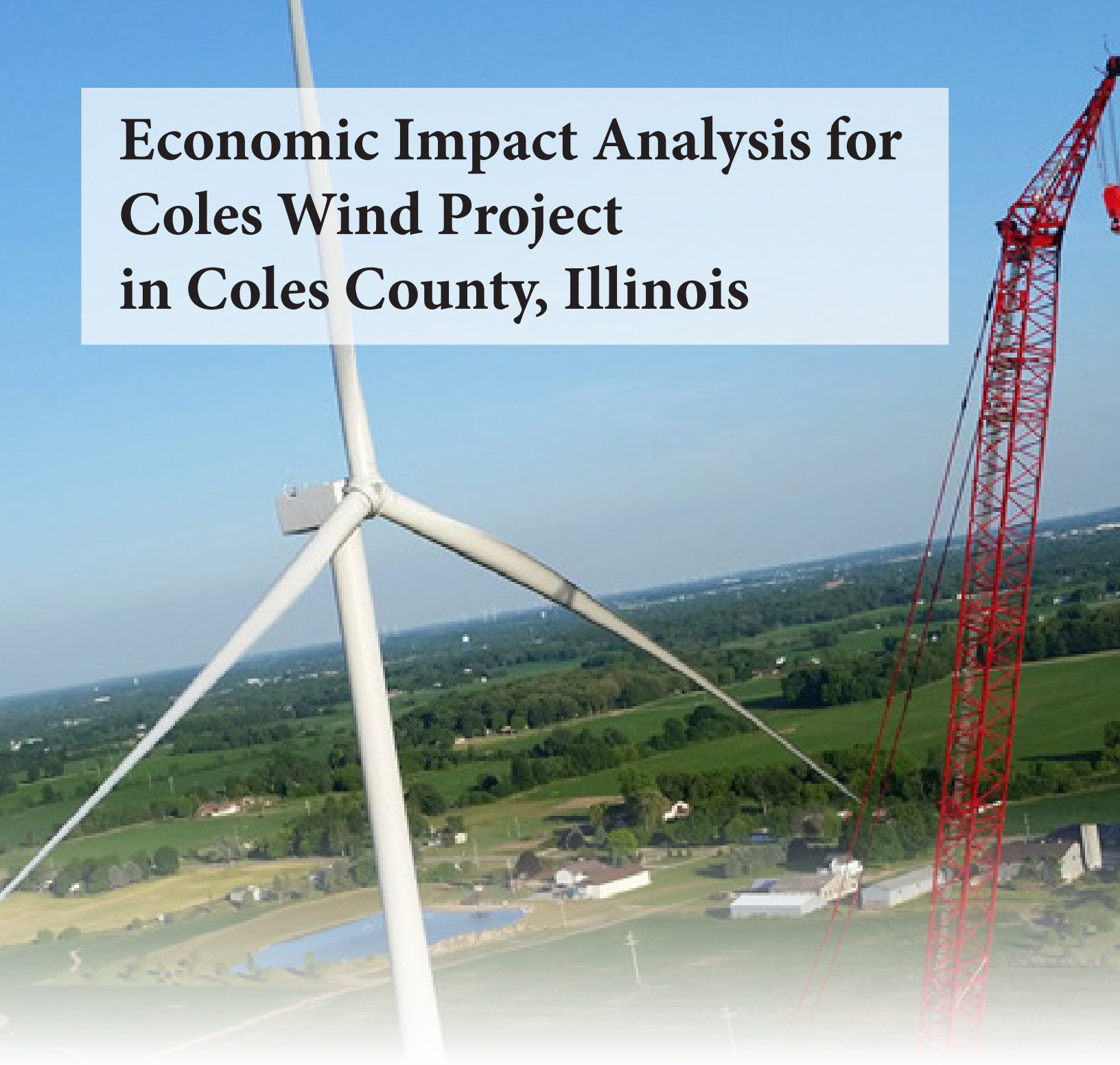
Economic Impact Analysis for Coles Wind Project in Coles County, Illinois



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About the Author

Dr. David G. Loomis is Professor of Economics at Illinois State University and Co-Founder of the Center for Renewable Energy. He has over 10 years of experience in the renewable energy field and has performed economic analyses at the county, region, state and national levels for utility-scale wind and solar generation. He has served as a consultant for Apex Clean Energy, Clean Line Energy Partners, EDF Renewables, E.ON Climate and Renewables, Geronimo Energy, Invenergy, J-Power, the National Renewable Energy Laboratories, Ranger Power, State of Illinois, Tradewind, and others. He has testified on the economic impacts of energy projects before the Illinois Commerce Commission, Missouri Public Service Commission, Illinois Senate Energy and Environment Committee and numerous county boards. Dr. Loomis is a widely recognized expert and has been quoted in the Wall Street Journal, Forbes Magazine, Associated Press, and Chicago Tribune as well as appearing on CNN.

Dr. Loomis has published over 25 peer-reviewed articles in leading energy policy and economics journals. He has raised and managed over $7 million in grants and contracts from government, corporate and foundation sources. He received the 2011 Department of Energy's Midwestern Regional Wind Advocacy Award and the 2006 Best Wind Working Group Award. Dr. Loomis received his Ph.D. in economics from Temple University in 1995.

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Table of Contents

Figures:

Tables:

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I. Executive Summary

Apex Clean Energy is developing the Coles Wind Project in Coles County, Illinois. The purpose of this report is to evaluate the economic impact of this Project on Coles County and the State of Illinois. The basis of this analysis is to study the direct, indirect and induced impacts on job creation, wages, and total economic output.

The Project consists of an estimated 300 megawatts ("MW") of capacity of wind turbines and the associated access roads, transmission and communication equipment, storage areas, and control facilities (the "Project"). For purposes of this report, a total name plate capacity of 300 MW in Coles County was assumed. The Project represents an investment of over $411 million in Coles County. The total development is anticipated to result in the following:

Economic Impact

Jobs – all jobs numbers are full-time equivalents

- 384 new jobs (120 direct) during construction for Coles County
- 864 (191 direct) new jobs during construction for the State of Illinois
- 39 (12 direct) new long-term jobs for Coles County
- 54 (12 direct) new long-term jobs for the State of Illinois

Earnings

- Over $21.8 million in new earnings during construction for Coles County
- Over $60 million in new earnings during construction for the State of Illinois
- Over $1.8 million in new long-term earnings for Coles County annually
- Over $3.4 million in new long-term earnings for the State of Illinois annually

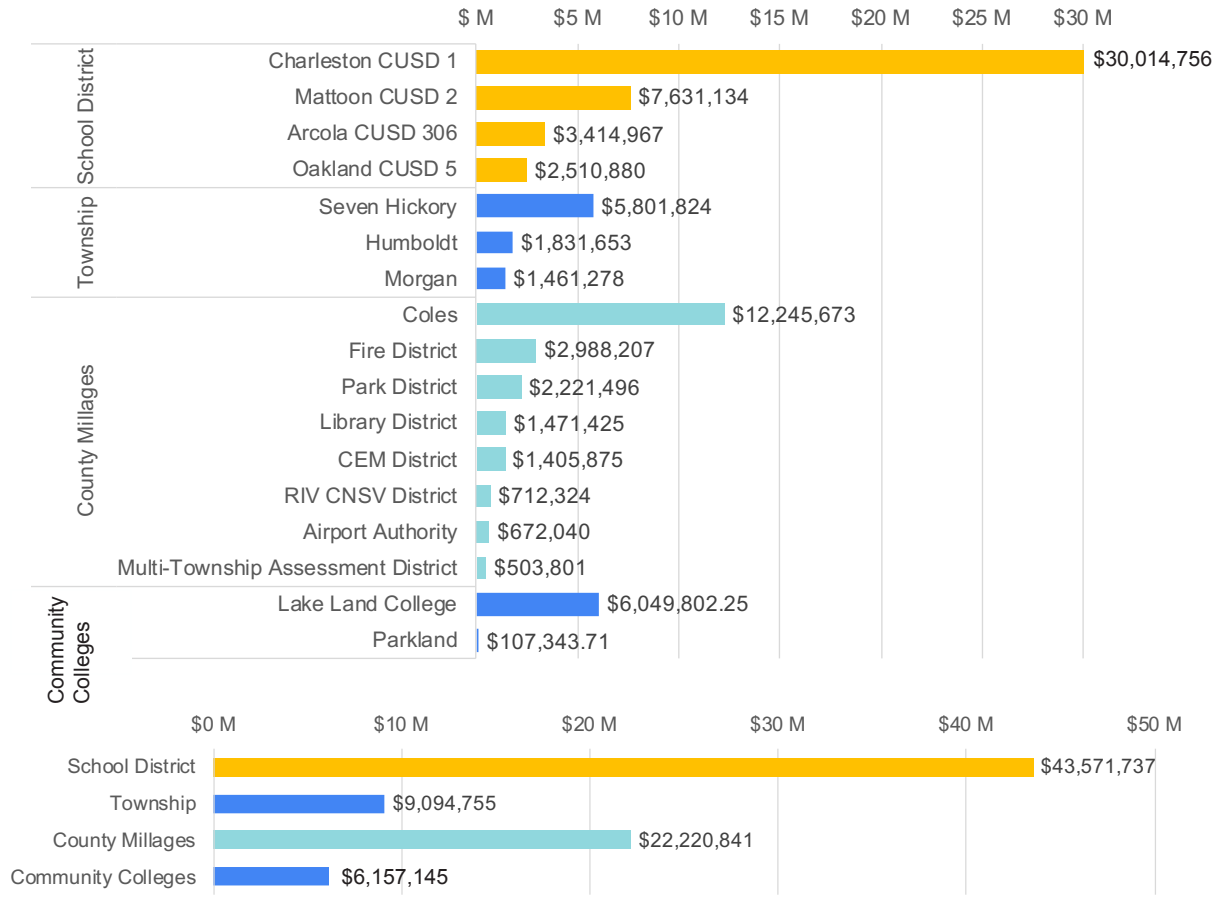
Output – the value of goods and services added to the local economy - includes leases and property taxes

- Over $48.6 million in new output during construction for Coles County
- Over $154.9 million in new output during construction for the State of Illinois
- Over $9.3 million in new long-term output for Coles County annually
- Over $13.3 million for the State of Illinois in new long-term output annually

Property Taxes

- Over $43.5 million in total school district revenue over the life of the Project
- Over $12.2 million in total county property taxes for Coles County over the life of the Project
- Over $81 million in property taxes in total for all taxing districts over the life of the Project

Total Property Taxes Paid By Coles Wind Project



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II. Wind Industry Growth and Economic Development

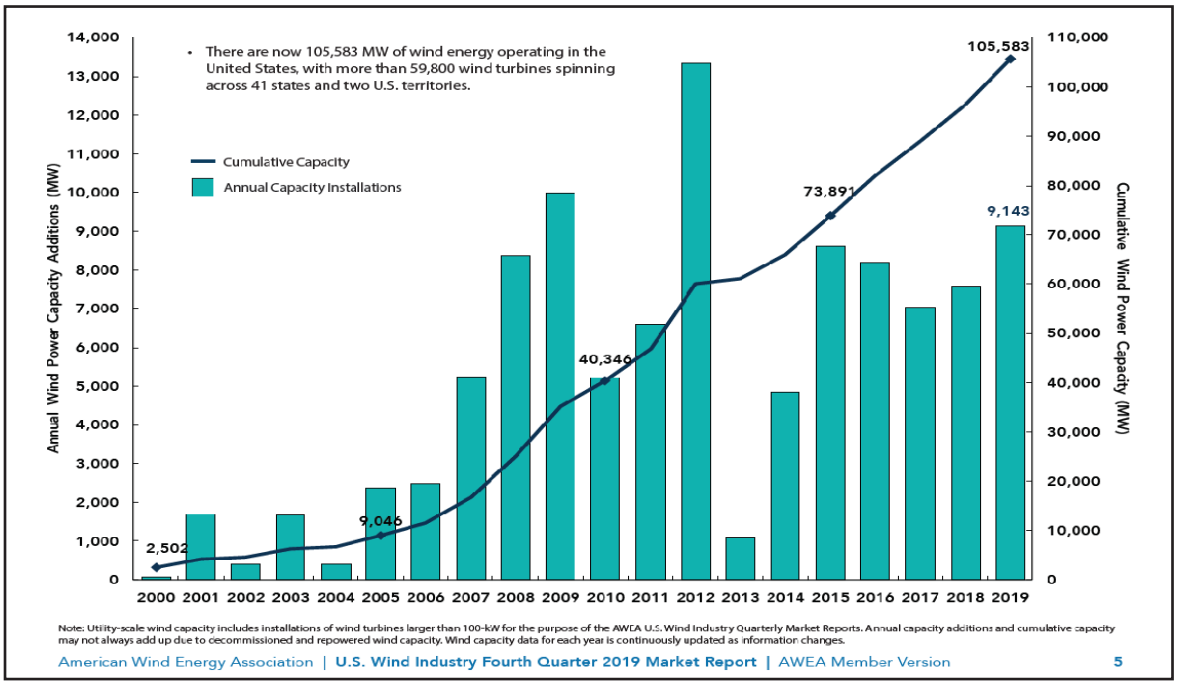
a. United States Wind Industry Growth

The United States wind industry grew at a rapid pace from 2006-2019, pausing only in 2013 due to federal policy uncertainty. In 2012, the U.S. set a new record of 13,131 MW far surpassing the previous annual peak just over 10,000 MW of wind power installed in 2009 (American Wind Energy Association, 2019). The industry rebounded with steady growth of 8,115 MW installed in 2015; 8,203 MW in 2016; 7,017 MW in 2017; 7,588 MW in 2018; and 9,143 MW in 2019 (AWEA, 2020).

The total amount of wind capacity in the U.S. by the end of 2019 was 105,583 MW, which is enough to power the equivalent of over 32 million homes (AWEA, 2020). China is the global leader with 229,564 MW of installed capacity, with Germany in third place with 53,913 MW of installed capacity (2019 figures with the United States in second place) (GWEC, 2020). Figure 1 shows the growth in installed annual capacity and cumulative capacity in the U.S. and Figure 2 shows the state-by-state breakdown of installed capacity.

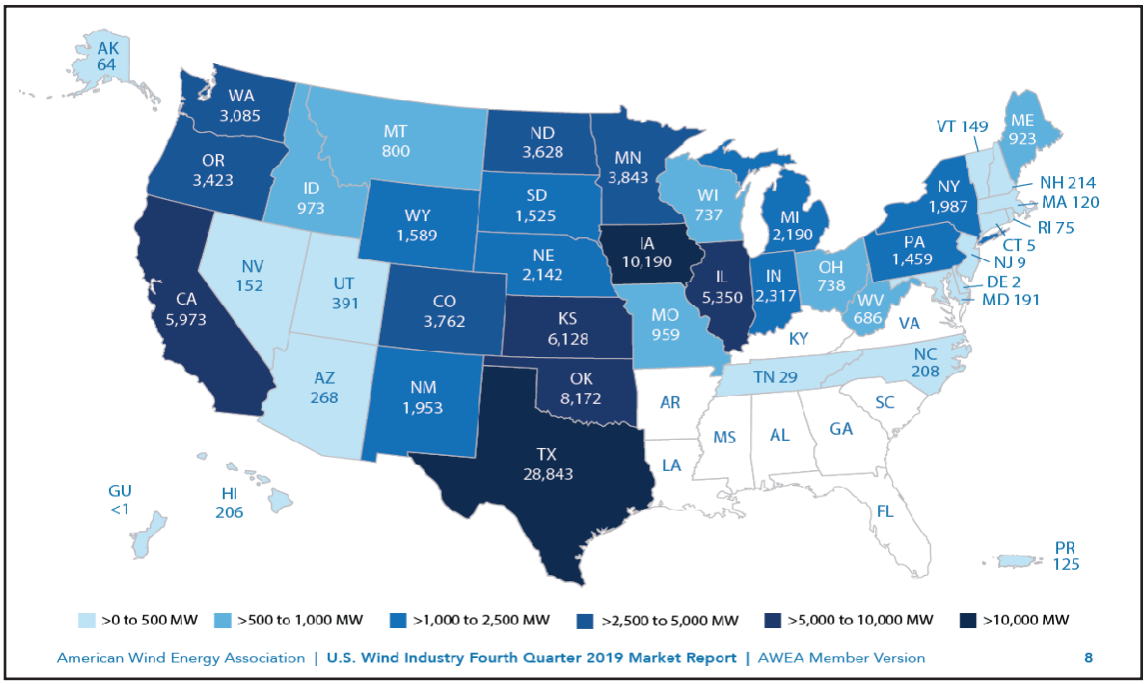
Several factors have spurred the continued growth of wind energy in recent years. First, new technology and rigorous competition among turbine manufacturers lowered the cost of wind turbines. Second, larger capacity wind turbines and higher hub heights produced more output and lowered the cost of wind energy production. Third, several large corporate buyers increased the demand for wind energy beyond the traditional electric utility market. Finally, the current phase-out of the Production Tax Credit (which provides a per-kWh tax credit) incentivized wind developers to develop projects as quickly as possible to receive the maximum tax credit.

Figure 1.—United States Annual and Cumulative Wind Power Capacity Growth



Source: American Wind Energy Association, U.S. Wind Industry 4Q2019 Market Report

Figure 2.—Total Wind Capacity by State



Source: American Wind Energy Association, U.S. Wind Industry 4Q2019 Market Report

b. Illinois Wind Industry Growth

Illinois' wind power capacity has grown from 50 MW in 2003 to 5,659 MW by the end of the first quarter of 2020 (AWEA, 2020). As of March, 2020, Illinois ranked 6th in the United States in existing wind-powered generating capacity and ranked 16th in the United States in potential capacity (AWEA, 2010b; AWEA, 2020). Table 1 has a list of the operational wind farms in Illinois. Illinois has 32 wind farms greater than 50 MW covering parts of 20 different counties.

Figure 3 shows the installed wind energy capacity additions by year from 2003 to present. No wind farms were completed in 2013 and 2014. Five wind farms are currently under construction: Blooming Grove (250 MW) in McLean County; Broadlands (199.8 MW) in Douglas County; Lone Tree (79.4 MW) in Bureau County and Sugar Creek (202 MW) in Logan County. In total, over 730 MW of wind capacity will be added once these projects are completed.

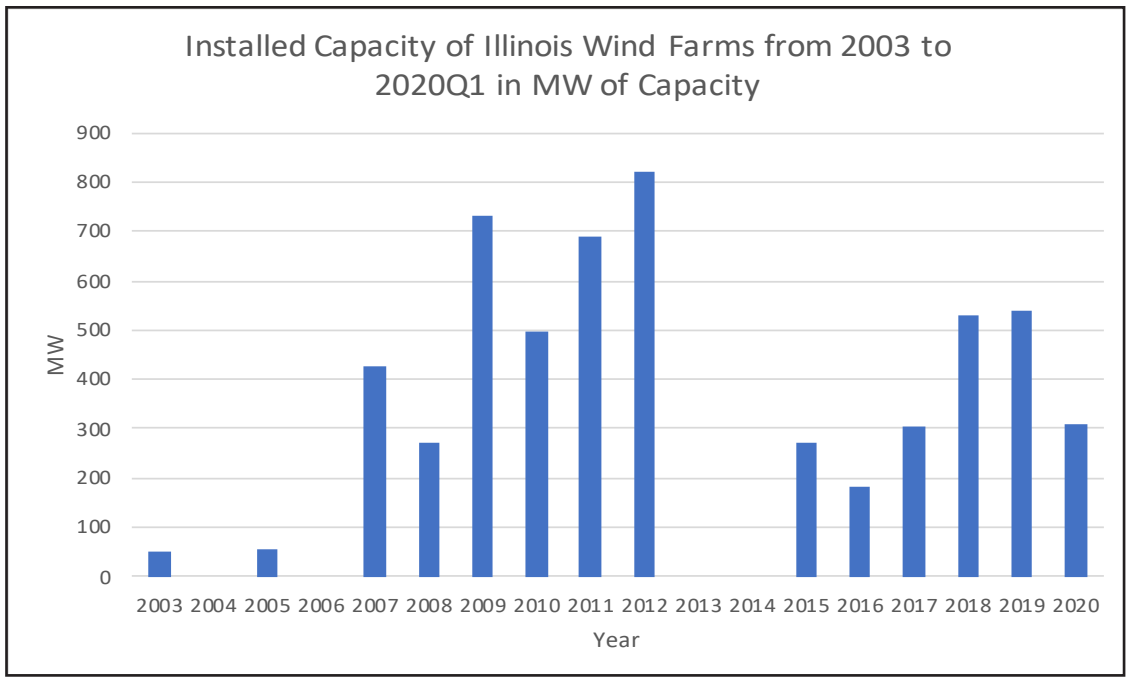
According to Figure 4, employment is the highest in the wind energy industry (8,763) in Illinois, larger than solar electric generation (5,917) and natural gas generation (4,613).

Table 1. — Illinois Operating Wind Projects Greater Than 50 MW in Capacity

Wind Farm	Location (County)	Capacity (MW)
Radford's Run	Macon	305.8
Streator Cayuga Ridge South Wind Farm	Livingston	300.0
Big Sky Wind Farm	Bureau and Lee	239.4
Lee-DeKalb Wind Energy Center	DeKalb and Lee	217.5
California Ridge	Champaign and Vermillion	214.0
Walnut Ridge	Bureau	212.0
Bishop Hill I	Henry	209.4
Bright Stalk Wind Farm	McLean	205.2
Minonk Wind Farm	Woodford	200.0
Top Crop Wind Farm Phase II	Grundy	198.0
Twin Groves Wind Farm Phase I	McLean	198.0
Twin Groves Wind Farm Phase II	McLean	198.0
Green River	Lee	194.25
Hill Topper	Logan	185.0
Kelly Creek Wind Farm	Ford and Kankakee	184.0
Pilot Hill	Iroquois and Kankakee	175.1
Otter Creek	LaSalle	158.2
Pioneer Trail	Iroquois and Ford	150.0
Settlers Trail	Iroquois	150.0
Camp Grove Wind Farm	Marshall and Stark	150.0
White Oak Energy Center	McLean	150.0
Cardinal Point	McDonough	150.0
Bishop Hill III	Henry	132.0
Grand Ridge Energy Center Expansion	LaSalle	111.0
Shady Oaks	Lee	109.5
Top Crop Wind Farm Phase I	LaSalle	102.0
EcoGrove Wind Farm	Stephenson	100.5
Railsplitter Wind Farm	Logan and Tazewell	100.5
Grand Ridge Energy Center Phase I	LaSalle	99.0
Hoopeston Wind	Vermillion	98.0
Bishop Hill II	Henry	80.0
GSG Wind Farm	Lee and LaSalle	80.0
Mendota Hills Repowered	Lee	76.125
Providence Heights Wind Farm	Bureau	72.0
Whitney Hill	Logan	65.28
Crescent Ridge Wind Farm	Bureau	54.4
Mendota Hills (Decommissioned)	Lee	51.7

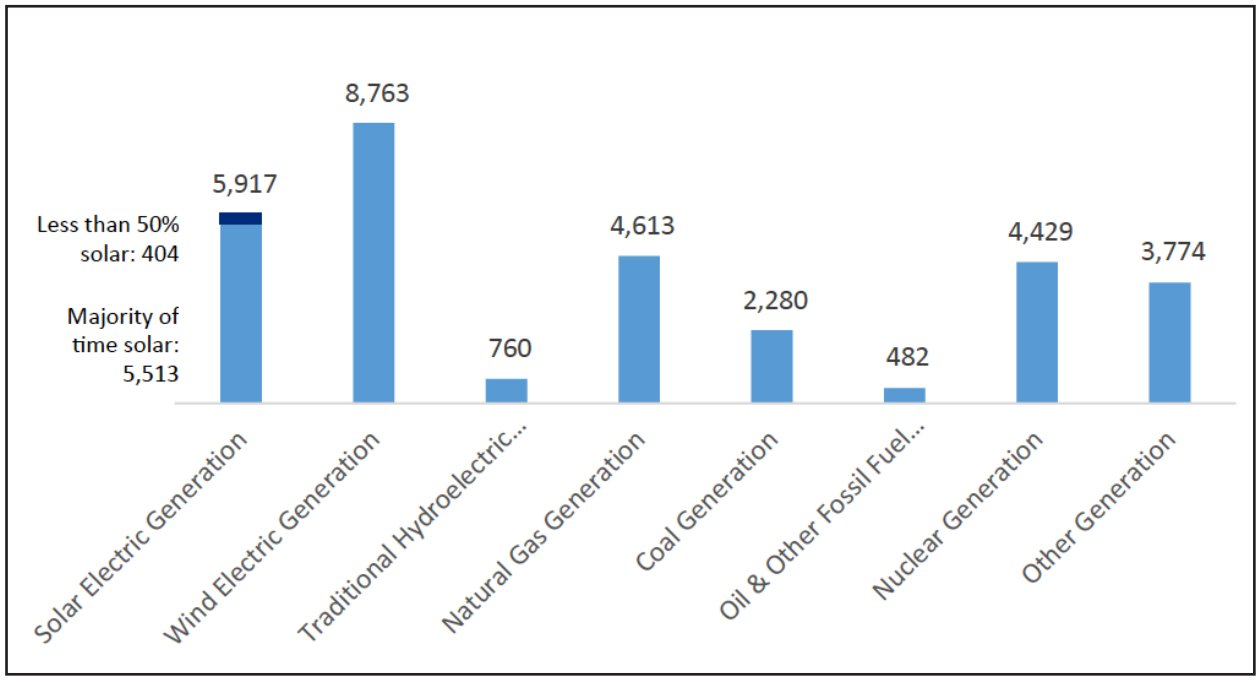
Source: Center for Renewable Energy and America Wind Energy Association

Figure 3. — Illinois Installed Wind Energy Capacity from 2003 to 2020



Source: Center for Renewable Energy and America Wind Energy

Figure 4. — Electric Generation Employment By Technology



Source: U.S. Energy and Employment Report 2020: Illinois

c. Economic Benefits of Wind Farms

Wind farms create numerous economic benefits that continue to last for decades. Wind farms create job opportunities in the local area during both the short-term construction phase and the long-term operational phase. Short-term construction jobs include both workers at the wind farm site and jobs created along the supply chain. Long-term operational jobs include wind turbine technicians, supervisors and supply chain jobs.

Wind developers typically lease the land for the turbines from local landowners without materially affecting ongoing agricultural uses. Only a small portion of the total project footprint is used for the turbines, access roads, feeder lines and substations. For most wind projects, it is anticipated that approximately 1-2% of the total leased land will actually contain facilities. Each turbine and the associated access road will use approximately half an acre to one acre of farmland. Lease payments made to landowners provide a reliable source of long-term income to offset the fluctuating prices received from crops or the impact of weather events on production. Landowners then have additional funds to make purchases in the local economy and elsewhere.

Wind projects enhance the equalized assessed value of property within the county. Typically, wind developers pay taxes based on that improved value unless preempted by law or mutual agreement. Wind farms strengthen the local tax base helping to improve county services, schools, police and fire departments and infrastructure improvements, such as public roads.

Numerous studies have quantified the economic benefits across the United States. The National Renewable Energy Laboratory has produced economic impact reports for the State of Arizona (NREL, 2008a), State of Idaho (NREL, 2008b), State of Indiana (NREL, 2014), State of Iowa (NREL, 2013), State of Maine (NREL, 2008c), State of Montana (NREL, 2008d), State of New Mexico (NREL, 2008e), State of Nevada (NREL, 2008f), State of Pennsylvania (NREL, 2008g), State of South Dakota (NREL, 2008h), State of Utah (NREL 2008i), State of West Virginia (NREL, 2008j), State of Wisconsin (NREL, 2008k), and the State of North Carolina (NREL, 2009).

More locally, the Center for Renewable Energy at Illinois State University recently released a report examining the economic impact of Illinois wind farms and the economic impact of the related wind turbine supply chain in Illinois (see https://renewableenergy.illinoisstate.edu/wind/pubs.php). According to the Economic Impact: Wind Energy Development in Illinois (June 2016), "the 25 largest wind farms in Illinois:

- Created approximately 20,173 full-time equivalent jobs during construction periods
- Support approximately 869 permanent jobs in rural Illinois areas
- Support local economies by generating $30.4 million in annual property taxes
- Generate $13.86 million annually in extra income for Illinois landowners who lease their land to the wind farm developer
- Will generate a total economic benefit of $6.4 billion over the life of the projects."

III. Project Description and Location

a. Coles Wind Project Description

Coles Wind, LLC ("Coles Wind" or the "Project"), is an approximated 300 MW wind project located in Coles County, Illinois, north of the locality of Charleston. The Project is anticipated to enter operation by Q4 2025. Project highlights include the following:

The Coles Wind Project boasts an excellent wind resource for central Illinois and will contribute substantially to the clean energy future of Illinois given the wind resources available at the site and the use of the latest wind turbine technology.

In structuring this wind energy project, we have relied upon Apex's extensive experience developing and constructing similarly sized projects.

The final model turbine has yet to be selected however, the Project will utilize potentially up to 70 modern wind turbines.

The turbine layout is targeted to encompass approximately 30,000 acres of land.

b. Coles County, Illinois

Coles County is located in the Eastern part of Illinois (see Figure 5). It has a total area of 510 square miles and the U.S. Census estimates that the 2010 population was 53,873 with 23,425 housing units. The county has a population density of 106 (persons per square mile) compared to 232 for the State of Illinois. Median household income in the county was $36,457.

Figure 5. — Location of Coles County, Illinois

https://en.wikipedia.org/wiki/Coles_County,_Illinois#/media/File:Map_of_Illinois_highlighting_Coles_County.svg

As shown in Table 2, the largest industry is "Administrative Government" followed by "Health Care and Social Assistance," "Administrative Services" and "Retail Trade." These data for Table 2 come from IMPLAN covering the year 2018 (the latest year available).

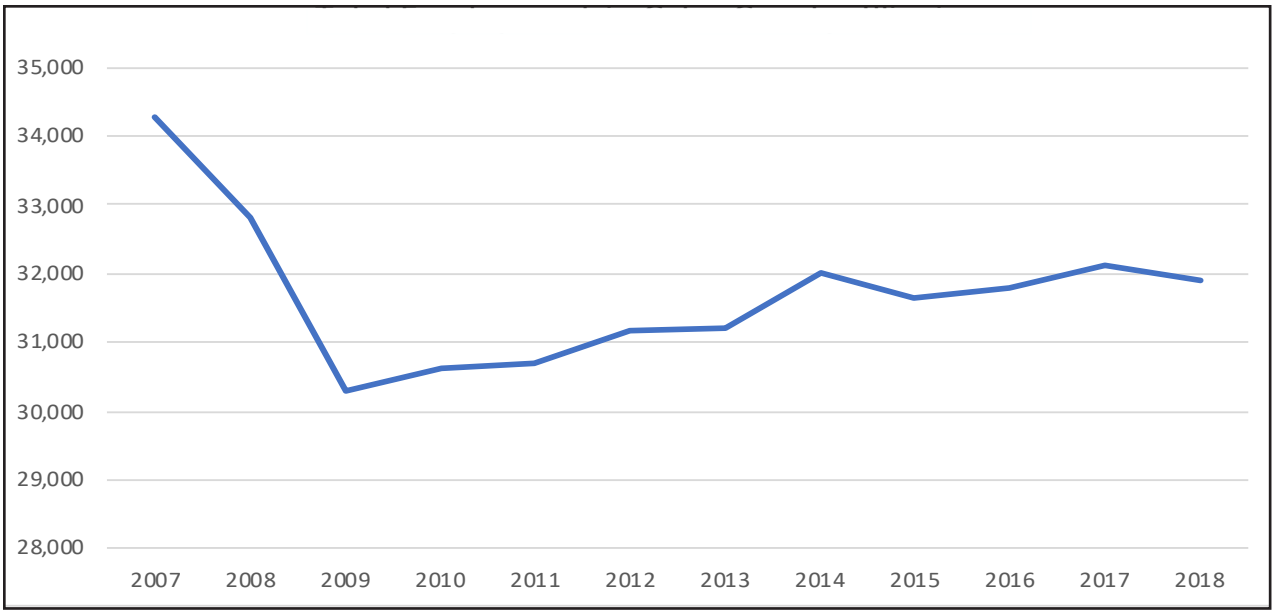
Table 2. — Employment by Industry in Coles County

Industry	Number	Percent
Administrative Government	4,872	15.0%
Health Care and Social Assistance	4,734	14.6%
Administrative and Support and Waste Management and Remediation Services	3,302	10.2%
Retail Trade	2,685	8.3%
Manufacturing	2,494	7.7%
Accommodation and Food Services	2,386	7.3%
Professional, Scientific, and Technical Services	2,256	6.9%
Other Services (except Public Administration)	2,152	6.6%
Construction	1,377	4.2%
Real Estate and Rental and Leasing	1,232	3.8%
Finance and Insurance	1,060	3.3%
Management of Companies and Enterprises	681	2.1%
Agriculture, Forestry, Fishing and Hunting	627	1.9%
Wholesale Trade	602	1.9%
Information	515	1.6%
Transportation and Warehousing	513	1.6%
Arts, Entertainment, and Recreation	307	0.9%
Government Enterprises	270	0.8%
Utilities	174	0.5%
Educational Services	157	0.5%
Mining, Quarrying, and Oil and Gas Extraction	95	0.3%

Source: Impact Analysis for Planning (IMPLAN), County Employment by Industry

Table 2 provides the most recent snapshot of total employment but does not examine the historical trends within the county. Figure 6 shows employment from 2007 to 2018. Total employment in Coles County was at its highest at 34,280 in 2007 and its lowest at 30,283 in 2009. Since then, employment has been increasing steadily.

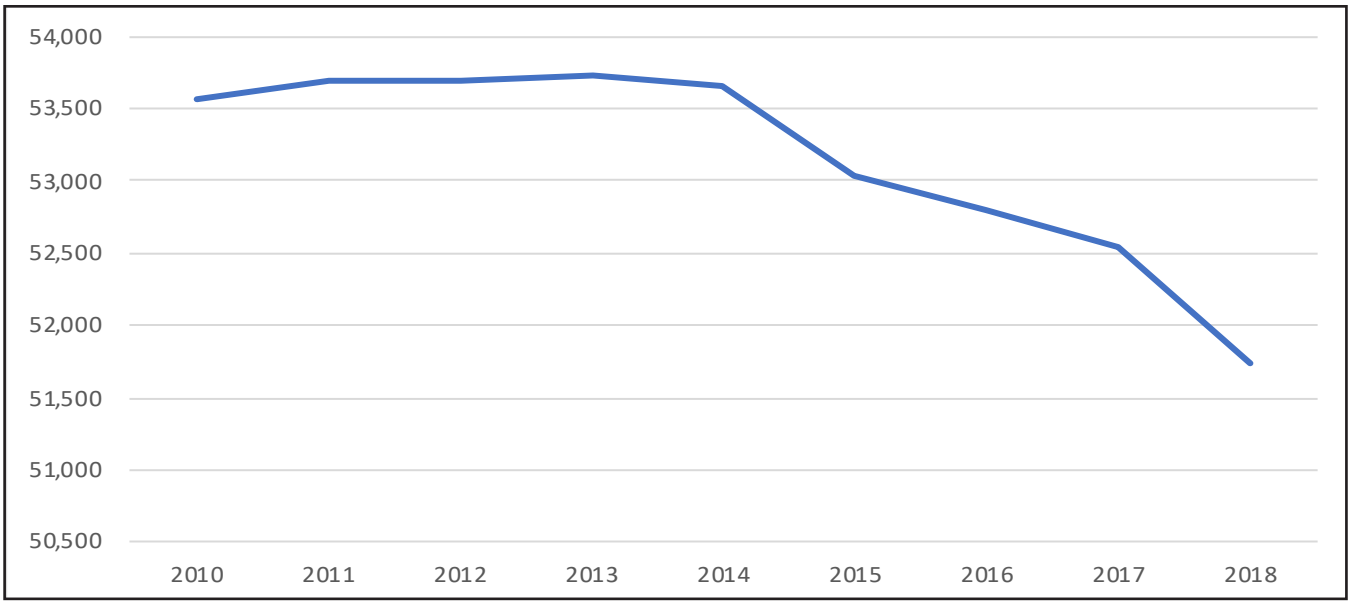
Figure 6. — Total Employment in Coles County from 2007 to 2018



Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income

Unlike the quickly changing level of employment, the overall population in the county has been decreasing steadily, as shown in Figure 7. Coles County population was 53,568 in 2010 and 51,736 in 2018, a loss of 1,832. The average annual population decrease over this time period was 229.

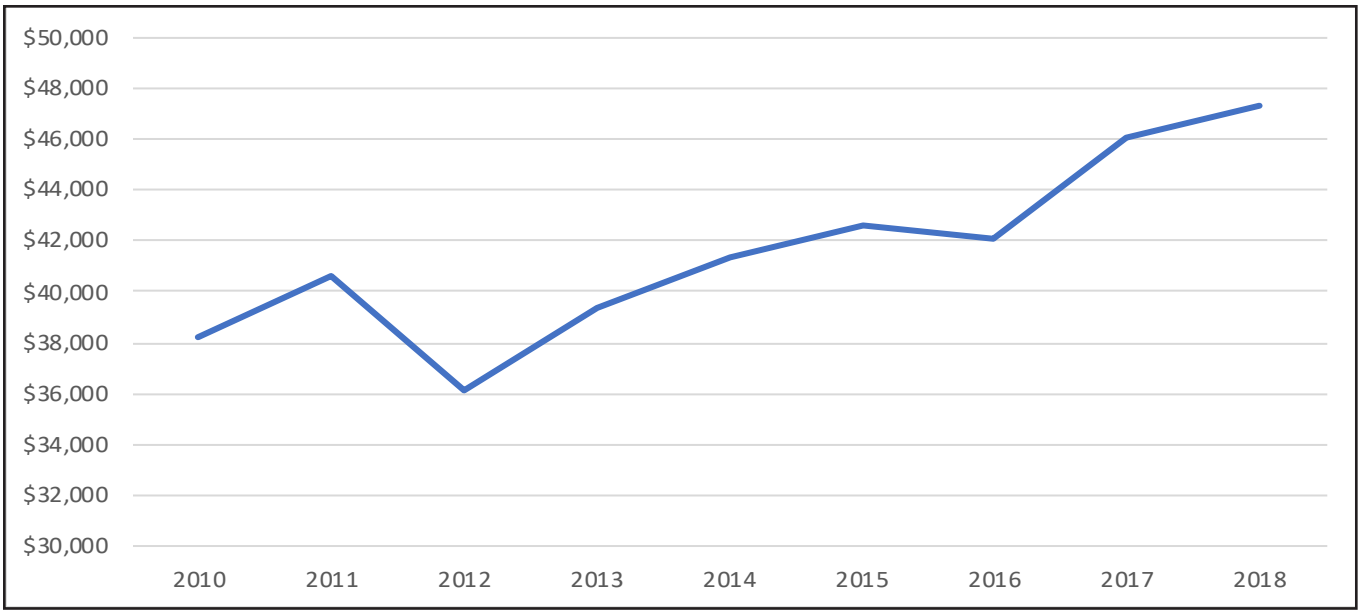
Figure 7. — Population in Coles County 2010-2018



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Population

Unlike the population trends, household income has been trending upward in Coles County. Figure 8 shows the median household income in Coles County from 2010 to 2018. Household income was at its lowest at $36,093 in 2012 and its highest at $47,291 in 2018.

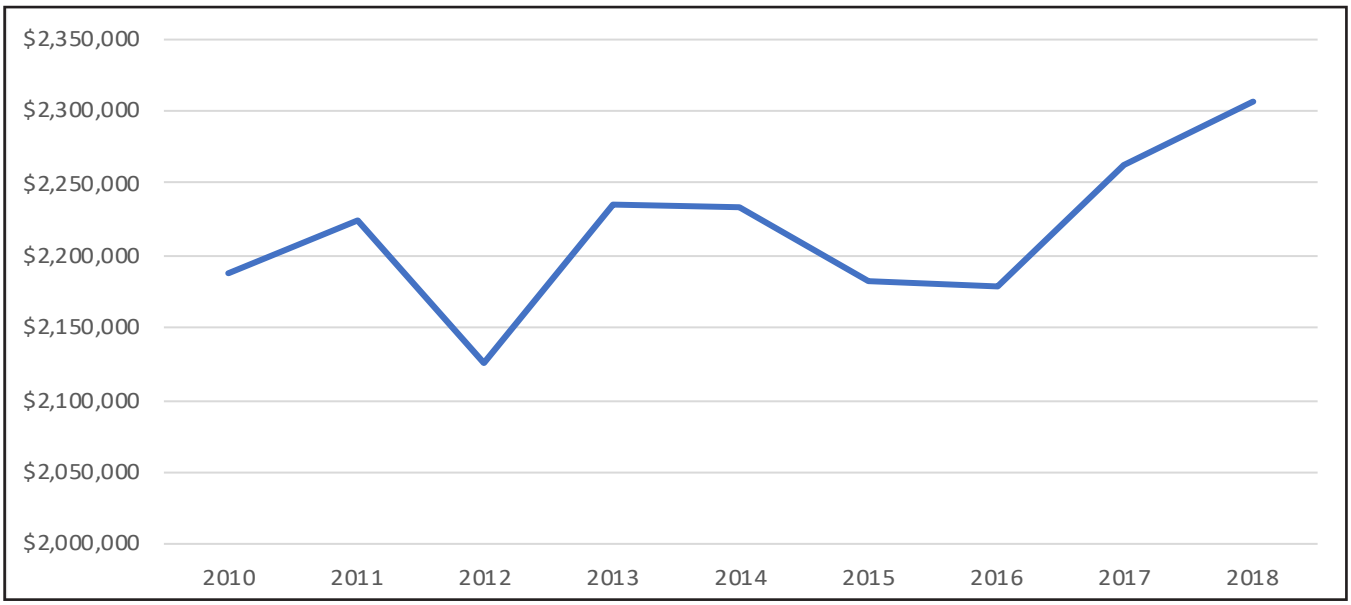
Figure 8. — Median Household Income in Coles County from 2010 to 2018



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Median Household Income

Real Gross Domestic Product (GDP) is a measure of the value of goods and services produced in an area and adjusted for inflation over time. The Real GDP for Coles County has been fluctuating since 2010, as shown in Figure 9.

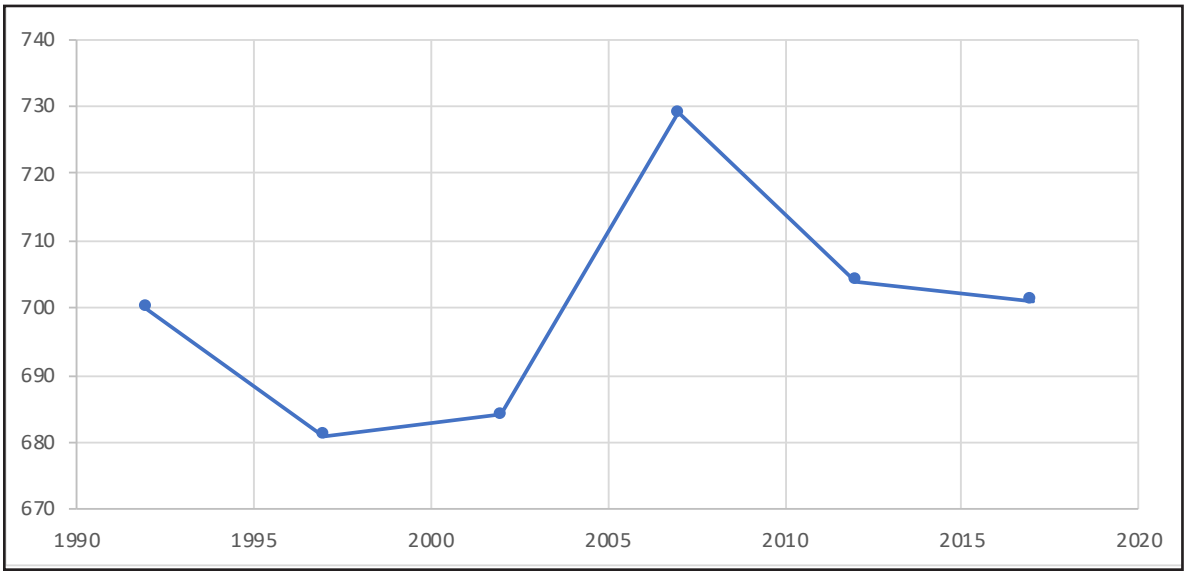
Figure 9. — Real Gross Domestic Product (GDP) in Coles County from 2010-2018



Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income

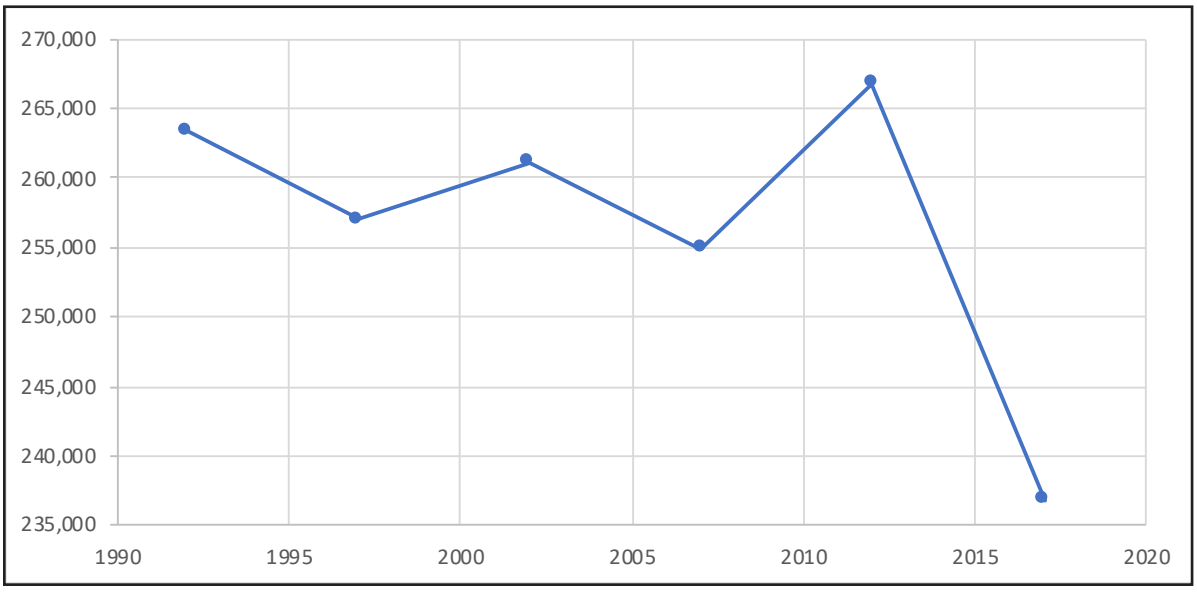
The farming industry has been declining in Coles County. As shown in Figure 10, the number of farms has fluctuated very little, going from 700 in 1992 to 701 in 2017. However, the amount of land in farms has decreased drastically in recent years. The county farmland hit a high of 266,773 acres in 2012 and a low of 236,864 acres in 2017 according to Figure 11.

Figure 10. — Number of Farms in Coles County from 1992 to 2017



Source: Census of Agriculture, 1992-2017

Figure 11. — Land in Farms in Coles County from 1992 to 2017



Source: Census of Agriculture, 1992-2017

IV. Economic Impact Methodology

NREL: National Renewable Energy Laboratory

JEDI: Jobs and Economic Development Impacts

IMPLAN: IMpact Analysis for PLANning

The economic analysis of wind power development presented here utilizes the National Renewable Energy Laboratory's (NREL's) latest Jobs and Economic Development Impacts (JEDI) Wind Energy Model (W6-28-19). NREL is the U.S. Department of Energy's primary national laboratory for renewable energy and energy efficiency research and development. 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. Essentially, JEDI is an input-output model, which takes into account the fact that the output of one industry can be used as an input for another. For example, when a wind farm developer purchases turbines to build a wind farm, those wind turbines are made of components such as fiberglass, aluminum, steel, copper, etc. Therefore, purchases of wind turbines impact the demand for these components. In addition, when a wind farm developer purchases a wind turbine from a manufacturing facility, the manufacturer uses some of that money to pay employees, and then the employees spend that money to purchase goods and services within their community. In essence, JEDI reveals how purchases of wind project materials not only benefit turbine manufacturers but also the local industries that supply the concrete, rebar, and other materials (Reategui et al., 2009). 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, turbine and supply chain (indirect), and induced impacts.

The JEDI Model was developed in 2002 to demonstrate the economic benefits associated with developing wind farms in the United States. The model was developed by Marshall Goldberg of MRG & Associates, under contract with the National Renewable Energy Laboratory. The JEDI model utilizes state specific industry multipliers obtained from IMPLAN (IMpact Analysis for PLANning). IMPLAN software and data are managed and updated by the Minnesota IMPLAN Group, Inc., using data collected at federal, state, and local levels. The JEDI model considers 14 aggregated industries that are impacted by the construction and operation of a wind farm: agriculture, construction, electrical equipment, fabricated metals, finance/insurance/real estate, government, machinery, mining, other manufacturing, other services, professional service, retail trade, transportation/communication/public utilities, and wholesale trade (Reategui et al., 2009). This study does not analyze net jobs. It analyzes the gross jobs that the new wind farm development supports.

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. Final demands are goods and services purchased for their ultimate use by the end user. Onsite construction-related services include engineering, design, and other professional services.

Direct impacts during operating years refer to the final demand changes that occur in the onsite spending for wind farm workers. Direct jobs consist primarily of onsite construction and project development labor.

The initial spending on the construction and operation of the wind farm creates a second layer of impacts, referred to as "turbine and supply chain impacts" or "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. Essentially, these impacts result from "spending related to project development and on-site labor such as equipment costs (turbines, blades, towers, transportation), manufacturing of components and supply chain inputs, materials (transformer, electrical, HV line extension, HV substation and interconnection materials), and the supply chain of inputs required to produce these materials" (JEDI Support Team, 2009, 2). Concrete that is used in turbine foundations increases the demand for gravel, sand, and cement. As a result of the expenditure for concrete, there is increased economic activity at quarries and cement factories and these changes are indirect impacts. The accountant for the construction firm and the banker who finances the contractor are both considered indirect impacts. All supply chain component impacts/manufacturing-related activities are included under indirect impacts; therefore, the late stage turbine assembly process, which includes gearbox assembly, blade production, and steel rolling are all included under the construction period indirect impacts category.

Indirect impacts during operating years refer to the changes in inter-industry purchases resulting from the direct final demand changes. Essentially, these impacts result from "expenditures related to on-site labor, materials, and services needed to operate the wind farms (e.g., vehicles, site maintenance, fees, permits, licenses, utilities, insurance, fuel, tools and supplies, replacement parts/equipment); the supply chain of inputs required to produce these goods and services; and project revenues that flow to the local economy in the form of land lease revenue, property tax revenue, and revenue to equity investors" (JEDI Support Team, 2009, 3). 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 being present (Eric Lantz, February 25, 2009, e-mail message to Jennifer Hinman).

Induced impacts during construction refer to the changes that occur in household spending as household income increases or decreases due to the direct and indirect effects of final demand changes. Local spending by employees working directly or indirectly on the wind farm project who receive their paychecks and then spend money in the community is included. Additional local jobs and economic activity are supported by these purchases of goods and services. Thus, for example, the increased economic activity at quarries and cement factories results in increased revenues for the affected firms and raises individual incomes. Individuals employed by these companies then spend more money in the local economy, e.g., as workers receive income, they may decide to purchase more expensive clothes, or higher quality food along with other goods and services from local businesses. This increased economic activity may result from "construction workers who spend a portion of their income on lodging, groceries, clothing, medicine, a local movie theater, restaurant, or bowling alley;" or a "steel mill worker who provides the inputs for turbine production and spends his money in a similar fashion, thus supporting jobs and economic activities in different sectors of the economy" (JEDI Support Team, 2009, 2).

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. Some examples include a "wind farm technician who spends income from working at the wind farm on buying a car, a house, groceries, gasoline, or movie tickets;" or a "worker at a hardware store who provides spare parts and materials needed at the wind farm and who spends money in a similar fashion, thus supporting jobs and economic activities in different sectors of the economy" (JEDI Support Team, 2009, 3).

This methodology has been validated by a paper in the peer-reviewed economics literature. In the article, "Ex Post Analysis of Economics Impacts from Wind Power Development in U. S. Counties," the authors conduct an ex post econometric analysis of the county-level economic development impacts of wind power installations from 2000 through 2008. They find an aggregate increase in county-level personal income and employment of approximately $11,000 and 0.5 jobs per megawatt of wind power capacity during that time which is consistent with the JEDI results at the county level. (Brown, 2012)

V. Economic Impact Results

The results were derived from project cost estimates supplied by Apex Clean Energy. In addition, Apex Clean Energy helped estimate the percentages of project materials and labor that will be coming from within Coles County and the State of Illinois.

Two separate JEDI models were run to show the economic impact of the Project. The first JEDI model used the 2018 Coles County multipliers from IMPLAN. The second JEDI model used the 2018 State of Illinois multipliers from IMPLAN and the same project costs. Because the multipliers and the local content percentage are different for the two models, the results are independent from one another. However, any local content coming from Coles County is obviously coming from the State of Illinois as well. Similarly, the State of Illinois multipliers will generally be larger than Coles County multipliers but some individual sectors of the economy could be stronger.

The output from these models is shown in Tables 3-5. Table 3 lists the total employment impact from the Project for Coles County and the State of Illinois. Table 4 shows the impact on total earnings and Table 5 contains the impact on total output. The results are divided into one-time construction impacts and ongoing annually recurring operations impacts that are expected to last for the full life of the Project which is estimated to be 25-40 years. Project Development and Onsite Labor Impacts correspond to direct impacts as defined in the methodology section. Turbine and Supply Chain Impacts are the indirect impacts during construction and Local Revenue and Supply Chain Impacts are indirect impacts during operations.

Table 3. — Total Employment Impact from Coles Wind Project

	Coles County	State of Illinois
Construction		
Project Development and Onsite Labor Impacts	120	191
Turbine and Supply Chain Impacts	205	449
Induced Impacts	59	223
New Local Jobs during Construction	384	864
Operations		
Onsite Labor Impacts[1]	12	12
Local Revenue and Supply Chain Impacts	13	15
Induced Impacts	14	27
New Local Long-Term Jobs	39	54

[1] The direct jobs estimate of 12 are based on what the company expects to hire for this project.

The results from the JEDI model show significant employment impacts from the Coles Wind Project. Employment impacts can be broken down into several different components. Direct jobs created during the construction phase typically last anywhere from 6 months to over a year depending on the size of the project; however, the direct job numbers present in Table 3 from the JEDI model are based on a full-time equivalent (FTE) basis for a year. In other words, 1 job = 1 FTE = 2,080 hours worked in a year. A part time or temporary job would constitute only a fraction of a job according to the JEDI model. For example, the JEDI model results show 120 new onsite jobs during construction in Coles County, though the construction of the Project could actually involve hiring closer to 240 workers for 6 months.

As shown in Table 3, new local jobs created or retained during construction total 384 for Coles County, and 864 for the State of Illinois. New local long-term jobs created from the Project total 39 for Coles County and 54 for the State of Illinois.

Direct jobs created during the operational phase last the life of the wind farm, typically 25-40 years. Direct construction jobs and operations and maintenance jobs both require highly-skilled workers in the fields of construction, management, and engineering. These well-paid professionals boost economic development in rural communities where new employment opportunities are welcome due to economic downturns (Reategui and Tegen, 2008).

Accordingly, it is important to not just look at the number of jobs but also the earnings that they produce. The earnings impacts from the Project are shown in Table 4 and are categorized by construction impacts and operations impacts. The new local earnings during construction total over $21.8 million for Coles County and over $60 million for the State of Illinois. The new local long-term earnings total over $1.8 million for Coles County and over $3.4 million for the State of Illinois.

Table 4. — Total Earnings Impact from Coles Wind Project

	Coles County	State of Illinois
Construction		
Project Development and Onsite Earnings	$8,676,894	$15,133,089
Turbine and Supply Chain Impacts	$10,803,667	$31,678,446
Induced Impacts	$2,412,169	$13,272,970
New Local Earnings during Construction	$21,892,730	$60,084,505
Operations		
Onsite Labor Impacts	$768,934	$768,934
Local Revenue and Supply Chain Impacts	$544,815	$1,052,493
Induced Impacts	$579,034	$1,593,272
New Local Long-Term Earnings	$1,892,784	$3,414,699

Output refers to economic activity or the value of production in the state or local economy. Economic output includes the earnings reported in Table 4 but also measures other factors such as landowner payments, property taxes, and other economic activity that is not earnings and benefits from employment.

According to Table 5, the new local output during construction totals over $48.6 million for Coles County and over $154.9 million for the State of Illinois. The new local long-term output totals over $9.3 million for Coles County and over $13.3 million for the State of Illinois.

Table 5. — Total Output Impact from Coles Wind Project

	Coles County	State of Illinois
Construction		
Project Development and Onsite Jobs Impacts	$9,482,383	$16,186,502
Turbine and Supply Chain Impacts	$30,754,751	$100,937,509
Induced Impacts	$8,363,391	$37,872,593
New Local Output during Construction	$48,600,525	$154,996,604
Operations (Annual)		
Onsite Labor Impacts	$768,934	$768,934
Local Revenue and Supply Chain Impacts	$6,604,337	$8,049,908
Induced Impacts	$2,007,543	$4,546,523
New Local Long-Term Output	$9,380,814	$13,365,365

VI. Property Taxes

Wind power projects increase the property tax base of a county, creating a new revenue source for education and other local government services, such as fire protection, park districts, and road maintenance. According to state law (Public Act 095-0644), the fair cash value for a utility-scale wind turbine in Illinois is $360,000 per megawatt of capacity beginning in 2007 and is annually adjusted for inflation and depreciation. The inflation adjustment, as known as the Trending Factor, increases each year according to the Bureau of Labor Statistics' Consumer Price Index for all cities for all items. According to the Illinois Department of Revenue, "[t]he trending factor for assessment year 2019 is 1.27." (https://www2.illinois.gov/rev/localgovernments/property/Documents/WindEnergyTrendingFactors.pdf) Depreciation is allowed at 4% per year up to a maximum total depreciation of 70% of the trended real property cost basis (calculated by taking the fair cash value of the turbine and multiplying by the Trending Factor).

Tables 6-11 detail the tax implications of the Coles Wind Project. There are several important assumptions built into the analysis in these tables.

- First, the analysis assumes that the valuation of the wind farm is the same as set forth in Public Act 095-0644.
- Second, the tables assume future inflation is constant at 2.2% and the depreciation is 4% until it reaches the maximum of 70%.
- Third, all tax rates are assumed to stay constant at their 2020 (2019 tax year) rates. For example, the Coles County tax rate is assumed to stay constant at 1.20682 through 2054.
- Fourth, the analysis assumes that the Project is placed in service on January 1, 2025 at a fair cash value of $149,674,283 according to Public Act 095-0644.
- Fifth, it assumes that the Project is decommissioned in 30 years and pays no more taxes after that date.
- Sixth, since the exact placement of the turbines has not been finalized, the actual taxes paid could vary depending on the relative tax rates between districts. The percentage of turbines in each taxing jurisdiction was estimated based on the current project boundaries. If the project boundaries change or if the allocation of turbines is not proportional, the exact tax revenue could change.
- Seventh, no comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the economic impact of the Project.

Taxes in the section are only based on the value of the wind farm and do not include the value of the associated transmission systems and additional equipment and buildings. The value of these other systems will be determined by the county assessors' office and cannot be accurately estimated now. However, the value of the wind farm is determined by state law and is the basis for the tax estimates in this section. Therefore, the tax estimates in this section are conservative and total taxes paid by the Project may be higher.

According to Table 6, the taxes paid by the Project to Coles County starts out at $615,480 but declines due to depreciation (and offset by the trending factor) until it reaches the minimum in 2043. After that, the Project is at the maximum of 70% depreciation, and the trending factor causes the taxable value and taxes to increase. The average annual property taxes paid Coles County will be $408,189 over 30 years.

Table 6. — Coles County Tax Revenue from Coles Wind Project

Tax Year	Taxable Value of Wind Farm	Coles County
2025	$51,000,174	$615,480
2026	$50,037,291	$603,860
2027	$49,007,357	$591,431
2028	$47,907,888	$578,162
2029	$46,736,322	$564,023
2030	$45,490,020	$548,983
2031	$44,166,260	$533,007
2032	$42,762,238	$516,063
2033	$41,275,063	$498,116
2034	$39,701,754	$479,129
2035	$38,039,243	$459,065
2036	$36,284,366	$437,887
2037	$34,433,864	$415,555
2038	$32,484,377	$392,028
2039	$30,432,447	$367,265
2040	$28,274,510	$341,222
2041	$26,006,894	$313,856
2042	$23,625,819	$285,121
2043	$22,636,488	$273,182
2044	$23,134,490	$279,192
2045	$23,643,449	$285,334
2046	$24,163,605	$291,611
2047	$24,695,204	$298,027
2048	$25,238,499	$304,583
2049	$25,793,746	$311,284
2050	$26,361,208	$318,132
2051	$26,941,155	$325,131
2052	$27,533,860	$332,284
2053	$28,139,605	$339,594
2054	$28,758,676	$347,065
30 YEAR TOTAL		$12,245,673
30 YEAR AVG ANNUAL		$408,189

Table 6 only illustrates the taxes paid to one taxing body – Coles County. Table 7 shows an estimate of the likely taxes paid to the townships assuming that 17% of the turbines will be built in Humboldt Township, 70% in Seven Hickory Township, and 13% in Morgan Township. The exact placement of the turbines has not been finalized and the taxes paid could shift between townships depending on the final placement. In 2025, Humboldt Township should receive $92,061, Seven Hickory Township should receive $291,606, and Morgan Township should receive $73,445.

Table 7. — Township Tax Revenue from Coles Wind Project

Tax Year	Humboldt Township	Seven Hickory Township	Morgan Township
2025	$92,061	$291,606	$73,445
2026	$90,323	$286,100	$72,059
2027	$88,464	$280,211	$70,575
2028	$86,479	$273,925	$68,992
2029	$84,364	$267,226	$67,305
2030	$82,114	$260,100	$65,510
2031	$79,725	$252,531	$63,604
2032	$77,190	$244,503	$61,582
2033	$74,506	$236,000	$59,440
2034	$71,666	$227,004	$57,174
2035	$68,665	$217,499	$54,780
2036	$65,497	$207,465	$52,253
2037	$62,157	$196,884	$49,588
2038	$58,638	$185,737	$46,781
2039	$54,934	$174,005	$43,826
2040	$51,039	$161,666	$40,718
2041	$46,945	$148,701	$37,453
2042	$42,647	$135,086	$34,024
2043	$40,861	$129,430	$32,599
2044	$41,760	$132,277	$33,316
2045	$42,679	$135,187	$34,049
2046	$43,618	$138,161	$34,798
2047	$44,577	$141,201	$35,564
2048	$45,558	$144,307	$36,346
2049	$46,560	$147,482	$37,146
2050	$47,585	$150,727	$37,963
2051	$48,632	$154,043	$38,798
2052	$49,702	$157,431	$39,652
2053	$50,795	$160,895	$40,524
2054	$51,913	$164,435	$41,415
30 YEAR TOTAL	$1,831,653	$5,801,824	$1,461,278
30 YEAR AVG ANNUAL	$61,055	$193,394	$48,709

Table 8 shows an estimate of the likely taxes paid to Lake Land Community College, Parkland Community College, the Library District, Fire District, Park District, and Multi-Township Assessment District. As shown in Table 8, in 2025, Lake Land Community College should receive $304,069, Parkland Community College, $5,395; the Library District, $73,955; Fire District, $150,190; Park District, $111,655; and Multi-Township Assessment District, $25,322.

Table 8. — Tax Revenue from Coles Wind Project for Other Taxing Jurisdictions

Tax Year	Lake Land Community College	Parkland Community College	Library District	Fire District	Park District	Multi-Township Assessment District
2025	$304,069	$5,395	$73,955	$150,190	$111,655	$25,322
2026	$298,329	$5,293	$72,559	$147,355	$109,547	$24,844
2027	$292,188	$5,184	$71,066	$144,322	$107,292	$24,332
2028	$285,633	$5,068	$69,471	$141,084	$104,885	$23,786
2029	$278,648	$4,944	$67,772	$137,634	$102,320	$23,205
2030	$271,217	$4,812	$65,965	$133,964	$99,591	$22,586
2031	$263,325	$4,672	$64,045	$130,065	$96,693	$21,929
2032	$254,954	$4,524	$62,010	$125,931	$93,619	$21,231
2033	$246,087	$4,366	$59,853	$121,551	$90,363	$20,493
2034	$236,707	$4,200	$57,572	$116,918	$86,919	$19,712
2035	$226,795	$4,024	$55,161	$112,022	$83,279	$18,886
2036	$216,332	$3,838	$52,616	$106,854	$79,437	$18,015
2037	$205,299	$3,643	$49,933	$101,404	$75,386	$17,096
2038	$193,676	$3,436	$47,106	$95,663	$71,118	$16,128
2039	$181,442	$3,219	$44,130	$89,621	$66,626	$15,110
2040	$168,576	$2,991	$41,001	$83,266	$61,901	$14,038
2041	$155,056	$2,751	$37,713	$76,588	$56,937	$12,912
2042	$140,860	$2,499	$34,260	$69,576	$51,724	$11,730
2043	$134,962	$2,395	$32,825	$66,662	$49,558	$11,239
2044	$137,931	$2,447	$33,547	$68,129	$50,648	$11,486
2045	$140,965	$2,501	$34,285	$69,628	$51,763	$11,739
2046	$144,066	$2,556	$35,040	$71,159	$52,901	$11,997
2047	$147,236	$2,612	$35,811	$72,725	$54,065	$12,261
2048	$150,475	$2,670	$36,598	$74,325	$55,255	$12,531
2049	$153,786	$2,729	$37,404	$75,960	$56,470	$12,807
2050	$157,169	$2,789	$38,226	$77,631	$57,713	$13,088
2051	$160,627	$2,850	$39,067	$79,339	$58,982	$13,376
2052	$164,160	$2,913	$39,927	$81,084	$60,280	$13,671
2053	$167,772	$2,977	$40,805	$82,868	$61,606	$13,971
2054	$171,463	$3,042	$41,703	$84,691	$62,961	$14,279
30 YEAR TOTAL	$6,049,802	$107,344	$1,471,425	$2,988,207	$2,221,496	$503,801
30 YEAR AVG ANNUAL	$201,660	$3,578	$49,047	$99,607	$74,050	$16,793

Table 9 shows an estimate of the likely taxes paid to the Coles County Airport Authority, East Oakland Cemetery District, and North Fork River Conservation District. As shown in Table 9, in 2025, the Coles County Airport Authority should receive $33,777; East Oakland Cemetery District, $70,661; and North Fork River Conservation District, $35,802.

Table 9. — Tax Revenue from Coles Wind Project for Other Taxing Jurisdictions

Tax Year	Coles County Airport Authority	East Oakland Cemetery District	North Fork River Conservation District
2025	$33,777	$70,661	$35,802
2026	$33,140	$69,327	$35,126
2027	$32,458	$67,900	$34,403
2028	$31,729	$66,376	$33,631
2029	$30,953	$64,753	$32,809
2030	$30,128	$63,026	$31,934
2031	$29,251	$61,192	$31,005
2032	$28,321	$59,247	$30,019
2033	$27,336	$57,187	$28,975
2034	$26,294	$55,007	$27,871
2035	$25,193	$52,703	$26,704
2036	$24,031	$50,272	$25,472
2037	$22,806	$47,708	$24,173
2038	$21,514	$45,007	$22,804
2039	$20,155	$42,164	$21,364
2040	$18,726	$39,174	$19,849
2041	$17,224	$36,033	$18,257
2042	$15,647	$32,734	$16,585
2043	$14,992	$31,363	$15,891
2044	$15,322	$32,053	$16,240
2045	$15,659	$32,758	$16,598
2046	$16,004	$33,479	$16,963
2047	$16,356	$34,215	$17,336
2048	$16,715	$34,968	$17,717
2049	$17,083	$35,737	$18,107
2050	$17,459	$36,523	$18,506
2051	$17,843	$37,327	$18,913
2052	$18,236	$38,148	$19,329
2053	$18,637	$38,987	$19,754
2054	$19,047	$39,845	$20,189
30 YEAR TOTAL	$672,040	$1,405,875	$712,324
30 YEAR AVG ANNUAL	$22,401	$46,862	$23,744

The largest taxing jurisdictions for property taxes are local school districts. However, the tax implications for school districts are more complicated than for other taxing bodies. School districts receive state aid based on the assessed value of the taxable property within its district. As assessed value increases, the state aid to the school district is decreased. The Center for Renewable Energy at Illinois State University did a report titled Wind Farm Implications for School District Revenue which details how a wind farm affects the local school district's revenue. Although the school district collects increased local property tax revenue from the wind farm, it receives less from General State Aid (GSA) because of the increases in Equalized Assessed Value (EAV) due to the wind farm. **However, the reduction in state aid is much smaller than the increased tax revenue.**

Although the exact amount of the reduction in General State Aid to the school districts is uncertain, local project tax revenue is superior to relying on GSA for the following reasons: (1) the wind turbines can't relocate – it is a permanent structure that will be within the school district's footprint for the life of the Project; (2) the school district can raise the tax rate and increase its revenues as needed; (3) the school district does not have to deal with the year-to-year uncertainty of GSA amounts; (4) the school district does not have to wait for months (or even into the next Fiscal Year!) for payment; (5) the Project does not increase the overall cost of education in the way that a new residential development would.

Table 10 shows the direct property tax revenue coming from the Project to Oakland CUSD 5, Charleston CUSD 1, Mattoon CUSD 2, and Arcola CUSD 306. This tax revenue uses the assumptions outlined earlier to calculate the other tax revenue and assumes that 5% of the turbines are in Oakland CUSD 5, 70% are in Charleston CUSD 1, 17.5% are in Mattoon CUSD 2, and 7.5% are in Arcola CUSD 306. Over the 30-year life of the Project, school districts are expected to receive over $43.5 million in tax revenue.

Table 10. — School District Tax Implications of Coles Wind Project

Tax Year	Oakland CUSD 5	Charleston CUSD 1	Mattoon CUSD 2	Arcola CUSD 306
2025	$126,199	$1,508,573	$383,549	$171,640
2026	$123,817	$1,480,091	$376,307	$168,399
2027	$121,268	$1,449,626	$368,562	$164,933
2028	$118,548	$1,417,104	$360,293	$161,233
2029	$115,649	$1,382,449	$351,482	$157,290
2030	$112,565	$1,345,584	$342,109	$153,096
2031	$109,289	$1,306,427	$332,154	$148,640
2032	$105,815	$1,264,897	$321,595	$143,915
2033	$102,135	$1,220,906	$310,411	$138,910
2034	$98,242	$1,174,368	$298,579	$133,615
2035	$94,128	$1,125,192	$286,076	$128,020
2036	$89,785	$1,073,283	$272,878	$122,114
2037	$85,206	$1,018,545	$258,961	$115,886
2038	$80,382	$960,880	$244,300	$109,325
2039	$75,305	$900,184	$228,868	$102,420
2040	$69,965	$836,353	$212,640	$95,157
2041	$64,354	$769,278	$195,586	$87,526
2042	$58,462	$698,846	$177,679	$79,512
2043	$56,014	$669,582	$170,239	$76,183
2044	$57,246	$684,313	$173,984	$77,859
2045	$58,505	$699,368	$177,811	$79,571
2046	$59,793	$714,754	$181,723	$81,322
2047	$61,108	$730,478	$185,721	$83,111
2048	$62,452	$746,549	$189,807	$84,940
2049	$63,826	$762,973	$193,983	$86,808
2050	$65,231	$779,758	$198,250	$88,718
2051	$66,666	$796,913	$202,612	$90,670
2052	$68,132	$814,445	$207,069	$92,665
2053	$69,631	$832,363	$211,625	$94,703
2054	$71,163	$850,675	$216,281	$96,787
30 YEAR TOTAL	$2,510,880	$30,014,756	$7,631,134	$3,414,967
30 YEAR AVG ANNUAL	$83,696	$1,000,492	$254,371	$113,832

Having considered all these benefits, it is still important to determine the net impact of the wind energy project after taking into account the reduction in school funding from the State of Illinois. Determining the reduction in GSA is complicated by the fact that there is a new law for distributing state funds to education.

On August 31, 2017, Governor Rauner signed into law PA 100-0465 that fundamentally changes the way that the state distributes state aid to school districts. The funding consists of two parts – a Base Funding Minimum and a Tier Funding. The Base Funding Minimum in FY18 is based on what the district received in FY 17 under the old funding formula. Some call this the "Hold Harmless" provision and ensures that there are no "losing" districts in the transition to the new funding formula. The Tier Funding is additional money and goes in higher portion to the districts that demonstrate a higher need under the new formula. Because of the "Hold Harmless" provision, no school district will see a reduction in their GSA from what they received in the year before the wind farm was installed. However, the higher EAV caused by the wind farm will reduce its eligibility for new money allocated in the state budget.

There are several sources of uncertainty with the new school funding formula concerning this new money. First, the total amount of new funding to be distributed over the next ten years is unknown at this point. It will be determined year-by-year in the state budget passed by the legislature and signed by the governor. For FY21, no new money was allocated for the school funding formula in the recently passed state budget. Second, data for the formula funding changes each year based on the school's student population and its "need" and it is difficult to forecast its school's student population over time. Third, each school district is competing with all other school districts for this new funding and so the EAV and student population for all other school districts in the state will impact what a single school district receives. Fourth, the school district's EAV could also change due to other property changes in the district.

In order to determine the net impact of the Project on a school district's eligibility for new GSA money, we can make the following assumptions: (1) that the State of Illinois continues to provide $350 million in NEW state aid to education ANNUALLY. For reference, the new law passed in 2017 provided $350 million and the FY19 state budget has $350 million. Given the current imbalance in the state budget, this a very optimistic assumption; (2) that the school districts will forfeit ALL of the new Tier funding for schools. It seems more likely that the school districts will switch tiers rather than lose all funding; (3) that the school districts would be entitled to the same tiered funding annually for the 10 years covered by the new school funding law without the wind farm; (4) that other school districts in the State of Illinois have a constant EAV and Evidence Based Funding needs.

For FY20, Charleston CUSD #1 had 64% adequacy and was assigned Tier 1 status and received $535,995 in "new money." Mattoon CUSD #2 had 64% adequacy and was assigned Tier 1 and received $728,723 in "new money." Oakland CUSD #5 had 82% adequacy and was assigned Tier 2 and received $8,886. For FY21, none of these districts are receiving any "new money" because none was allocated in the state budget. If new money is allocated in the future, it is unlikely that these districts will lose all of the "new money" and their GSA finding cannot go down.

Summary

Table 11 shows the sum of all the property taxes listed in Tables 6 through 10 by year. In 2025, the total property tax will be over $4.0 million. It reaches the bottom in 2043 when the Project reaches its maximum depreciation and then grows due to the trending factor. Over the 30-year life of the Project, the total property taxes paid to the various taxing entities will be over $81 million with an annual average of over $2.7 million.

Table 11 — Total Property Tax Revenue from Coles Wind Project

Tax Year	Total Taxes
2025	$4,073,380
2026	$3,996,475
2027	$3,914,214
2028	$3,826,399
2029	$3,732,826
2030	$3,633,284
2031	$3,527,556
2032	$3,415,417
2033	$3,296,636
2034	$3,170,976
2035	$3,038,191
2036	$2,898,030
2037	$2,750,230
2038	$2,594,525
2039	$2,430,637
2040	$2,258,283
2041	$2,077,169
2042	$1,886,992
2043	$1,807,975
2044	$1,847,750
2045	$1,888,400
2046	$1,929,945
2047	$1,972,404
2048	$2,015,797
2049	$2,060,144
2050	$2,105,468
2051	$2,151,788
2052	$2,199,127
2053	$2,247,508
2054	$2,296,953
30 YEAR TOTAL	$81,044,479
30 YEAR AVG ANNUAL	$2,701,483

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National Renewable Energy Laboratory (NREL), 2008b. Economic Benefits, Carbon Dioxide (CO2) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power in Idaho. Technical Report DOE/GO-102008-2671, October 2008. NREL, Golden, CO. Available at <http://www.nrel.gov/docs/fy09osti/44145.pdf>.

National Renewable Energy Laboratory (NREL), 2008c. Economic Benefits, Carbon Dioxide (CO2) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power in Maine. Technical Report DOE/GO-102008-2672, October 2008. NREL, Golden, CO. Available at <http://www.nrel.gov/docs/fy09osti/44146.pdf>.

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Reategui, S., Stafford, E.R., Hartman, C.L., Huntsman, J.M., 2009. Generating Economic Development from a Wind Power Project in Spanish Fork Canyon, Utah: A Case Study and Analysis of State-Level Economic Impacts. DOE/GO-102009-2760. January 2009. Available at <http://www.windpoweringamerica.gov/pdfs/economic_development/2009/ut_spanish_fork.pdf>.

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VIII. Curriculum Vita - David Loomis

David G. Loomis
Illinois State University
Department of Economics
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Education

Doctor of Philosophy, Economics, Temple University, Philadelphia, Pennsylvania, May 1995.

Bachelor of Arts, Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985.

Experience

1996-present Illinois State University, Normal, IL
Full Professor – Department of Economics (2010-present)
Associate Professor - Department of Economics (2002-2009)
Assistant Professor - Department of Economics (1996-2002)

- Taught Regulatory Economics, Telecommunications Economics and Public Policy, Industrial Organization and Pricing, Individual and Social Choice, Economics of Energy and Public Policy and a Graduate Seminar Course in Electricity, Natural Gas and Telecommunications Issues.
- Supervised as many as 5 graduate students in research projects each semester.
- Served on numerous departmental committees.

1997-present Institute for Regulatory Policy Studies, Normal, IL
Executive Director (2005-present)
Co-Director (1997-2005)

- Grew contributing membership from 5 companies to 16 organizations.
- Doubled the number of workshop/training events annually.
- Supervised 2 Directors, Administrative Staff and internship program.
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries.

Experience (cont'd)

2006-2018 Illinois Wind Working Group, Normal, IL
Director

- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and bylaws

2007-2018 Center for Renewable Energy, Normal, IL
Director

- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education.
- Secured over $150,000 in funding from private companies.
- Hired and supervised 4 professional staff members and supervised 3 faculty members as Associate Directors.
- Reviewed renewable energy manufacturing grant applications for Illinois Department of Commerce and Economic Opportunity for a $30 million program.
- Created technical "Due Diligence" documents for the Illinois Finance Authority loan program for wind farm projects in Illinois.

2011-present Strategic Economic Research, LLC
President

- Performed economic impact analyses on policy initiatives and energy projects such as wind energy, solar energy, natural gas plants and transmission lines at the county and state level.
- Provided expert testimony before state legislative bodies, state public utility commissions, and county boards.
- Wrote telecommunications policy impact report comparing Illinois to other Midwestern states.

1997-2002 International Communications Forecasting Conference
Chair

- Expanded Planning Committee with representatives from over 18 different international companies and delivered high quality conference attracting over 500 people over 4 years.

Experience (cont'd)

1985-1996 Bell Atlantic, Philadelphia, Pa.
Economist - Business Research

- Wrote and taught Applied Business Forecasting multimedia course.
- Developed and documented 25 econometric demand models that were used in regulatory filings.
- Provided statistical and analytic support to regulatory costing studies.
- Served as subject matter expert in switched and special access.
- Administered $4 million budget including $1.8 million consulting budget.

Professional Awards and Memberships

2016 Outstanding Cross-Disciplinary Team Research Award with Jin Jo and Matt Aldeman – recognizes exemplary collaborative research conducted by multiple investigators from different disciplines.

2011 Midwestern Regional Wind Advocacy Award from the U. S. Department of Energy's Wind Powering America presented at WindPower 2011

2009 Economics Department Scott M. Elliott Faculty Excellence Award – awarded to faculty who demonstrate excellence in teaching, research and service.

2009 Illinois State University Million Dollar Club – awarded to faculty who have over $1 million in grants through the university.

2008 Outstanding State Wind Working Group Award from the U. S. Department of Energy's Wind Power America presented at WindPower 2008.

1999 Illinois State University Teaching Initiative Award

Member of the American Economic Association, National Association of Business Economists, International Association for Energy Economics, Institute for Business Forecasters; Institute for International Forecasters, International Telecommunications Society.

Professional Publications

34. Aldeman, M.R., Jo, J.H., and Loomis, D.G. (2018). Quantification of Uncertainty Associated with Wind Assessments of Various Intervals, Transactions of the Canadian Society for Mechanical Engineering, forthcoming.

33. Jin, J.H., Cross, J., Rose, Z., Daebel, E., Verderber, A., and Loomis, D. G. (2016). Financing options and economic impact: distributed generation using solar photovoltaic systems in Normal, Illinois, AIMS Energy, 4(3): 504-516.

Professional Publications (cont'd)

32. Loomis, D.G., Hayden, J., Noll, S. and Payne, J.E. (2016). Economic Impact of Wind Energy Development in Illinois, The Journal of Business Valuation and Economic Loss Analysis, 11(1), 3-23.

31. Loomis, D.G., Jo, J.H., and Aldeman, M.R., (2016). Economic Impact Potential of Solar Photovoltiacs in Illinois, Renewable Energy, 87, 253-258.

30. Aldeman, M.R., Jo, J.H., and Loomis, D.G. (2015). The Technical Potential for Wind Energy in Illinois, Energy, 90(1), 1082-1090.

29. Tegen, S., Keyser, D., Flores-Espino, F., Miles, J., Zammit, D. and Loomis, D. (2015). Offshore Wind Jobs and Economic Development Impacts in the United States: Four Regional Scenarios, National Renewable Energy Laboratory Technical Report, NREL/TP-5000-61315, February.

28. Loomis, D. G. and Bowden, N. S. (2013). Nationwide Database of Electric Rates to Become Available, Natural Gas & Electricity, 30 (5), 20-25.

27. Jin, J. H., Loomis, D. G., and Aldeman, M. R. (2013). Optimum penetration of utility-scale grid-connected solar photovoltaic systems in Illinois, Renewable Energy, 60, 20-26.

26. Malm, E., Loomis, D. G., DeFranco, J. (2012). A Campus Technology Choice Model with Incorporated Network Effects: Choosing Between General Use and Campus Systems, International Journal of Computer Trends and Technology, 3(4), 622-629.

25. Chupp, B. A., Hickey, E.A. & Loomis, D. G. (2012). Optimal Wind Portfolios in Illinois, Electricity Journal, 25, 46-56.

24. Hickey, E., Loomis, D. G., & Mohammadi, H. (2012). Forecasting hourly electricity prices using ARMAX-GARCH models: An application to MISO hubs, Energy Economics, 34, 307-315.

23. Theron, S., Winter, J.R, Loomis, D. G., & Spaulding, A. D. (2011). Attitudes Concerning Wind Energy in Central Illinois. Journal of the America Society of Farm Managers and Rural Appraisers, 74, 120-128.

22. Payne, J. E., Loomis, D. G. & Wilson, R. (2011). Residential Natural Gas Demand in Illinois: Evidence from the ARDL Bounds Testing Approach. Journal of Regional Analysis and Policy, 41(2), 138.

Professional Publications (cont'd)

21. Loomis, D. G. & Ohler, A. O. (2010). Are Renewable Portfolio Standards A Policy Cure-all? A Case Study of Illinois's Experience. Environmental Law and Policy Review, 35, 135-182.

20. Gil-Alana, L. A., Loomis, D. G., & Payne, J. E. (2010). Does energy consumption by the U.S. electric power sector exhibit long memory behavior ? Energy Policy, 38, 7512-7518.

19. Carlson, J. L., Payne, J. E., & Loomis, D. G. (2010). An assessment of the Economic Impact of the Wind Turbine Supply Chain in Illinois. Electricity Journal, 13, 75-93.

18. Apergis, N., Payne, J. E., & Loomis, D. G. (2010). Are shocks to natural gas consumption transitory or permanent? Energy Policy, 38, 4734-4736.

17. Apergis, N., Payne, J. E., & Loomis, D. G. (2010). Are fluctuations in coal consumption transitory or permanent? Evidence from a panel of U.S. states. Applied Energy, 87, 2424-2426.

16. Hickey, E. A., Carlson, J. L., & Loomis, D. G. (2010). Issues in the determination of the optimal portfolio of electricity supply options. Energy Policy, 38, 2198-2207.

15. Carlson, J. L., & Loomis, D. G. (2008). An assessment of the impact of deregulation on the relative price of electricity in Illinois. Electricity Journal, 21, 60-70.

14. Loomis, D. G., (2008). The telecommunications industry. In H. Bidgoli (Ed.), The handbook of computer networks (pp. 3-19). Hoboken, NJ: John Wiley & Sons.

13. Cox, J. E., Jr., & Loomis, D. G. (2007). A managerial approach to using error measures in the evaluation of forecasting methods. International Journal of Business Research, 7, 143-149.

12. Cox, J. E., Jr., & Loomis, D. G. (2006). Improving forecasting through textbooks – a 25 year review. International Journal of Forecasting, 22, 617-624.

11. Swann, C. M., & Loomis, D. G. (2005). Competition in local telecommunications – there's more than you think. Business Economics, 40, 18-28.

10. Swann, C. M., & Loomis, D. G. (2005). Intermodal competition in local telecommunications markets. Information Economics and Policy, 17, 97-113.

Professional Publications (cont'd)

9. Swann, C. M., & Loomis, D. G. (2004) Telecommunications demand forecasting with intermodal competition – a multi-equation modeling approach. Telektronikk, 100, 180-184.

8. Cox, J. E., Jr., & Loomis, D. G. (2003). Principles for teaching economic forecasting. International Review of Economics Education, 1, 69-79.

7. Taylor, L. D. & Loomis, D. G. (2002). Forecasting the internet: understanding the explosive growth of data communications. Boston: Kluwer Academic Publishers.

6. Wiedman, J. & Loomis, D. G. (2002). U.S. broadband pricing and alternatives for internet service providers. In D. G. Loomis & L. D. Taylor (Eds.) Boston: Kluwer Academic Publishers.

5. Cox, J. E., Jr. & Loomis, D. G. (2001). Diffusion of forecasting principles: an assessment of books relevant to forecasting. In J. S. Armstrong (Ed.), Principles of Forecasting: A Handbook for Researchers and Practitioners (pp. 633-650). Norwell, MA: Kluwer Academic Publishers.

4. Cox, J. E., Jr. & Loomis, D. G. (2000). A course in economic forecasting: rationale and content. Journal of Economics Education, 31, 349-357.

3. Malm, E. & Loomis, D. G. (1999). Active market share: measuring competitiveness in retail energy markets. Utilities Policy, 8, 213-221.

2. Loomis, D. G. (1999). Forecasting of new products and the impact of competition. In D. G. Loomis & L. D. Taylor (Eds.), The future of the telecommunications industry: forecasting and demand analysis. Boston: Kluwer Academic Publishers.

Loomis, D. G. (1997). Strategic substitutes and strategic complements with interdependent demands. The Review of Industrial Organization, 12,
781-791.

Expert Testimony

23. McLean County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Invenergy, LLC, Direct Oral Testimony, January 4, 2018.

22. New Mexico Public Regulation Commission, Case No. 17-00275-UT, Application of Sagamore Wind Energy LLC, on behalf of Invenergy, LLC, Direct Written Testimony filed November 6, 2017.

Expert Testimony (cont'd)

21. Ohio Power Siting Board, Case No. 17-773-EL-BGN, In the Matter of Hardin Solar Energy LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Solar-Powered Electric Generation Facility in Hardin County, Ohio, on behalf of Invenergy, LLC, Exhibit with Report filed July 5, 2017.

20. Macon County (Illinois) Environmental, Education, Health and Welfare Committee, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of E.ON Energy, Direct Oral Testimony, August 20, 2015.

19. Illinois Commerce Commission, Case No. 15-0277, Oral Cross-examination Testimony on behalf of Grain Belt Express Clean Line LLC appeared before the Commission on August 19, 2015.

18. Macon County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of E.ON Energy, Direct Oral Testimony, August 11, 2015.

17. Illinois Commerce Commission, Case No. 15-0277, Written Rebuttal Testimony on behalf of Grain Belt Express Clean Line LLC filed August 7, 2015.

16. Kankakee County (Illinois) Planning, Zoning, and Agriculture Committee, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of EDF Renewables, Direct Oral Testimony, July 22, 2015.

15. Kankakee County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of EDF Renewables, Direct Oral Testimony, July 13, 2015.

14. Bureau County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Berkshire Hathaway Energy/Geronimo Energy, Direct Oral Testimony, June 16, 2015.

13. Illinois Commerce Commission, Case No. 15-0277, Written Direct Testimony on behalf of Grain Belt Express Clean Line LLC filed April 10, 2015.

12. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Invenergy, Oral Cross-Examination, December 8-9, 2014.

Expert Testimony (cont'd)

11. Missouri Public Service Commission, Case No. EA-2014-0207, Oral Cross-examination Testimony on behalf of Grain Belt Express Clean Line LLC appeared before the Commission on November 21, 2014.

10. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Invenergy, Direct Oral Testimony, November 17-19, 2014.

9. Missouri Public Service Commission, Case No. EA-2014-0207, Written Surrebuttal Testimony on behalf of Grain Belt Express Clean Line LLC, filed October 14, 2014.

8. Missouri Public Service Commission, Case No. EA-2014-0207, Written Direct Testimony on behalf of Grain Belt Express Clean Line LLC, filed March 26, 2014.

7. Illinois Commerce Commission, Case No. 12-0560, Oral Cross-examination Testimony on behalf of Rock Island Clean Line LLC appeared before the Commission on December 11, 2013.

6. Illinois Commerce Commission, Case No. 12-0560, Written Rebuttal Testimony on behalf of Rock Island Clean Line LLC filed August 20, 2013.

5. Boone County (Illinois) Board, Examination of Wind Energy Conversion System Ordinance, Direct Testimony and Cross-Examination, April 23, 2013.

4. Illinois Commerce Commission, Case No. 12-0560, Written Direct Testimony on behalf of Rock Island Clean Line LLC filed October 10, 2012.

3. Whiteside County (Illinois) Board and Whiteside County Planning and Zoning Committee, Examination of Wind Energy Conversion System Ordinance, Direct Testimony and Cross-Examination, on behalf of the Center for Renewable Energy, April 12, 2012.

2. State of Illinois Senate Energy and Environment Committee, Direct Testimony and Cross-Examination, on behalf of the Center for Renewable Energy, October 28, 2010.

1. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of the Center for Renewable Energy, Direct Testimony and Cross-Examination, July 28, 2010.

Selected Presentations

"Smart Cities and Micro Grids: Cost Recovery Issues," presented September 12,2017 at the National Association of Regulatory Utility Commissioners Staff Subcommittee on Accounting and Finance Meeting, Springfield, IL.

"Cloud Computing: Regulatory Principles and ICC NOI," presented September 11,2017 at the National Association of Regulatory Utility Commissioners Staff Subcommittee on Accounting and Finance Meeting, Springfield, IL.

"Illinois Wind, Illinois Solar and the Illinois Future Energy Jobs Act," presented July 25, 2017 at the Illinois County Assessors Meeting, Normal, IL.

"Illinois Wind, Illinois Solar and the Illinois Future Energy Jobs Act," presented April 21, 2017 at the Illinois Association of County Zoning Officers Meeting, Bloomington, IL.

"Energy Storage Economics and RTOs," presented October 30, 2016 at the Energy Storage Conference at Argonne National Laboratory.

"Wind Energy in Illinois," on October 6, 2016 at the B/N Daybreak Rotary Club, Bloomington, IL.

"Smart Grid for Schools," presented August 17, 2016 to the Ameren External Affairs Meeting, Decatur, IL.

"Solar Energy in Illinois," presented July 28, 2016 at the 3rd Annual K-12 Teachers Clean Energy Workshop, Richland Community College, Decatur, IL

"Wind Energy in Illinois," presented July 28, 2016 at the 3rd Annual K-12 Teachers Clean Energy Workshop, Richland Community College, Decatur, IL

"Smart Grid for Schools," presented June 21, 2016 at the ISEIF Grantee and Ameren Meeting, Decatur, IL.

"Costs and Benefits of Renewable Energy," presented November 4, 2015 at the Osher Lifelong Learning Institute at Bradley, University, Peoria, IL.

"Energy Sector Workforce Issues," presented September 17, 2015 at the Illinois Workforce Investment Board, Springfield, IL.

"The Past, Present and Future of Wind Energy in Illinois," presented March 13, 2015 at the Peoria Rotary Club, Peoria, IL.

"Where Are All the Green Jobs?" presented January 28, 2015 at the 2015 Illinois Green Economy Network Sustainability Conference, Normal, IL.

Presentations (cont'd)

"Teaching Next Generation Energy Concepts with Next Generation Science Standards: Addressing the Critical Need for a More Energy-Literate Workforce," presented September 30, 2014 at the Mathematics and Science Partnerships Program 2014 Conference in Washington, DC.

"National Utility Rate Database," presented October 23, 2013 at Solar Power International, Chicago, IL.

"Potential Economic Impact of Offshore Wind Energy in the Great Lakes," presented May 6, 2013 at WindPower 2013, Chicago, IL.

"Why Illinois? Windy City, Prairie Power," presented May 5, 2013 at WindPower 2013, Chicago, IL.

"National Utility Rate Database," presented January 29, 2013 at the EUEC Conference, Phoenix, AZ.

"Energy Learning Exchange and Green Jobs," presented December 13, 2012 at the TRICON Meeting of Peoria and Tazewell County Counselors, Peoria, IL.

"Potential Economic Impact of Offshore Wind Energy in the Great Lakes," presented November 12, 2012 at the Offshore Wind Jobs and Economic Development Impacts Webinar.

"Energy Learning Exchange," presented October 31, 2012 at the Utility Workforce Development Meeting, Chicago, IL.

"Wind Energy in McLean County," presented June 26, 2012 at BN By the Numbers, Normal, IL.

"Wind Energy," presented June 14, 2012 at the Wind for Schools Statewide Teacher Workshop, Normal, IL.

"Economic Impact of Wind Energy in Illinois," presented June 6, 2012 at AWEA's WINDPOWER 2012, Atlanta, GA.

"Trends in Illinois Wind Energy," presented March 6, 2012 at the AWEA Regional Wind Energy Summit – Midwest in Chicago, IL.

"Challenges and New Growth Strategies in the Wind Energy Business," invited plenary session speaker at the Green Revolution Leaders Forum, November 18, 2011 in Seoul, South Korea.

"Overview of the Center for Renewable Energy," presented July 20, 2011 at the University-Industry Consortium Meeting at Illinois Institute of Technology, Chicago, IL.

Presentations (cont'd)

"Building the Wind Turbine Supply Chain," presented May 11, 2011 at the Supply Chain Growth Conference, Chicago, IL

"Building a Regional Energy Policy for Economic Development," presented April 4, 2011 at the Midwestern Legislative Conference's Economic Development Committee Webinar.

"Wind Energy 101," presented February 7, 2011 at the Wind Power in Central Illinois - A Public Forum, CCNET Renewable Energy Group, Champaign, IL.

"Alternative Energy Strategies," presented with Matt Aldeman November 19, 2010 at the Innovation Talent STEM Education Forum, Chicago, IL.

"Siting and Zoning in Illinois," presented November 17, 2010 at the Wind Powering America Webinar.

"What Governor Quinn Should Do about Energy?" presented November 15, 2010 at the Illinois Chamber of Commerce Energy Forum Conference, Chicago, IL.

"Is Wind Energy Development Right for Illinois," presented with Matt Aldeman October 28, 2010 at the Illinois Association of Illinois County Zoning Officials Annual Seminar in Utica, IL.

"Economic Impact of Wind Energy in Illinois," presented July 22, 2010 at the AgriEnergy Conference in Champaign, IL.

"Renewable Energy Major at ISU," presented July 21, 2010 at Green Universities and Colleges Subcommittee Webinar.

"Economics of Wind Energy," presented May 19, 2010 at the U.S. Green Building Council meeting in Chicago, IL.

"Forecasting: A Primer for the Small Business Entrepreneur," presented with James E. Cox, Jr. April 14, 2010 at the Allied Academies' Spring International Conference in New Orleans, LA.

"Are Renewable Portfolio Standards a Policy Cure-All? A Case Study of Illinois' Experience," presented January 30, 2010 at the 2010 William and Mary Environmental Law and Policy Review Symposium in Williamsburg, VA.

"Creating Partnerships between Universities and Industry," presented November 19, 2009, at New Ideas in Educating a Workforce in Renewable Energy and Energy Efficiency in Albany, NY.

"Educating Illinois in Renewable Energy, presented November 14, 2009 at the Illinois Science Teachers Association in Peoria, IL.

Presentations (cont'd)

"Green Collar Jobs," invited presentation October 14, 2009 at the 2009 Workforce Forum in Peoria, IL.

"The Role of Wind Power in Illinois," presented March 4, 2009 at the Association of Illinois Electric Cooperatives Engineering Seminar in Springfield, IL.

"The Economic Benefits of Wind Farms," presented January 30, 2009 at the East Central Illinois Economic Development District Meeting in Champaign, IL.

"Green Collar Jobs in Illinois," presented January 6, 2009 at the Illinois Workforce Investment Board Meeting in Macomb, Illinois.

"Green Collar Jobs: What Lies Ahead for Illinois?" presented August 1, 2008 at the Illinois Employment and Training Association Conference.

"Mapping Broadband Access in Illinois," presented October 16, 2007 at the Rural Telecon '07 conference.

"A Managerial Approach to Using Error Measures to Evaluate Forecasting Methods," presented October 15, 2007 at the International Academy of Business and Economics.

"Dollars and Sense: The Pros and Cons of Renewable Fuel," presented October 18, 2006 at Illinois State University Faculty Lecture Series.

"Broadband Access in Illinois," presented July 28, 2006 at the Illinois Association of Regional Councils Annual Meeting.

"Broadband Access in Illinois," presented November 17, 2005 at the University of Illinois' Connecting the e to Rural Illinois.

"Improving Forecasting Through Textbooks – A 25 Year Review," with James E. Cox, Jr., presented June 14, 2005 at the 25th International Symposium on Forecasting.

"Telecommunications Demand Forecasting with Intermodal Competition, with Christopher Swann, presented April 2, 2004 at the Telecommunications Systems Management Conference 2004.

"Intermodal Competition," with Christopher Swann, presented April 3, 2003 at the Telecommunications Systems Management Conference 2003.

Presentations (cont'd)

"Intermodal Competition in Local Exchange Markets," with Christopher Swann, presented June 26, 2002 at the 20th Annual International Communications Forecasting Conference.

"Assessing Retail Competition," presented May 23, 2002 at the Institute for Regulatory Policy Studies' Illinois Energy Policy for the 21st Century workshop.

"The Devil in the Details: An Analysis of Default Service and Switching," with Eric Malm presented May 24, 2001 at the 20th Annual Advanced Workshop on Regulation and Competition.

"Forecasting Challenges for U.S. Telecommunications with Local Competition," presented June 28, 1999 at the 19th International Symposium on Forecasting.

"Acceptance of Forecasting Principles in Forecasting Textbooks," presented June 28, 1999 at the 19th International Symposium on Forecasting.

"Forecasting Challenges for Telecommunications With Local Competition," presented June 17, 1999 at the 17th Annual International Communications Forecasting Conference.

"Measures of Market Competitiveness in Deregulating Industries," with Eric Malm, presented May 28, 1999 at the 18th Annual Advanced Workshop on Regulation and Competition.

"Trends in Telecommunications Forecasting and the Impact of Deregulation," Proceedings of EPRI's 11th Forecasting Symposium, 1998.

"Forecasting in a Competitive Age: Utilizing Macroeconomic Forecasts to Accurately Predict the Demand for Services," invited speaker, Institute for International Research Conference, September 29, 1997.

"Regulatory Fairness and Local Competition Pricing," presented May 30, 1996 at the 15th Annual Advanced Workshop in Regulation and Public Utility Economics.

"Optimal Pricing For a Regulated Monopolist Facing New Competition: The Case of Bell Atlantic Special Access Demand," presented May 28, 1992 at the Rutgers Advanced Workshop in Regulation and Public Utility Economics.

Grants

"SmartGrid for Schools 2018 and Energy Challenge," with William Hunter, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002 - extended, January 2017, $300,000.

"Energy Learning Exchange - Implementing Nationally Recognized Energy Curriculum and Credentials in Illinois," Northern Illinois University, RSP Award # A17-0098, February, 2017, $13,000.

"SmartGrid for Schools 2017 and Energy Challenge," with William Hunter, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002 - extended, January 2017, $350,000.

"Illinois Jobs Project," University of California Berkeley, RSP Award # A16-0148, August, 2016, $10,000.

"Energy Workforce Ready Through Building Performance Analysis," Illinois Department of Commerce and Economic Opportunity through the Department of Labor, RSP # A16-0139, June, 2016, $328,000 (grant was de-obligated before completion).

"SmartGrid for Schools 2016 and Smart Appliance Challenge," with William Hunter, Brad Christenson and Jeritt Williams, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002, January 2016, $450,000.

"SmartGrid for Schools 2015," with William Hunter and Matt Aldeman, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-001, February 2015, $400,000.

"Economic Impact of Nuclear Plant Closings: A Response to HR 1146," Illinois Department of Economic Opportunity, RSP Award # 14-025001 amended, January, 2015, $22,000.

"Partnership with Midwest Renewable Energy Association for Solar Market Pathways" with Missy Nergard and Jin Jo, U.S. Department of Energy Award Number DE-EE0006910, October, 2014, $109,469 (ISU Award amount).

"Renewable Energy for Schools," with Matt Aldeman and Jin Jo, Illinois Department of Commerce and Economic Opportunity, Award Number 14-025001, June, 2014, $130,001.

"SmartGrid for Schools 2014," with William Hunter and Matt Aldeman, Illinois Science and Energy Innovation Foundation, RSP # 14B116, March 2014, $451,701.

"WINDPOWER 2014 Conference Exhibit," Illinois Department of Commerce and Economic Opportunity, RSP #14C167, March, 2014, $95,000.

Grants (cont'd)

"Lake Michigan Offshore Wind Energy Buoy," with Matt Aldeman, Illinois Clean Energy Community Foundation, Request ID 6435, November, 2013, $90,000.

"Teaching Next Generation Energy Concepts with Next Generation Science Standards," with William Hunter, Matt Aldeman and Amy Bloom, Illinois State Board of Education, RSP # 13B170A, October, 2013, second year, $159,954; amended to $223,914.

"Solar for Schools," with Matt Aldeman, Illinois Green Economy Network, RSP # 13C280, August, 2013, $66,072.

"Energy Learning Exchange Implementation Grant," with William Hunter and Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 13-052003, June, 2013, $350,000.

"Teaching Next Generation Energy Concepts with Next Generation Science Standards," with William Hunter, Matt Aldeman and Amy Bloom, Illinois State Board of Education, RSP # 13B170, April, 2013, $159,901.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431006, March, 2013, $225,000.

"Illinois Pathways Energy Learning Exchange Planning Grant," with William Hunter and Matt Aldeman, Illinois State Board of Education (Source: U.S. Department of Education), RSP # 13A007, December, 2012, $50,000.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431005, June 2011, amended March, 2012, $98,911.

"Wind for Schools Education and Outreach," with Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 11-025001, amended February, 2012, $111,752.

"A Proposal to Support Solar Energy Potential and Job Creation for the State of Illinois Focused on Large Scale Photovoltaic System," with Jin Jo (lead PI), Illinois Department of Commerce and Economic Opportunity, Award Number 12-025001, January 2012, $135,000.

"National Database of Utility Rates and Rate Structure," U.S. Department of Energy, Award Number DE-EE0005350TDD, 2011-2014, $850,000.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431005, June 2011, $75,000.

Grants (cont'd)

"Wind for Schools Education and Outreach," with Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 11-025001, March 2011, $190,818.

"Using Informal Science Education to Increase Public Knowledge of Wind Energy in Illinois," with Amy Bloom and Matt Aldeman, Scott Elliott Cross-Disciplinary Grant Program, February 2011, $13,713.

"Wind Turbine Market Research," with Matt Aldeman, Illinois Manufacturers Extension Center, May, 2010, $4,000.

"Petco Resource Assessment," with Matt Aldeman, Petco Petroleum Co., April, 2010 amended August 2010 $34,000; original amount $18,000.

"Wind for Schools Education and Outreach," with Anthony Lornbach and Matt Aldeman, Scott Elliott Cross-Disciplinary Grant Program, February, 2010, $13,635.

"IGA IFA/ISU Wind Due Diligence," Illinois Finance Authority, November, 2009, $8,580 amended December 2009; original amount $2,860.

"Green Industry Business Development Program, with the Shaw Group and Illinois Manufacturers Extension Center, Illinois Department of Commerce and Economic Opportunity, Award Number 09-021007, August 2009, $245,000.

"Wind Turbine Workshop Support," Illinois Department of Commerce and Economic Opportunity, June 2009, $14,900.

"Illinois Wind Workers Group," with Randy Winter, U.S. Department of Energy, Award Number DE-EE0000507, 2009-2011, $107,941.

"Wind Turbine Supply Chain Study," with J. Lon Carlson and James E. Payne, Illinois Department of Commerce and Economic Opportunity, Award Number 09-021003, April 2009, $125,000.

"Renewable Energy Team Travel to American Wind Energy Association WindPower 2009 Conference, Center for Mathematics, Science and Technology, February 2009, $3,005.

"Renewable Energy Educational Lab Equipment," with Randy Winter and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), February, 2008, $232,600.

Grants (cont'd)

"Proposal for New Certificate Program in Electricity, Natural Gas and Telecommunications Economics," with James E. Payne, Extended Learning Program Grant, April, 2007, $29,600.

"Illinois Broadband Mapping Study," with J. Lon Carlson and Rajeev Goel, Illinois Department of Commerce and Economic Opportunity, Award Number 06-205008, 2006-2007, $75,000.

"Illinois Wind Energy Education and Outreach Project," with David Kennell and Randy Winter, U.S. Department of Energy, Award Number DE-FG36-06GO86091, 2006-2010, $990,000.

"Wind Turbine Installation at Illinois State University Farm," with Doug Kingman and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), May, 2004, $500,000.

"Illinois State University Wind Measurement Project," Doug Kingman and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), with August, 2003, $40,000.

"Illinois State University Wind Measurement Project," with Doug Kingman and David Kennell, NEG Micon matching contribution, August, 2003, $65,000.

"Distance Learning Technology Program," Illinois State University Faculty Technology Support Services, Summer 2002, $3,000.

"Providing an Understanding of Telecommunications Technology By Incorporating Multimedia into Economics 235," Instructional Technology Development Grant (peer-reviewed), January 15, 2001, $1,400.

"Using Real Presenter to create a virtual tour of GTE's Central Office," with Jack Chizmar, Instructional Technology Literacy Mentoring Project Grant (peer-reviewed), January 15, 2001, $1,000.

"An Empirical Study of Telecommunications Industry Forecasting Practices," with James E. Cox, College of Business University Research Grant (peer-reviewed), Summer, 1999, $6,000.

"Ownership Form and the Efficiency of Electric Utilities: A Meta-Analytic Review" with L. Dean Hiebert, Institute for Regulatory Policy Studies research grant (peer-reviewed), August 1998, $6,000.

Total Grants: $7,740,953

External Funding

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Aqua Illinois ($7,500); Commonwealth Edison ($7,500); Exelon ($7,500); Illinois American Water ($7,500); Midcontinent ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2017, $67,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2017, $18,342.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Aqua Illinois ($7,500); Commonwealth Edison ($7,500); Exelon ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midcontinent ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2017, $75,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2016, $19,667.

Corporate Funding for Energy Learning Exchange, Calendar Year 2016, $53,000.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Aqua Illinois ($7,500); Commonwealth Edison ($7,500); Exelon/Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midcontinent ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Utilities, Inc. ($7,500) Fiscal Year 2016, $82,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2015, $15,897.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Alliance Pipeline ($7,500); Aqua Illinois ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Exelon/ Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midcontinent ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2015, $90,000 total.

Corporate Funding for Energy Learning Exchange, Calendar Year 2014, $55,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2014, $12,381.

External Funding (cont'd)

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Alliance Pipeline ($7,500); Aqua Illinois ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midwest Energy Efficiency Alliance ($4,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2014, $102,000 total.

Corporate Funding for Energy Learning Exchange, Calendar Year 2013, $53,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2013, $17,097.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren ($7,500), Alliance Pipeline ($7,500); Aqua Illinois ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2013, $97,500 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2012, $29,325.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2012, $16,060.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline ($7,500); Aqua Illinois ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2012, $90,000 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2011, $57,005.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2011, $13,562.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline ($7,500); Aqua Illinois ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); Illinois American Water ($7,500) ITC Holdings ($7,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2011, $90,000 total.

External Funding (cont'd)

Corporate Funding for Center for Renewable Energy, Calendar Year 2010, $50,000.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2010, $49,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2010, $17,759.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline ($7,500); Ameren ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); ITC Holdings ($7,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2010, $82,500 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2009, $57,140.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2009, $21,988.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline ($7,500); Ameren ($7,500); AT&T ($7,500);Commonwealth Edison ($7,500); Constellation NewEnergy ($7,500); MidAmerican Energy ($7,500); Midwest Generation ($7,500); MidWest ISO ($7,500); NICOR Energy ($7,500); People Gas Light and Coke ($7,500); PJM Interconnect ($7,500); Fiscal Year 2009, $82,500 total.

Corporate Funding for Center for Renewable Energy, Calendar Year 2008, $157,500.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2008, $38,500.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2008, $28,489.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline ($5,000); Ameren ($5,000); AT&T ($5,000);Commonwealth Edison ($5,000); Constellation NewEnergy ($5,000); MidAmerican Energy ($5,000); Midwest Generation ($5,000); MidWest ISO ($5,000); NICOR Energy ($5,000); Peabody Energy ($5,000), People Gas Light and Coke ($5,000); PJM Interconnect ($5,000); Fiscal Year 2008, $60,000 total.

External Funding (cont'd)

Corporate Funding for Illinois Wind Working Group, Calendar Year 2007, $16,250.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2007, $19,403.

Corporate Funding for Institute for Regulatory Policy Studies, AARP ($3,000), Alliance Pipeline ($5,000), Ameren ($5,000); Citizens Utility Board ($5,000); Commonwealth Edison ($5,000); Constellation NewEnergy ($5,000); MidAmerican Energy ($5,000); Midwest Generation ($5,000); MidWest ISO ($5,000); NICOR Energy ($5,000); Peabody Energy ($5,000), People Gas Light and Coke ($5,000); PJM Interconnect ($5,000); SBC ($5,000); Verizon ($5,000); Fiscal Year 2007, $73,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2006, $13,360.

Corporate Funding for Institute for Regulatory Policy Studies, AARP ($1,500), Alliance Pipeline ($2,500), Ameren ($5,000); Citizens Utility Board ($5,000); Commonwealth Edison ($5,000); Constellation NewEnergy ($5,000); DTE Energy ($5,000); MidAmerican Energy ($5,000); Midwest Generation ($5,000); MidWest ISO ($5,000); NICOR Energy ($5,000); Peabody Energy ($2,500), People Gas Light and Coke ($5,000); PJM Interconnect ($5,000); SBC ($5,000); Verizon ($5,000); Fiscal Year 2006, $71,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2005, $12,916.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); Citizens Utility Board ($5,000); Commonwealth Edison ($5,000); Constellation NewEnergy ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); Midwest Generation ($5,000); MidWest ISO ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); PJM Interconnect ($5,000); SBC ($2,500); Verizon ($2,500); Fiscal Year 2005, $60,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2004, $17,515.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); Commonwealth Edison ($5,000); Constellation NewEnergy ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); Midwest Generation ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); PJM Interconnect ($5,000); Fiscal Year 2004, $45,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2003, $8,300.

External Funding (cont'd)

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); AT&T ($2,500); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); Fiscal Year 2003, $32,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2002, $15,700.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($2,500); AT&T ($5,000); Commonwealth Edison ($2,500); Illinois Power ($2,500); MidAmerican Energy ($2,500); NICOR Energy ($2,500); People Gas Light and Coke ($2,500); Calendar Year 2002, $17,500 total.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates ($10,000); Taylor Nelson Sofres Telecoms ($10,000); Calendar Year 2002, $20,000 total

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); AT&T ($5,000); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); Calendar Year 2001, $35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2001, $19,400.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates ($10,000); Taylor Nelson Sofres Telecoms ($10,000); SAS Institute ($10,000); Calendar Year 2001, $30,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); AT&T ($5,000); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); Calendar Year 2000, $35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2000, $20,270.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates ($10,000); Taylor Nelson Sofres Telecoms ($10,000); Calendar Year 2000, $20,000 total.

External Funding (cont'd)

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); AT&T ($5,000); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); NICOR Energy ($5,000); People Gas Light and Coke ($5,000); Calendar Year 1999, $35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1999, $10,520.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates ($10,000); PNR Associates ($10,000); Calendar Year 1999, $20,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); CILCO ($5,000); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); People Gas Light and Coke ($5,000); Calendar Year 1998, $30,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1998, $44,334.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates ($10,000); PNR Associates ($10,000); Calendar Year 1998, $20,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS ($5,000); CILCO ($5,000); Commonwealth Edison ($5,000); Illinois Power ($5,000); MidAmerican Energy ($5,000); People Gas Light and Coke ($5,000); Calendar Year 1997, $30,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1997, $19,717.

Total External Funding: $2,492,397

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Economic Impact Analysis
of Coles Wind Project