate Income Tax	$0.11	$0.08	$0.16	$0.35	$0.12
Right of Way	*Individual Income Tax*	$0.06	$0.03	$0.02	$0.12	$0.04
	Corporate Income Tax	$0.12	$0.01	$0.01	$0.14	$0.05
Totals	*Individual Income Tax*	$4.03	$1.24	$1.22	$6.50	$2.17
	Corporate Income Tax	$0.55	$0.19	$0.29	$1.02	$0.34

1. All impacts are in millions of 2010 $ and are rounded.
2. Assumes a three-year construction period

Iowa

According to the information in Table 35, accounting for direct, indirect, and induced impacts, in Iowa, revenues from income taxes paid by individuals would average $2.17 million per year and corporate income taxes would average $340 thousand per year over the three-year construction period. It is important to recall, however, the discussion of Table 12 which highlights the likelihood that the "Communications and energy wire and cable manufacturing sector" in Iowa will be unable to produce all of the wire needed for the proposed line. This means that a more reasonable estimate of total fiscal

impacts in Iowa would reflect only the impacts associated with increases in final demand in the remaining three sectors (Plate work and fabricated structural product manufacturing, Construction of other nonresidential structures, and Real estate).

Illinois

The tax impacts of increases in final demand for the components of the new transmission line—towers, wire, installation of the converters, construction of the line, and right-of-way requirements—associated with segment of the transmission line that will be constructed in Illinois are summarized in Table 36. According to the information in Table 35, accounting for direct, indirect, and induced impacts, in Illinois, revenues from income taxes paid by individuals would average $1.25 million per year and corporate income taxes would average $480 thousand per year over the three-year construction period.

Table 36: Estimated Fiscal Impacts of Manufacturing and Construction of Rock Island Clean Line in Illinois

Component	*Impact*[1]	*Direct*	*Indirect*	*Induced*	*Total*	*Annual Average*[2]
Towers	*Individual Income Tax*	$0.27	$0.18	$0.16	$0.61	$0.20
	Corporate Income Tax	$0.18	$0.09	$0.09	$0.35	$0.12
Wire	*Individual Income Tax*	$0.12	$0.08	$0.07	$0.27	$0.09
	Corporate Income Tax	$0.09	$0.04	$0.04	$0.17	$0.06
Converter Installation	*Individual Income Tax*	$0.55	$0.21	$0.26	$1.02	$0.34
	Corporate Income Tax	$0.06	$0.08	$0.15	$0.29	$0.10
Line Construction	*Individual Income Tax*	$0.96	$0.36	$0.46	$1.78	$0.59
	Corporate Income Tax	$0.10	$0.13	$0.26	$0.50	$0.17
Right of Way	*Individual Income Tax*	$0.02	$0.02	$0.01	$0.06	$0.02
	Corporate Income Tax	$0.11	$0.02	$0.01	$0.13	$0.04
Totals	*Individual Income Tax*	$1.93	$0.85	$0.97	$3.75	$1.25
	Corporate Income Tax	$0.54	$0.36	$0.54	$1.44	$0.48

1. All impacts are in millions of 2010 $ and are rounded.
2. Assumes a three-year construction period

Operations and Maintenance

As we discussed in Section III, once the transmission line is built and is in operation, O&M costs will contribute $9.4 million of additional spending to the Iowa economy each year. The corresponding amount for Illinois is $5.6 million. The estimated tax-related impacts of annual O&M expenditures in each state are summarized in Tables 37 and 38.

Iowa

According to the information in Table 37, in Iowa, individual income tax revenues and corporate income taxes are predicted to amount to $110 thousand per year and $10 thousand per year, respectively.

Table 37: Estimated Fiscal Impacts of Rock Island Clean Line O&M Expenditures in Iowa

Impact[1]	*Direct*	*Indirect*	*Induced*	*Total*
Individual Income Tax	$0.07	$0.02	$0.02	$0.11
Corporate Income Tax	$0.00	$0.00	$0.00	$0.01

1. All impacts are in millions of 2010 $ and are rounded.

Illinois

According to the information in Table 38, in Illinois, individual income tax revenues and corporate income taxes would amount to $70 thousand per year and $20 thousand per year, respectively.

Table 38: Estimated Fiscal Impacts of Rock Island Clean Line O&M Expenditures in Illinois

Impact[1]	*Direct*	*Indirect*	*Induced*	*Total*
Individual Income Tax	$0.04	$0.01	$0.02	$0.07
Corporate Income Tax	$0.01	$0.00	$0.01	$0.02

1. All impacts are in millions of 2010 $ and are rounded.

VI. Summary of Economic Impacts

The construction of the proposed Rock Island Clean Line has the potential to yield substantial economic impacts in Iowa, Illinois, and the nation as a whole over the projected three-year construction period. Referring to Table 39, construction of the line could potentially increase employment by approximately 2,700 jobs in Iowa and 1,450 jobs in Illinois in each year of the three-year construction period. Labor income would increase $120 million per year in Iowa and $87 million per year in Illinois during the same time frame.

Table 39: Estimated State-Level Construction - Related Impacts of the Rock Island Clean Line in Iowa, Illinois, and the U.S.

	Iowa	*Illinois*	*U.S.*
Impact	*Annual Average*	*Annual Average*	*Annual Average*
Change in Final Demand	$259.2	$132.5	$391.7
Employment	2,718	1,451	6,258
Labor Income	$120.0	$86.8	$339.5
Output	$394.2	$256.3	$1,150.5

Once completed, operation and maintenance of the line would continue to yield economic benefits to each state. Referring to Table 40, potential annual impacts in Iowa include 143 jobs and $6 million in labor income, while Illinois could see an additional 80 jobs and $4.6 million of labor income each year.

Table 40: Estimated Annual O&M-Related Impacts of the Rock Island Clean Line in Iowa and Illinois and the U.S.

	Iowa	*Illinois*	*US*
Employment	143	80	295
Labor Income	$6.1	$4.6	$15.3
Output	$15.3	$11.3	$43.2

Tables 41 and 42 summarize specific fiscal impacts attributable to construction and operation and maintenance of the transmission line. Referring to Table 41, tax revenues from the sources listed there could amount to $2.5 million in Iowa and $1.7 million in Illinois in each year of the three-year period.

Table 41: Estimated Fiscal Impacts of Construction of the Rock Island Clean Line in Iowa and Illinois

	Iowa	*Illinois*
Impact	*Annual Average*	*Annual Average*
Individual Income Tax	$2.17	$1.25
Corporate Income Tax	$0.34	$0.48

Finally, as shown in Table 42, annual tax revenues from the sources listed there resulting from operation and maintenance of the line could amount to $120 thousand in Iowa and $90 thousand in Illinois.

Table 42: Estimated Annual Fiscal Impacts of Rock Island Clean Line-Related O&M Expenditures in Iowa and Illinois

Impact	*Iowa*	*Illinois*
Individual Income Tax	$0.11	$0.07
Corporate Income Tax	$0.01	$0.02

The construction of additional wind farms which the proposed transmission line is expected to stimulate has the potential to result in significant economic impacts as well. Table 43 summarizes the estimated total economic impact during the construction period in Iowa under the 15%, 30%, and 45% scenarios. The potential total employment impacts during construction range from 14,354 to 21,576 jobs, with output expanding by $2.1 billion to $3.8 billion under the 15% and 45% scenarios, respectively. We also estimate that during operations, the wind farms built in Iowa would result in 410 jobs, $17 million in earnings, and $52 million in output annually.

Table 43: Iowa Wind Farms Economic Impacts

Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
Total Construction Impacts 15% Scenario	14,354	$654	$2,126
Total Construction Impacts 30% Scenario	17,965	$845	$2,965
Total Construction Impacts 45% Scenario	21,576	$1,034	$3,804
Total Operating Year Impacts – All Scenarios	410	$17	$52

While Illinois would experience smaller overall impacts than Iowa because it is assumed no new wind farms would be built in the state as a result of the new transmission line, substantial economic benefits would still accrue to Illinois. As shown in Table 44, the Illinois employment impacts of supply chain effects during construction would range from approximately 2,800 to 8,400 jobs, while output would increase from $678 million to $2 billion depending on the scenario.

Table 44: Illinois Wind Farms Economic Impacts

Total Construction Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
15% Scenario	2,798	$190	$678
30% Scenario	5,596	$380	$1,355
45 % Scenario	8,394	$570	$2,033

Finally, the economic impacts of the wind farms on the United States as a whole are summarized in Table 45. Construction of the wind farms could result in 76,000 jobs, $4.4 billion in earnings, and $14.9 billion in output. Operation of the new wind farms could generate approximately 3,980 jobs, $212 million in earnings, and $1.1 billion in output annually.

Table 45 : National Economic Impacts of Wind Farm construction and Operation

Total Impacts	*Jobs*	*Earnings ($ millions)*	*Output ($ millions)*
Construction Impacts	76,041	$4,398	$14,892
Annual Operating Impacts	3,980	$212	$1,111

APPENDIX

Qualifications

Dr. David G. Loomis

Dr. David G. Loomis is Professor of Economics at Illinois State University where he teaches in the Master's Degree program in electricity, natural gas and telecommunications economics. He is Director of the Center for Renewable Energy and Executive Director of the Institute for Regulatory Policy Studies. As part of his duties, he leads the Illinois Wind Working Group under the U.S. Department of Energy. Dr. Loomis is part of a team of faculty that has designed a new undergraduate curriculum in renewable energy at Illinois State University. Dr. Loomis earned his Ph.D. in economics at Temple University.

Dr. Loomis co-authored several industry reports relevant to this proposal, including *The Economic Impact of Wind Energy in Illinois* (co-authored with Jennifer Hinman, 2009 and 2010) and *The Economic Impact of the Wind Turbine Supply Chain in Illinois* (co-authored with J. Lon Carlson and James E. Payne, 2010).

Prior to joining the faculty at Illinois State University, Dr. Loomis worked at Bell Atlantic (Verizon) for 11 years. He has published articles in the *Energy Policy, Electricity Journal, Review of Industrial Organization, Utilities Policy, Information Economics and Policy, International Journal of Forecasting, International Journal of Business Research, Business Economics* and the *Journal of Economics Education*.

Dr. J. Lon Carlson

Dr. J. Lon Carlson is an independent consultant who recently retired as an Associate Professor in the Department of Economics at Illinois State University and Director of Outreach for the Institute for Regulatory Policy Studies. His research on energy issues and environmental economics has appeared in several outlets, including *The Electricity Journal, Energy Policy, Natural Resources Journal, the Boston College Environmental Affairs Law Review, the Journal of the Air and Waste Management Association, and the Journal of Applied Economics Letters*.

Dr. Carlson has also co-authored several economic impact analyses that utilized the IMPLAN model, including *The Economic Impact of the Wind Turbine Supply Chain in Illinois* (co-authored with David G. Loomis and James E. Payne, 2010) and was a principal author of an Environmental Impact Statement that was completed for Western Area Power Administration by Argonne National Laboratory in 1995. Dr. Carlson has held positions at Argonne National Laboratory and the U.S. General Accountability Office, and has worked as a consultant for a number of government agencies. He received his Ph.D. in Economics from the University of Illinois at Urbana-Champaign in 1984.

Dr. John L. Solow

Dr. Solow is Associate Professor of Economics, for the Tippie College of Business, at The University of Iowa. Professor Solow received the B.A. from Yale University and the M.A. and Ph.D. from Stanford University and joined the Iowa faculty in 1981. He has published articles in the areas of sports economics, industrial organization, and the creative economy, and his research interests include sports economics, antitrust law and economics, and public policy. He has worked at the Federal Energy Administration and the Electric Power Research Institute, served as a consultant to the U.S. Departments of Energy and Justice, Mid-American Energy, Qwest Telecommunications and numerous law firms, and has been a visiting scholar at Stanford University, the University of Auckland in New Zealand, and Monash University in Australia. Professor Solow teaches Principles of Microeconomics, Sports Economics, Antitrust Economics, and Managerial Economics for MBA's, and is currently the Department Executive Officer for the Department of Economics.

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