

The Expected Economic Impact of a
220 MW Electric Generation Wind Farm
on Reno County, Kansas



Preston Gilson, Ph.D.
Senior Policy Fellow
Docking Institute of Public Affairs



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**FORT HAYS STATE
UNIVERSITY**

Docking Institute of Public Affairs
Fort Hays State University
600 Park Street
Hays, Kansas 67601-4099
Telephone: (785) 628-4197
FAX: (785) 628-4188
www.fhsu.edu/docking

Michael S. Walker, M.S.
Director
785-628-5563
mwalker@fhsu.edu

Jian Sun, Ph.D.
Assistant Director
785-628-4509
jsun@fhsu.edu

Luis Montelongo, M.B.A.
Research Coordinator
785-628-5571
ldmontelongo@fhsu.edu

Lynette Ottley
Administrative Specialist
785-628-5949
lrottley@fhsu.edu

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Prepared By:

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Executive Summary

- The likely area for the proposed wind farm lies within the unincorporated portion of Reno County which is projected to lose population at a 19.6% rate for the period 2017 through 2040.
- The Total Economic Impact of this proposed wind farm on the economy of Reno County is \$132,950,521.
- The Total Economic Impact to the Private Sector of Reno County from the Construction Phase is estimated to be \$3,885,000.
- The Total Economic Impact from the Construction Phase to the Public Sector in Reno County is estimated to be \$72,150.
- The Total Economic Impact to the Private Sector of Reno County during the 30-year Operational Phase is estimated to be \$97,403,491.
- The Total Economic Impact from the 30-year Operational Phase to the Public Sector in Reno County is estimated to be \$31,589,880.

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Introduction

The use of wind power to make life easier for Kansans began with the first settlers who used windmills to pump water. Soon windmills dotted the Kansas landscape providing water for people and livestock. More recently wind turbines have been developed to produce electricity.

This report focuses on the expected economic effects on Reno County that may result from the construction and operation of a 220 MW wind generation electricity production facility (wind farm) located in the southeastern part of the county. The construction phase of the project is a labor-intensive, short-term phase. The operational phase of the project is a long-term, capital-intensive phase. Each phase will be analyzed separately.

Methodology

The model used in this study is based on the work of Wassily Leontif. Leontif's input-output models attempt to quantify the interdependences between the various sectors of an economy. The model used for this analysis is the IMPLAN Software model. The IMPLAN software and its database calculate appropriate industry level multipliers at the county level or a multi-county regional level. The source data for this model comes from a wide variety of sources that are collected and published by the U.S. Government. Additional data, specific to this analysis, comes from the Reno County Comprehensive Plan and from NextEra Energy Resources (NEER).

How an economy responds to changes in economic activity can be quantified based on the buy-sell relationships among the economic agents (businesses, governmental entities, and households) located within the studied economy. Input-Output (I-O) models estimate the inter-industry relationships in an economy (or region) by measuring the distribution of inputs purchased and output sold by each industry. Through the use of I-O models, it is possible to calculate how the impact of one dollar flows or "ripples" through a regional economy. As this economic activity (measured by the dollar) flows through the economy, it causes additional economic activity (expenditures and employment). This is the multiplier effect: a quantitative measure of the ripple effects that an initial expenditure has on its economy.

The total economic impact on an economy is the sum of the initial economic activity, the Direct Impact, plus all of the secondary effects, the Multiplier Effect. The Multiplier Effect consists of the indirect effects that are the results of business-to-business transactions indirectly caused by the direct impact. Businesses initially benefiting from the direct effects will subsequently increase spending at other local businesses. The indirect effect is a measure of this increase in business-to-business activity. Induced effects are the results of increased personal income caused by both the direct and indirect effects. Businesses that experience increased revenue from the direct and indirect effects will then increase payroll expenditures by hiring more employees, raising salaries, or increasing payroll hours. Households will then increase spending at local businesses. The induced effect is a measure of the increase in household-to-business activity.

Analysis

Baseline Overview

We started with a baseline look at the economy of Reno County. The Gross Regional Product for Reno County is slightly more than \$2,375,000,000. The Shannon-Weaver Diversity Index of .715 indicates a relatively well-diversified economy with several strong sectors. Table 1 shows the top ten industry sectors by income. It also shows the employment levels for these sectors.

Table 1: Top Ten Industry Sectors by Income, Reno County

Sector Description	Income	Employment
Employment and payroll of local government, education	\$139,421,692	2,928
Offices of physicians	\$81,253,530	867
Wholesale trade	\$64,549,306	1,125
Employment and payroll of local government, non-education	\$52,842,793	1,084
Hospitals	\$45,444,444	749
Employment and payroll of state government, education	\$39,366,707	847
Management of companies and enterprises	\$37,850,292	712
Nursing and community care facilities	\$34,593,703	1,073
Farm machinery and equipment manufacturing	\$30,297,859	529
Monetary authorities and depository credit intermediation	\$27,927,106	479

Source: Implan Model

Table 2 (taken from the Reno County Comprehensive Plan), on the other hand, paints a somewhat pessimistic picture of the next 20 years. "Over the timeframe of this plan (2017 through 2040), the average population trend of all the communities in Reno County look to maintain a very gradual and consistent decline of approximately 10.6%, while the unincorporated portion of the County trending towards a 19.6% decrease based on a linear trend projection method."¹

Table 2: County Population Projections (2017 – 2040)

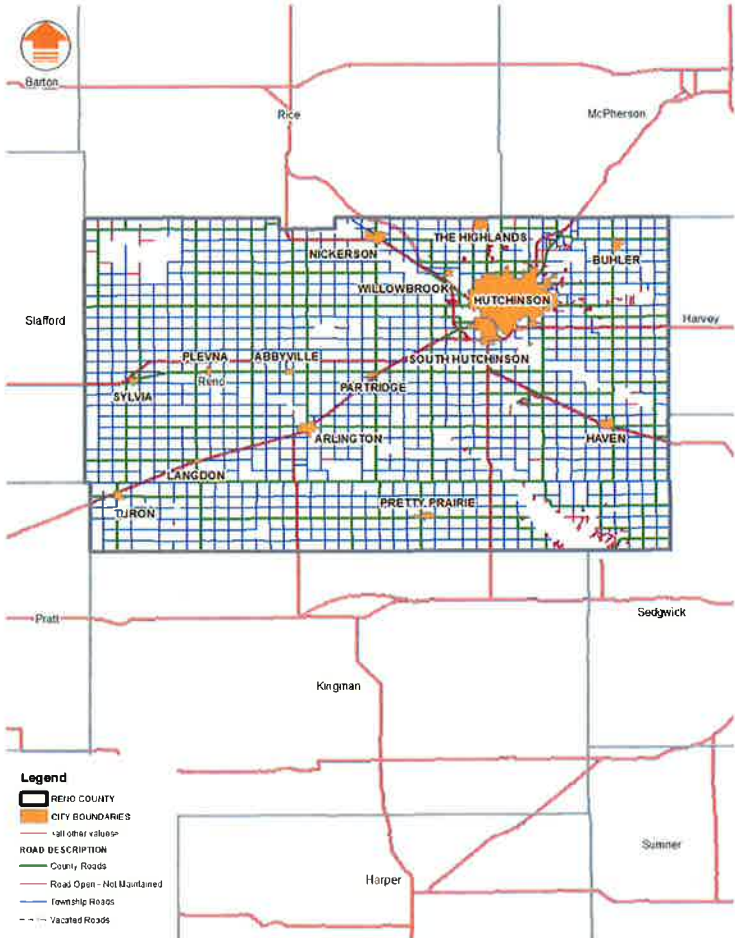
County	2017	2020	2030	2040	% Change 2017-2040
Reno	62,510	61,579	58,577	55,720	-10.90%

Source: Reno County, Kansas Comprehensive Plan November 13, 2018 page 33

¹ Reno County, Kansas Comprehensive Plan November 13, 2018 page 33.

Map 1 shows that most of the communities in Reno County are located on state or federal highways as shown in red. Areas that are not along these corridors are expected to lose population at a greater rate. The likely area for the proposed wind farm lies within this unincorporated portion of Reno County which is projected to lose population at a 19.6% rate for the period 2017 through 2040.

Map 1: Communities and Roads in Reno County



Source: Reno County, Kansas Comprehensive Plan November 13, 2018 page 40

Construction Phase

The construction phase is estimated to take between six and nine months. This analysis assumes that the construction phase will take 185 days. If there are delays and the construction takes longer, then the economic impact will be somewhat larger than shown in Tables 3 through 5.

Table 3 lays out the basic assumptions for the construction phase of this project. The payroll and number of workers are estimated by NEER. The number of construction days is the minimum number of days. The average daily spending is based on the GSA per diem rate for Kansas.

Table 3: Basic Assumptions Associated with the Construction Phase

Construction Payroll	\$8,437,500
Number of Construction Workers	250
Construction Days	185
Average Daily Spending	\$60

Table 4 shows the economic impacts to the private sector of the economy of Reno County. The Direct Economic Impact comes from the money spent by the construction workers to purchase basic daily necessities as reflected in the GSA per diem rate for Kansas. The analysis assumes that the remainder of the construction payroll (\$5,662,500) will not be spent in Reno County. The Indirect Economic Effects come from the additional spending that occurs between businesses due to the Direct Economic Impact. And, the Induced Economic Effects arise from the additional spending by the employees of the businesses that are affected by both the Direct and Indirect spending associated with the construction phase. When all of these are summed together the Total Economic Impact to the Private Sector of Reno County from the Construction Phase is estimated to be \$3,885,000.

Table 4: Economic Impact to the Private Sector, Construction Phase

Direct Economic Impact	\$2,775,000
Indirect Economic Effects	\$693,750
Induced Economic Effects	\$416,250
Total Economic Impact	\$3,885,000

Source: Implan Model

Table 5 shows the economic impact to the public sector of the economy of Reno County. Because of the transitory nature of the construction phase the analysis is limited to the per diem spending of these construction workers. This spending is subject to sales tax. Given the dominant role of businesses in Hutchinson relative to the other communities in Reno County the analysis assumes that the spending will occur in Hutchinson and be taxed by both the county and the city sales taxes. The additional sales tax for Reno County is estimated at \$41,625 and the additional sales tax for

Hutchinson is estimated at \$30,525. The total economic impact from the construction phase to the public sector in Reno County is estimated to be \$72,150.

Table 5: Economic Impact to the Public Sector, Construction Phase

Taxable Spending (Construction Workers)	\$2,775,000
Reno County Sales Tax	\$41,625
Hutchinson Sales Tax	\$30,525

Operational Phase

The operational phase is expected to last at least 30 years. Table 6 shows the projected assumptions for the operational phase of this project. The Operation Payroll includes an annual adjustment to reflect the expected long-term increase in wages.²

Table 6: Projected Assumptions Associated with the Operational Phase

Description	Total (30 years)
Operation Payroll	\$35,136,884
Operation Workers	17
Land Lease Payments	\$50,000,000
Payment to County in lieu of taxes	\$2,800,000
Property Taxes	\$27,000,000
Payment to School District	\$1,500,000

The lack of multipliers for Reno County wind farms is the result of not having any wind farms in the county. However, there are multipliers for the State of Kansas and for a similarly sized county with a comparable operating wind farm. The multipliers for the State of Kansas are larger than those for the comparison county (Butler County). The multipliers for the State of Kansas reflect both the much larger land area and the greater number of wind farms.

Butler County was used as the substitute source of Implan multipliers for several reasons. The demographic characteristics of the two counties are quite similar. Butler County is adjacent to Sedgwick County as is Reno County. Thus, both counties experience the same factors that draw businesses and citizens to the Wichita area. Both counties have well-developed rail and roadway transportation connections. There are comparable community colleges in each county. And, each county has extensive agricultural activities. Finally, the wind farm in Butler County is only slightly larger than the one proposed in Reno County. For all of these reasons the analysis uses the Butler County multipliers rather than those for the State of Kansas.

Table 7 shows the economic impacts to the private sector of the economy of Reno County during the 30-year operational phase of this project. The Direct Economic Impact comes from two sources: 1) the operational payroll and 2) the land lease payments to the landowners. The Indirect Economic Effects come from the additional spending that occurs between businesses due to the Direct Economic Impact. The Induced Economic Effects reflect the additional spending by the employees of those businesses that are affected by both the Direct Impact and the Indirect Effects during the operational phase. When all of these are summed together the Total Economic Impact to the Private Sector of Reno County during the 30-year operational phase is estimated to be \$97,403,491.

² The Average Wage Index. <https://www.ssa.gov/OACT/COLA/awidevelop.html>

Table 7: Economic Impact to the Private Sector, Operational Phase

Direct Economic Impact	\$85,136,884
Indirect Economic Effects	\$8,373,127
Induced Economic Effects	\$3,893,480
Total Economic Impact	\$97,403,491

Source: Implan Model

Table 8 shows the economic impact to the public sector of the economy of Reno County. The payment in lieu of taxes during the initial 10-year abatement period and the payment to the school district are estimated. The property tax estimate is for the remaining 20 years (11 through 30) and is based on current appraisal and tax procedures. Although the amounts associated with sales tax are minor, they do reflect some additional impact to the county from the spending of the operational workforce. The total economic impact from the 30-year operational phase to the public sector in Reno County is estimated to be \$31,589,880.

Table 8: Economic Impact to the Public Sector, Operational Phase

Payment to County in lieu of taxes	\$2,800,000
Property Taxes	\$27,000,000
Payment to School District	\$1,500,000
Reno County Sales Tax	\$173,928
Hutchinson Sales Tax	\$115,952

Findings

The likely area for the proposed wind farm lies within the unincorporated portion of Reno County which is projected to lose population at a 19.6% rate for the period 2017 through 2040.

The Total Economic Impact of this proposed wind farm on the economy of Reno County is \$132,950,521.

Construction Phase

The Total Economic Impact to the Private Sector of Reno County from the Construction Phase is estimated to be \$3,885,000.

The Total Economic Impact from the Construction Phase to the public sector in Reno County is estimated to be \$72,150.

Operational

The Total Economic Impact to the Private Sector of Reno County during the 30-year operational phase is estimated to be \$97,403,491, including an estimated \$50 million in land payments.

The Total Economic Impact from the 30-year operational phase to the public sector in Reno County is estimated to be \$31,589,880.

Return/Risk

The Total Economic Impact of this proposed wind farm on the public and private sectors of the Reno County economy exceeds \$90,000,000 in 2019 dollars.

The new predictable cash flows from this proposed wind farm increase the revenue streams (return) from the leased land for both the private sector and the public sector while reducing the variability of returns (risk) currently associated with that land.

Appendix

Present Value

The 30-year operational phase of this project means that the cash flows in the later years will have less value when viewed today. Present Value (PV) is a standard way of moving future cash flows to the present. Because the cash flows associated with this project are relatively risk free the 30-year Breakeven Inflation Rate³ developed by the Saint Louis Federal Reserve Bank was used as the discount rate. Table A1 shows the present value (2019) of the operational cash flows during the 30-year operating phase of this project.

Table A1: Present Value of Operational Cash Flows

Description	Total (30 years)	Present Value of Total
Operation Payroll	\$35,136,884	\$25,954,833
Land Lease Payments	\$50,000,000	\$37,793,518
Payment to County in lieu of taxes	\$2,800,000	\$2,590,012
Property Taxes	\$27,000,000	\$18,428,958
Payment to School District	\$1,500,000	\$1,133,806
Reno County Sales Tax	\$173,928	\$128,476
Hutchinson Sales Tax	\$115,952	\$85,651

Table A2 shows the Total Economic Impact of this proposed wind farm on the public and private sectors of the Reno County economy exceeds \$90,000,000 in 2019 dollars.

Table A2: Present Value of All Cash Flows

Construction Phase Total	\$3,957,150
Operational Phase Total	\$86,115,254
Total	\$90,072,404

Risk

Because the cash flows (land lease payments) to the landowners are determined by contract they are not subject to fluctuations that are typically associated with agriculture land. Crop and livestock commodity prices can change for many reasons that are beyond the control of the farmer/rancher. By having a second, low risk, source of cash flow, the affected landowners are better able to manage the timing of their sales and to weather adverse market conditions for crops and livestock. In essence the landowners will have a greater return and less risk from their land portfolio.

³ <https://fred.stlouisfed.org/series/T30YIEM>

In the same way, public entities can better plan for longer term projects when the appraised value of property is subject to only minor changes from one year to the next. The value of wind turbine equipment is fully depreciated for years 11 through 30 at 20% of its new cost. Additionally, commercial/industrial users of land have a predictably stable workforce as a general rule. In the case of a wind farm, because it is capital intensive, the increased demand for public services is very small relative to the tax revenue associated with the project.

In short, the new predictable cash flows from this proposed wind farm increase the revenue streams (return) from the leased land for both the private sector and the public sector while reducing the variability of returns (risk) currently associated with that land.

The following information is taken directly from the Reno County Comprehensive Plan. It reflects an awareness of the potential for wind turbine electricity generation within Reno County.

WIND RESOURCES IN RENO COUNTY

The national wind resource assessment of the United States was created for the U.S. Department of Energy in 1986 and is documented in the Wind Energy Resource Atlas of the United States, October 1986.

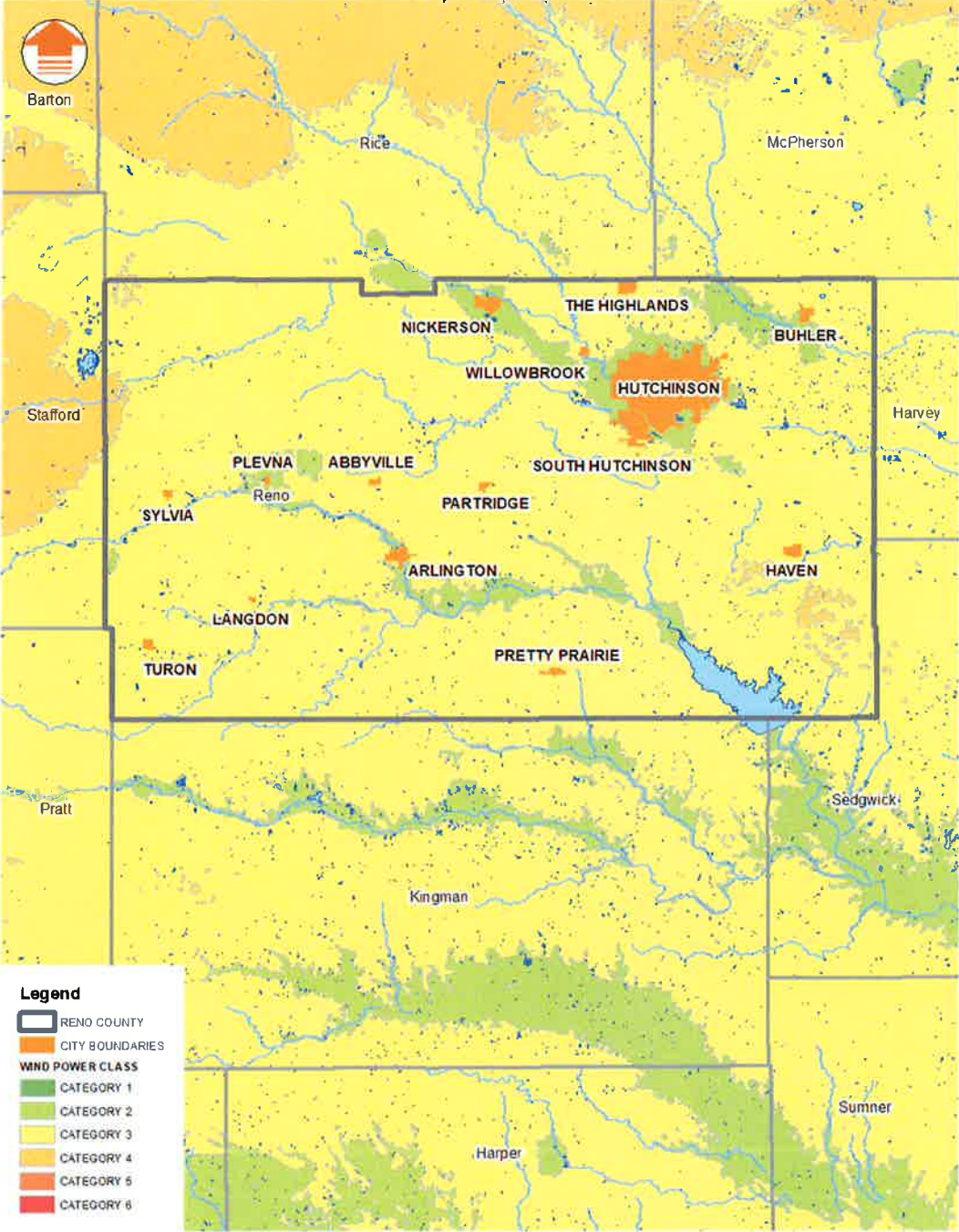
This wind resource assessment was based on surface wind data, coastal marine area data and upper-air data. The data was evaluated at a regional level to produce 12 regional wind resource assessments. The regional assessments were then incorporated into the national wind resource assessment.

The assigned “wind power class” is representative of the range of wind power densities likely to occur at exposed sites within any geographic area. Hilltops, ridge crests, large clearings, and other locations free of local obstruction to the wind are expected to be well exposed to the wind. In contrast, locations in narrow valleys and canyons, downwind slopes of hills or obstructions, or in forested or urban areas are likely to have poor wind exposure.

Areas designated Class 3 or greater are suitable for most utility-scale wind turbine applications, whereas Class 2 areas are marginal for utility-scale applications, but may be suitable for rural applications. Class 1 areas are generally not suitable, although a few locations (e.g., exposed hilltops not shown on the maps) with adequate wind resource for wind turbine applications may exist in some Class 1 areas. The degree of certainty with which the wind power class can be specified depends on three factors: the abundance and quality of wind data; the complexity of the terrain; and the geographical variability of the resource. A certainty rating was assigned to each grid cell based on these three factors, and is included in the Wind Energy Resource Atlas of the United States. Figure 24 (designated Map 2 on the following page) shows the wind power class designations currently found within Reno County.⁴

⁴ Reno County, Kansas Comprehensive Plan November 13, 2018 page 29

Map 2: Wind Power Class, Reno County



Source: Reno County, Kansas Comprehensive Plan November 13, 2018 page 30

End of Report

