

THE IMPACT OF THE MAMMOTH SOLAR & MOSS CREEK SOLAR PROJECTS IN PULASKI COUNTY, INDIANA

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PURPOSE & LIMITATIONS

This report presents the results of an analysis undertaken by Impact DataSource, an Austin, TX based economic consulting firm.

The analysis relies on information about Mammoth Solar & Moss Creek Solar as well as estimates, assumptions, and other information developed by Impact DataSource from its independent research effort.

Our analysis quantifies the economic impact of the Mammoth Solar & Moss Creek Solar as described throughout this report.

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Study Highlights

- The purpose of the analysis is to estimate the economic impact of the Mammoth Solar & Moss Creek Solar projects on the Pulaski County economy as well as estimate the associated negative economic impact for farmers and suppliers related to 10,819 acres of farmland being converted to solar use.

Solar Construction/Installation Impact

- The development of the Mammoth Solar & Moss Creek Solar projects will include a 36-month development period where \$1.3 billion will be spent to install the two solar projects. The solar developers anticipate investing:
 - Equipment: \$763.7 million
 - Onsite labor: \$381.8 million
 - Onsite materials: \$25.5 million
 - Other: \$101.8 million
- Approximately 60% of the total investment will be spent on equipment that will be purchased outside of Pulaski County. However, local spending on labor, materials, and other services is estimated to total \$112.0 million.

Total Local Construction Impacts

- \$141.6 million in economic impact over the 36-month period.
- 1,823 total construction jobs years of employment during construction.
- \$107.5 million in total workers' earnings paid to construction workers during this period.

Solar Operation Impact

- Once operational, the solar projects are expected to employ 20 workers earning an average of \$69,600 per year.

Total On-going Impacts

- \$98.1 million annual economic impact.
- 51 total permanent jobs created.
 - For every 1 solar job in the county, 1.6 additional jobs are created in the form of indirect and induced employment elsewhere in Pulaski County.
- \$2,195,000 in total annual workers' earnings.
- \$5.3 million in annual land rent payments to Pulaski County residents.

Loss in Farmland Impact

- The Mammoth Solar & Moss Creek Solar projects will reduce the available farmland in Pulaski County and reduce farm output by an estimated \$9.5 million per year. This analysis estimates the total economic impact of this reduction in farm output to calculate the additional negative impact that may be felt by suppliers and other businesses in the county.

Total Loss in Farmland Impact

- \$13.0 million in annual economic impact.
- 77 total permanent jobs.
- \$2.1 million in total annual workers' earnings.
- \$1.2 million in annual land rent payments to Pulaski County residents.

Indirect and induced impacts represent the spin-off economic activity resulting from the business-to-business expenditures initiated by the company and the consumer-to-business expenditures initiated by workers spending a portion of their earnings on goods and services in the economy. **Economic output** is gross output and is the sum of the intermediate inputs and final use. This is a duplicative total in that goods and services will be counted multiple times if they are used in the production of other goods and services. Economic output can be thought of as the value of goods and services sold in the economy or revenues for businesses in the economy. **Value added** is defined as the value of gross output less intermediate inputs. **Worker's earnings** or household earnings consist of wages and salaries, employer provided benefits, and proprietors' income. For permanent or on-going activity, **Employment** consists of a count of jobs that include both full-time and part-time workers. For temporary construction impacts, a **Job Year** is defined as full employment for one person for 2080 hours in a 12-month span.

Study Highlights - Continued

Overall Comparison

Based on the analysis contained in this report and summarized in Table 1, the following comparisons can be made:

- Solar Use will result in a loss of approximately 26 jobs and \$91,000 in workers' earnings.
- Solar Use workers will earn more than Farm Use workers on average.
 - The average salary for direct Solar Use jobs is 3 times greater than Farm Use job pay.
- Solar Use jobs support a greater number of indirect and induced workers per direct job.
 - Solar Use employment supports 1.6 jobs per direct worker while Farm Use employment supports 0.4 jobs per direct worker.
- Solar Use will result in an increase in total economic output of \$85.1 million.
 - The direct economic output for Solar Use is 8.1 times greater than the direct economic output of Farm Use.
- Solar Use will result in a \$4.1 million increase in land rent paid to Pulaski County residents.
 - The land rent paid to local residents for Solar Use is 4.5 times greater than the rent paid for Farm Use.
- Solar Use will increase value added by \$51.8 million, which is to say, the county's economy will increase by \$51.8 million.
 - Solar Use will result in a net increase in the county's economy of 7.6 percent.

Table 1. Comparison of Total Annual Economic Impact of Solar Use vs. Farm Use

	Annual Solar Use Impact	Annual Farm Use Impact	Difference
Jobs:			
Direct	20.0	57.1	(37.1)
Indirect & Induced	31.4	20.1	11.2
<u>Total Jobs</u>	<u>51.4</u>	<u>77.2</u>	<u>(25.9)</u>
Workers' Earnings:			
Direct	\$1,392,000	\$1,311,566	\$80,434
Indirect & Induced	\$803,462	\$793,104	\$10,358
<u>Total Workers' Earnings</u>	<u>\$2,195,462</u>	<u>\$2,104,670</u>	<u>\$90,792</u>
Economic Output:			
Direct	\$76,852,111	\$9,506,189	\$67,345,922
Indirect & Induced	\$21,218,868	\$3,501,129	\$17,717,739
<u>Total Economic Output</u>	<u>\$98,070,979</u>	<u>\$13,007,318</u>	<u>\$85,063,661</u>
Value Added:			
<u>Total Value Added</u>	<u>\$57,185,656</u>	<u>\$5,361,490</u>	<u>\$51,824,165</u>
Land Rent:			
<u>Total Rent Paid</u>	<u>\$9,737,100</u>	<u>\$2,163,800</u>	<u>\$7,573,300</u>
<u>Rent Paid to Pulaski Residents</u>	<u>\$5,316,457</u>	<u>\$1,181,435</u>	<u>\$4,135,022</u>

Note: Solar Use will include a one-time construction impact of \$141.6 million not reflected in the table above.

Overview

This report presents the results of an economic impact analysis performed by Impact DataSource, an Austin, Texas economic consulting firm that specializes in economic and fiscal impact analysis. The purpose of the analysis is to estimate the economic impact of the Mammoth Solar & Moss Creek Solar projects on the Pulaski County economy as well as estimate the associated negative economic impact for farmers and suppliers related to the farmland being converted to solar use.

Methodology

Impact DataSource estimated the total impact of the Mammoth Solar & Moss Creek Solar using the project details and an economic impact model. The economic impact estimates in this report are based on the Regional Input-Output Modeling System (RIMS II), a widely used regional input-output model developed by the U. S. Department of Commerce, Bureau of Economic Analysis. The RIMS II model is a standard tool used to estimate regional economic impacts. The economic impacts estimated using the RIMS II model are generally recognized as reasonable and plausible assuming the data input into the model is accurate or based on reasonable assumptions. Additional detail on the RIMS II model is provided in the Appendix of this report.

Construction Impact Methodology

The economic impact of the construction of Mammoth Solar & Moss Creek Solar was estimated using the projected local expenditures and calculations prepared by Impact DataSource utilizing the RIMS II input-output model.

The solar developers provided estimates of total spending and how much of the total expenditure will take place in Pulaski County. As shown in the table below, the two projects are expected to represent a \$1.3 billion investment with \$112.0 million spent within Pulaski County. The Pulaski County construction expenditures represent the direct spending and are used to estimate the total impact in the county.

Table 2. Projected Development Expenditures for Mammoth Solar & Moss Creek Solar

	Percent of Total Expenditure	Total Expenditure	Percent of Total Expenditure Spent within Pulaski County	Total Expenditure Spent within Pulaski County
Equipment	60.0%	\$763,683,154	0.0%	\$0
Onsite labor	30.0%	\$381,841,577	25.0%	\$95,460,394
Onsite materials	2.0%	\$25,456,105	25.0%	\$6,364,026
Other	8.0%	\$101,824,421	10.0%	\$10,182,442
Total	100.0%	\$1,272,805,257		\$112,006,863

Operations Impact Methodology

The economic impact of Mammoth Solar & Moss Creek Solar operations was estimated using the projected output, employment, and workers' earnings data provided by the solar developers and calculations prepared by Impact DataSource utilizing the RIMS II input-output model.

According to information provided by the solar developers, the projects will employ a total of 20 workers. On average these workers will earn \$69,600 annually. The direct economic output associated with the two solar projects is expected to be \$76.9 million per year.

Table 3. Projected Output, Employment, and Workers' Earnings for Mammoth Solar & Moss Creek Solar

Economic Output	\$76,852,111
Employees	20.0
Average Salary	\$69,600
Total Payroll	\$1,392,000

Reduction in Farming Activity

The negative economic impact associated with the farmland being converted to solar use is also calculated in this study. The negative impact is estimated to include the reduction in direct farm revenues as well as the reduction in indirect supplier revenues and the reduction in worker spending elsewhere throughout the county.

Impact DataSource relies on data from the United States Department of Agriculture (USDA) to estimate the amount of revenue per acre generated by farmland in Pulaski County. The total loss in farm revenue is estimated based on the per-acre metric and the number of total acres converted to solar use. The total economic impact is then estimated by applying the RIMS II input-output model.

Table 4. Estimated Reduction in Farm Output

<i>Farm Acres converted to Solar Use</i>	10,819
<i>Farm Revenue/ Ag Sales per acre*</i>	\$879
Total Reduction in Farm Revenue	\$9,506,189

* 2017 Census of Agriculture Data, USDA National Agricultural Statistics Service

Economic Impacts Defined

The economic impacts are measured in common measures of economic activity including employment, workers' earnings, economic output, and value added. Employment consists of a count of jobs that include both full-time and part-time workers. Workers' earnings consist of wages and salaries, employer-provided benefits, and proprietors' income. Economic output is gross output and is the sum of the intermediate inputs and final use. This is a duplicative total in that goods and services will be counted multiple times if they are used in the production of other goods and services. Economic output can be thought of as the value of goods and services sold in the economy or revenues for businesses in the economy. Value added is defined as the value of gross output less intermediate inputs and represents the contribution to gross area product or the size of the economy.

Direct Economic Impacts

Direct spending, direct employment, and direct salaries serve as the basis for the economic impact calculations in this impact analysis.

Spin-off Economic Impacts

The total economic impact supported by the company includes the direct as well as spin-off activity. The company's direct economic activity ripples through the economy and supports spin-off economic activity in the form of indirect and induced impacts. Indirect impacts reflect economic activity resulting from the business-to-business expenditures initiated by the company. Induced impacts refer to the consumer-to-business expenditures initiated by workers that spend a portion of their earnings on goods and services in the economy.

Rent Payments for Solar vs. Farm Use

In addition the specific economic impacts calculated for the activities described above, project developers have provided additional detail on specific rent payments to be paid to property owners. The solar developers will pay land owners approximately \$900 per acre in rent for the use of the land whereas land owners typically receive approximately \$200 per in rent for the use of the land for agriculture purposes.

Table 5. Land Rent Payments

Farm Acres converted to Solar Use		10,819
Rent Paid Per Acre for Solar Use	\$900 per acre	\$9,737,100
Rent Paid Per Acre for Farm Use	\$200 per acre	\$2,163,800
<u>Increase in Rent Payments</u>		<u>\$7,573,300</u>
Percent of Land Owners Residing in Pulaski County		54.6%
<u>Increase in Rent Payments to Pulaski County Residents</u>		<u>\$4,135,022</u>

The lease payments represent income to resident land owners in Pulaski County. According to Pulaski County, resident owners represent approximately 55% of the total acres contemplated to be used by the solar projects. Ultimately, Pulaski County residents will receive \$4.1 million more in rent payments as a result of the solar projects.

Solar Construction Impact

The project will include a 36-month development period where \$1.3 billion will be spent to install the two solar projects. The solar developers anticipate spending \$763.7 million on equipment, \$381.8 million on onsite labor, \$25.5 million on onsite materials, and \$101.8 million on other services.

Approximately 60.0% of the total investment will be spent on equipment that will be purchased outside of Pulaski County. However, local spending on labor, materials, and other services is estimated to total \$112.0 million.

Table 6. Projected Development Expenditures for Mammoth Solar & Moss Creek Solar

	Percent of Total Expenditure	Total Expenditure	Percent of Total Expenditure Spent within Pulaski County	Total Expenditure Spent within Pulaski County
Equipment	60.0%	\$763,683,154	0.0%	\$0
Onsite labor	30.0%	\$381,841,577	25.0%	\$95,460,394
Onsite materials	2.0%	\$25,456,105	25.0%	\$6,364,026
Other	8.0%	\$101,824,421	10.0%	\$10,182,442
Total	100.0%	\$1,272,805,257		\$112,006,863

This direct activity is expected to support 1,565 "job years" of employment and \$95.5 million in household earnings for these workers. A "job year" is defined as full employment for one person for 2080 hours in a 12-month span.

Table 7. Direct Construction Employment Supported

	Amount
Total Local Construction Expenditure	\$112,006,863
<i>Labor</i>	<i>\$95,460,394</i>
Total Job Years of Employment Supported (Average Earnings = \$61,000)	1,564.9
<i>Average Annual Job Years of Employment (3-Year Construction Period)</i>	<i>521.6</i>

In total, the solar installation is expected to support 1,823 "job years" of employment and \$107.5 million in household earnings for these workers when including the indirect and induced economic effects. Additionally, the activity will support \$141.6 million in total spending or economic output, and contribute \$78.7 million in value added or gross area product.

Table 8. Economic Impact of Construction

	Annual Impact	Total Impact
Jobs:		
Direct	521.6	1,564.9
Indirect & Induced	86.1	258.2
	<u>Total Jobs</u>	<u>607.7</u>
Workers' Earnings:		
Direct	\$31,820,131	\$95,460,394
Indirect & Induced	\$4,002,973	\$12,008,918
	<u>Total Workers' Earnings</u>	<u>\$35,823,104</u>
Economic Output:		
Direct	\$37,335,621	\$112,006,863
Indirect & Induced	\$9,852,870	\$29,558,611
	<u>Total Economic Output</u>	<u>\$47,188,491</u>
Value Added:		
	<u>Total Value Added</u>	<u>\$26,243,208</u>

Solar Operations Impact

Mammoth Solar & Moss Creek Solar is projected to create 20 direct jobs, \$1.4 million in workers' earning each year, and \$76.9 millior in economic output or sales. The total economic impact of the project, including the indirect and induced activity, is summarized below. In short, the operations are expected to support 51 jobs, \$2.2 million in workers' earnings and \$98.1 million in spending (or economic output) annually.

Table 9. Total Annual Economic Impact of Mammoth Solar & Moss Creek Solar

	Annual Impact
Jobs:	
Direct	20.0
Indirect & Induced	31.4
	<u>Total Jobs</u> <u>51.4</u>
Workers' Earnings:	
Direct	\$1,392,000
Indirect & Induced	\$803,462
	<u>Total Workers' Earnings</u> <u>\$2,195,462</u>
Economic Output:	
Direct	\$76,852,111
Indirect & Induced	\$21,218,868
	<u>Total Economic Output</u> <u>\$98,070,979</u>
Value Added:	
	<u>Total Value Added</u> <u>\$57,185,656</u>
Land Rent:	
	<i>Total Rent Paid</i> \$9,737,100
	<u>Rent Paid to Pulaski Residents</u> <u>\$5,316,457</u>

The solar projects are expected to employ 20.0 individuals directly and this activity is estimated to support another 31.4 spin-off jobs in the form of indirect and induced workers in the county economy. In total, the employment impact is estimated to be 51 jobs. This activity is expected to support 1.6 additional jobs elsewhere throughout the county for every direct job.

Direct workers are estimated to have earnings of \$1,392,000 and is expected to support an additional \$803,000 in earnings for workers in related spin-off jobs. Therefore, total workers' earnings supported by the operations is estimated to be \$2,195,000 per year.

The direct output associated with this activity is projected to be \$76.9 million and the indirect and induced spending or economic output is estimated to be \$21.2 million annually.

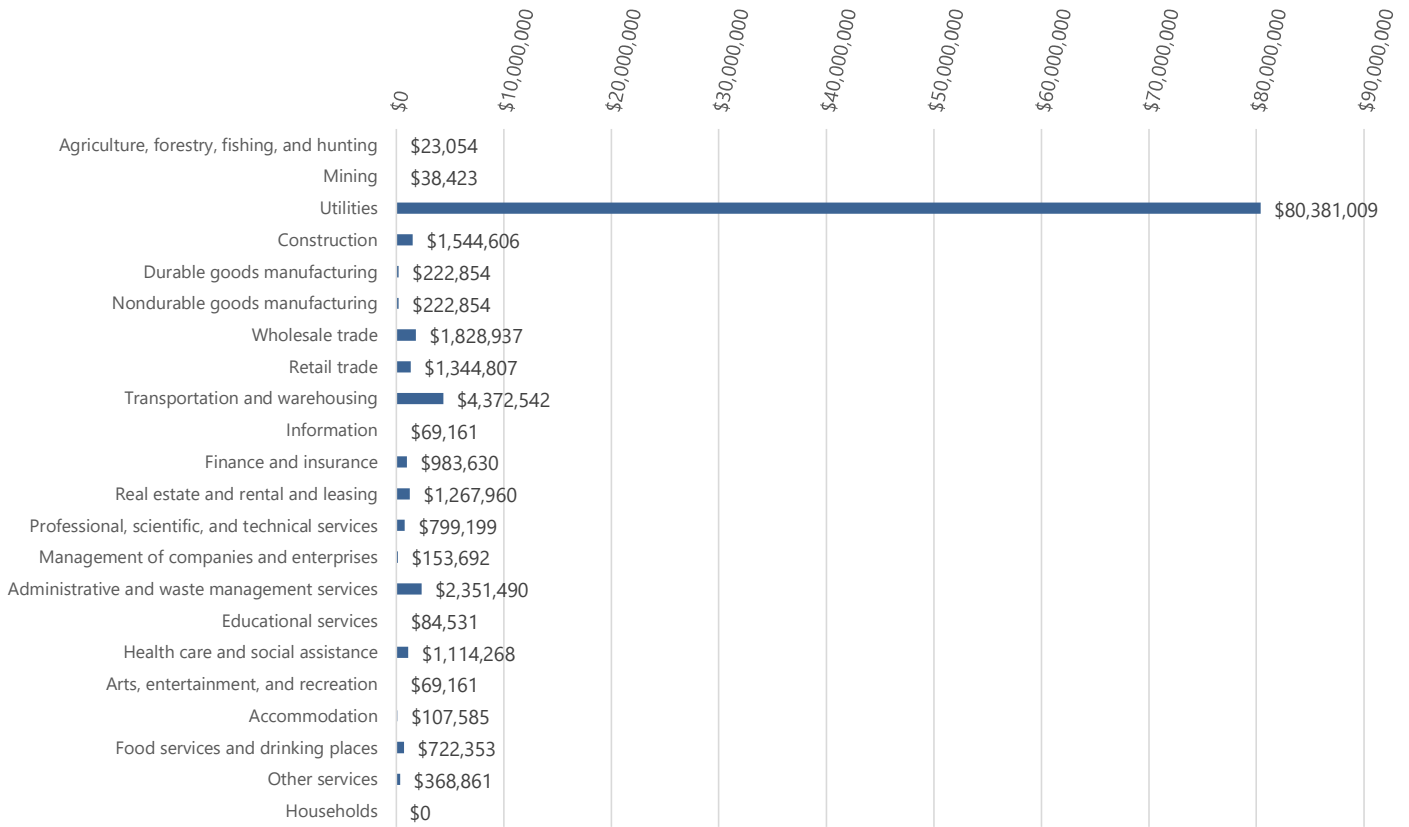
The table below illustrates the overall economic impact of Mammoth Solar & Moss Creek Solar by industry sector.

Table 10. Total Economic Impact by Industry Sector

	Employment	Household Earnings	Economic Output	Value Added
Agriculture, forestry, fishing, and hunting	0.1	\$1,785	\$23,054	\$7,687
Mining	0.0	\$1,785	\$38,423	\$15,375
Utilities	21.0	\$1,454,717	\$80,381,009	\$46,700,210
Construction	1.3	\$42,838	\$1,544,606	\$661,106
Durable goods manufacturing	0.1	\$5,355	\$222,854	\$76,873
Nondurable goods manufacturing	0.2	\$5,355	\$222,854	\$84,560
Wholesale trade	1.1	\$48,193	\$1,828,937	\$1,099,281
Retail trade	3.5	\$57,118	\$1,344,807	\$868,662
Transportation and warehousing	2.9	\$121,375	\$4,372,542	\$2,306,183
Information	0.1	\$3,570	\$69,161	\$38,436
Finance and insurance	1.1	\$37,484	\$983,630	\$630,357
Real estate and rental and leasing	1.8	\$32,129	\$1,267,960	\$930,161
Professional, scientific, and technical services	1.4	\$57,118	\$799,199	\$538,109
Management of companies and enterprises	0.3	\$16,064	\$153,692	\$99,935
Administrative and waste management services	9.5	\$173,138	\$2,351,490	\$1,675,826
Educational services	0.5	\$7,140	\$84,531	\$53,811
Health care and social assistance	2.2	\$67,827	\$1,114,268	\$676,480
Arts, entertainment, and recreation	0.3	\$3,570	\$69,161	\$38,436
Accommodation	0.2	\$3,570	\$107,585	\$61,498
Food services and drinking places	2.1	\$24,989	\$722,353	\$392,051
Other services	1.4	\$28,559	\$368,861	\$222,931
Households	0.3	\$1,785	\$0	\$7,687
Total	51.4	\$2,195,462	\$98,070,979	\$57,185,656

The following chart presents a graphical illustration of the total employment impact by sector. In total, the company supports \$98.1 million in output. Not surprisingly, the "Utilities" sector accounts for approximately 82% of this activity.

Total Economic Output Impact by Industry Sector



Impact of Loss of Farmland

The Mammoth Solar & Moss Creek Solar projects will convert 10,819 acres from farm use to solar use and it is projected to result in a reduction in direct farm output of \$9.5 million per year.

To estimate this reduction in farm output, Impact DataSource relied on data from the USDA Census of Agriculture. The 2017 Census of Agriculture reports \$188.2 million of agriculture products produced in Pulaski County. After applying a annual inflation of two percent per year, the value of products produced in 2021 is estimated to be \$203.7 million. Pulaski County contains 231,880 farm acres of land resulting in a metric of \$879 of agricultural product sales per acre. The reduction in direct farm output is obtained by applying the per-acre metric to the number of total farm acres converted to solar use.

Table 12. Estimate Reduction in Farm Output

Farm Acres converted to Solar Use	10,819
Market Value of Ag Products Sold (2017)	188,227,000
Market Value of Ag Products Sold (2021)	203,742,958
Total Farm Acres in Pulaski County	231,880
Agricultural Product Sales per Acre	\$879
Total Reduction in Farm Revenue	\$9,506,189

* 2017 Census of Agriculture Data, USDA National Agricultural Statistics Service

The total economic impact associated with the loss in farmland, including the indirect and induced activity, is summarized below. In short, the economic impact of the loss of farmland includes 77 jobs, \$2.1 million in workers' earnings and \$13.0 million in spending (or economic output) annually.

Table 13. Economic Impact of the Loss of Farmland

	Annual Impact
Jobs:	
Direct	57.1
Indirect & Induced	20.1
	<u>Total Jobs</u> <u>77.2</u>
Workers' Earnings:	
Direct	\$1,311,566
Indirect & Induced	\$793,104
	<u>Total Workers' Earnings</u> <u>\$2,104,670</u>
Economic Output:	
Direct	\$9,506,189
Indirect & Induced	\$3,501,129
	<u>Total Economic Output</u> <u>\$13,007,318</u>
Value Added:	
	<u>Total Value Added</u> <u>\$5,361,490</u>
Land Rent:	
	<i>Total Rent Paid</i> <i>\$2,163,800</i>
	<u>Rent Paid to Pulaski Residents</u> <u>\$1,181,435</u>

The total economic impact includes the reduction in direct farm revenues as well as the reduction in indirect supplier revenues and the reduction in worker spending elsewhere throughout the county.

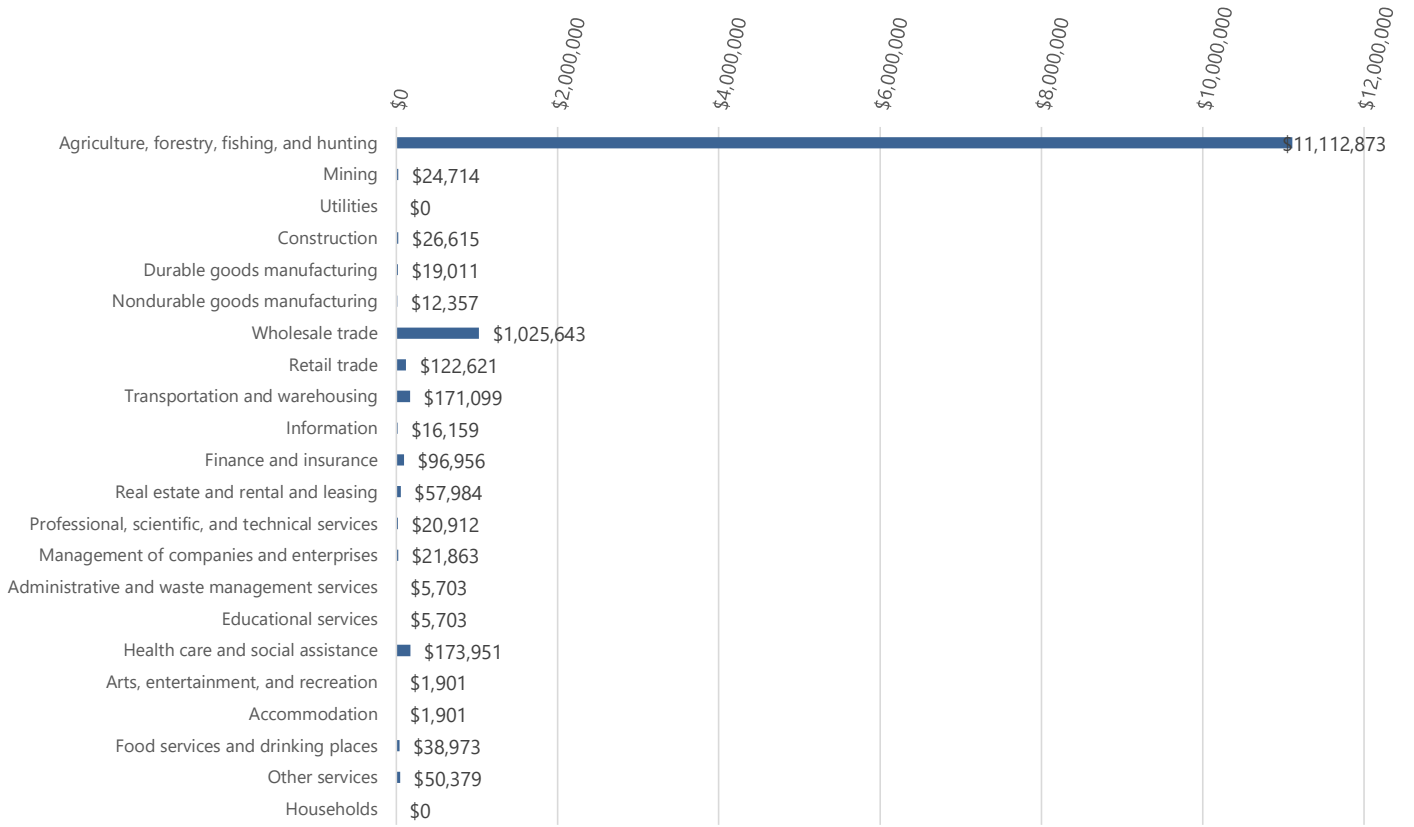
The table below illustrates the economic impact of the loss of farmland by industry sector.

Table 14. Total Economic Impact by Industry Sector

	Employment	Household Earnings	Economic Output	Value Added
Agriculture, forestry, fishing, and hunting	69.9	\$1,713,789	\$11,112,873	\$4,247,365
Mining	0.0	\$1,902	\$24,714	\$13,309
Utilities	0.0	\$0	\$0	\$0
Construction	0.2	\$10,462	\$26,615	\$13,309
Durable goods manufacturing	0.0	\$2,853	\$19,011	\$6,654
Nondurable goods manufacturing	0.0	\$1,902	\$12,357	\$4,753
Wholesale trade	2.2	\$165,482	\$1,025,643	\$617,902
Retail trade	1.2	\$37,091	\$122,621	\$80,803
Transportation and warehousing	0.9	\$51,357	\$171,099	\$75,099
Information	0.0	\$2,853	\$16,159	\$8,556
Finance and insurance	0.2	\$15,217	\$96,956	\$62,741
Real estate and rental and leasing	0.3	\$9,510	\$57,984	\$42,778
Professional, scientific, and technical services	0.2	\$10,462	\$20,912	\$13,309
Management of companies and enterprises	0.1	\$10,462	\$21,863	\$14,259
Administrative and waste management services	0.0	\$951	\$5,703	\$3,802
Educational services	0.1	\$2,853	\$5,703	\$3,802
Health care and social assistance	0.8	\$44,699	\$173,951	\$101,716
Arts, entertainment, and recreation	0.0	\$0	\$1,901	\$951
Accommodation	0.0	\$0	\$1,901	\$951
Food services and drinking places	0.4	\$8,559	\$38,973	\$19,963
Other services	0.3	\$12,364	\$50,379	\$27,568
Households	0.2	\$1,902	\$0	\$1,901
Total	77.2	\$2,104,670	\$13,007,318	\$5,361,490

The following chart presents a graphical illustration of the total employment impact by sector. In total, the farmland supports \$13.0 million of output. In this case, 85% of the output is within the "Agriculture, forestry, fishing, and hunting" sector.

Total Economic Output Impact by Industry Sector



Pulaski County Economy

This section provides additional context to the county's economy and the project under consideration. The data contained in this section was created by Emsi from their Q4 2021 Data Set for Pulaski County.

Economy Overview

12,388

Population (2020)

Population **decreased by 413** over the last 5 years and is projected to **decrease by 256** over the next 5 years.

5,603

Total Regional Employment

Jobs **grew by 281** over the last 5 years and are projected to **grow by 436** over the next 5 years.

\$49.6K

Median Household Income (2019)

Median household income is **\$13.3K below** the national median household income of \$62.8K.

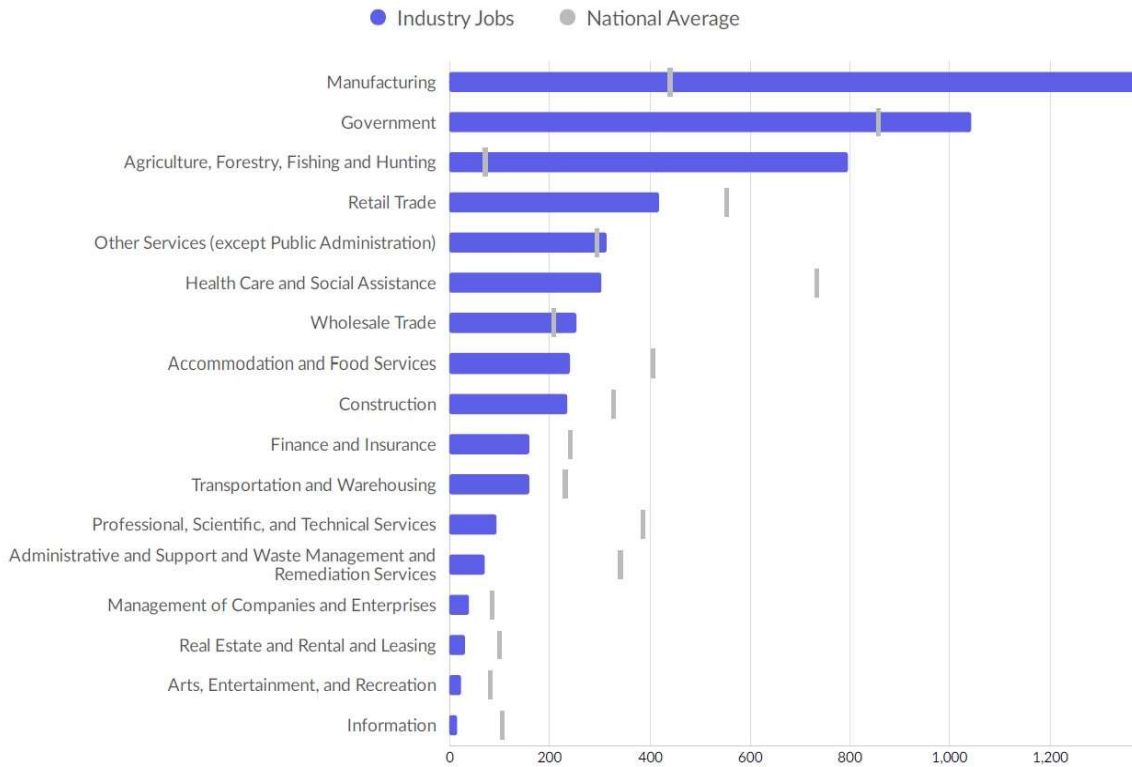
Takeaways

- As of 2020 the region's population **declined by 3.2%** since 2015, falling by 413. Population is expected to **decrease by 2.1%** between 2020 and 2025, losing 256.
- From 2015 to 2020, jobs **increased by 5.3%** in Pulaski County, IN from 5,322 to **5,603**. This change **outpaced the national growth rate of 0.0% by 5.3%**. As the number of jobs increased, the **labor force participation rate increased from 61.5% to 64.7% between 2015 and 2020**.
- Concerning educational attainment, **9.6% of Pulaski County, IN residents possess a Bachelor's Degree** (10.4% below the national average), and **8.5% hold an Associate's Degree** (0.1% below the national average).
- The top three industries in 2020 are Education and Hospitals (Local Government), Motor Vehicle Parts Manufacturing, and Animal Production.

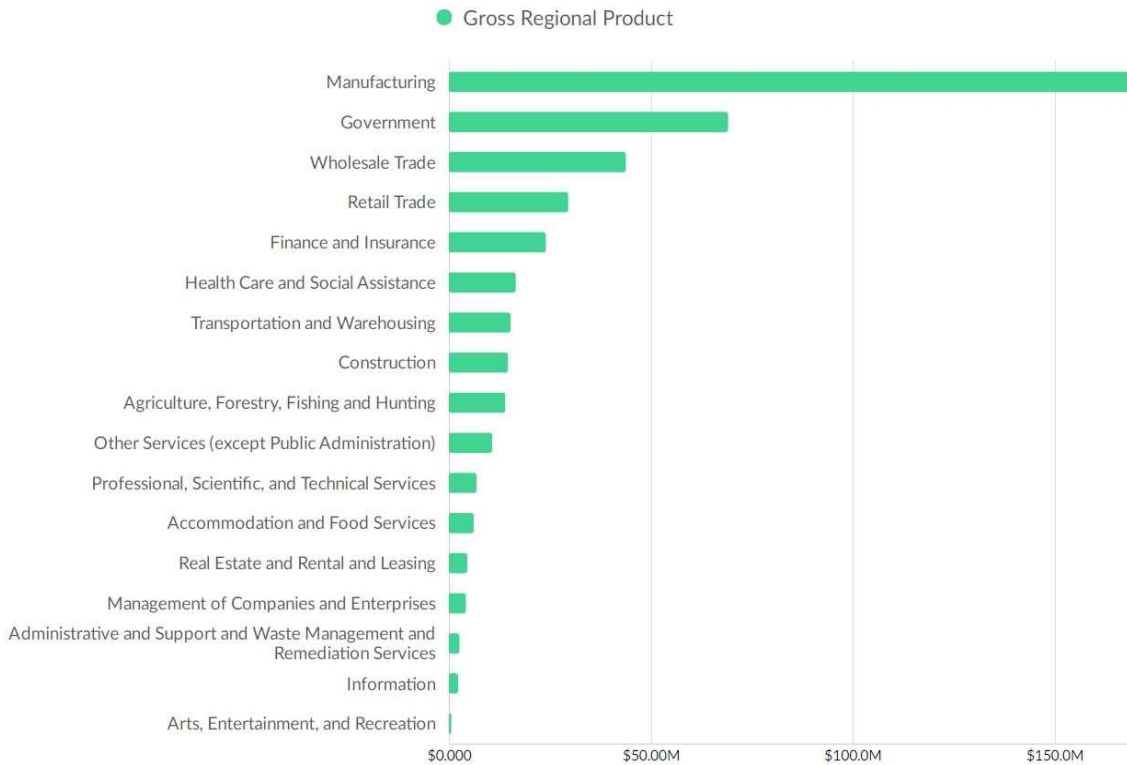


The Emsi Economy Overview also provides information on employment and Gross Regional Product (GRP) in Pulaski County. Gross Regional Product measures the final market value of all goods and services produced in the county. As shown on the next page, Manufacturing is the largest industry sector by employment and Gross Regional Product (GRP) in Pulaski County. Agriculture, Forestry, Fishing and Hunting is the second largest industry sector by employment and the ninth largest sector by GRP. Currently, the Utilities industry sector does not exist or is not large enough to register in the breakouts.

Largest Industries



Top Industry GRP



Unemployment Rate Trends

Pulaski County, IN had a September 2021 unemployment rate of 2.99%, decreasing from 4.41% 5 years before.



Timeframe	Unemployment Rate
2016	4.41%
2017	3.44%
2018	3.04%
2019	2.97%
2020	6.07%
January - June 2021	3.95%
July 2021	3.49%
August 2021	3.28%
September 2021	2.99%

Overview of Methodology

This report presents the results of an analysis undertaken by Impact DataSource, an Austin, TX based economic consulting firm.

Economic impacts can be categorized into two main types of impacts. First, the direct economic impacts are the jobs and payroll directly created by the company. Second, this economic impact analysis calculates the indirect and induced impacts that result from the facility. Indirect jobs and salaries are created in new or existing area firms, such as maintenance companies and service firms, that may supply goods and services for the facility. In addition, induced jobs and salaries are created in new or existing local businesses, such as retail stores, gas stations, banks, restaurants, and service companies that may supply goods and services to workers and their families.

The RIMS II multipliers used in this analysis are shown below along with additional information about the RIMS II model.

RIMS II Industry	Final-demand Output	Final-demand Earnings	Final-demand Employment	Final-demand Value-added	Direct-effect Earnings	Direct-effect Employment
2332 Nonresidential structures	1.2639	0.5427	9.5880	0.7029	1.1258	1.1650
2211A0 Electric power generation, transmission, and distribution*	1.2761	0.1228	1.7697	0.7441	1.5772	2.5684
1 Farms	1.3683	0.2214	8.4529	0.5640	1.6047	1.3525

Regional Input-Output Modeling System (RIMS II)

The economic impact estimates in this report are based on the Regional Input-Output Modeling System (RIMS II), a widely used regional input-output model developed by the U. S. Department of Commerce, Bureau of Economic Analysis. The RIMS II model is a standard tool used to estimate regional economic impacts. The economic impacts estimated using the RIMS II model are generally recognized as reasonable and plausible assuming the data input into the model is accurate or based on reasonable assumptions. The RIMS II model is described in basic detail below.

Generally speaking, input-output modeling attempts to estimate the changes that occur in all industries based on a change in the demand for the output of an industry. An input-output model allows an analyst to identify the subsequent changes occurring in various industries within a regional economy in order to estimate the total impact on the economy. Total economic impact is the sum of three components: (1) direct, (2) indirect, and (3) induced impacts.

If the demand for the output of an industry, measured by industry sales or revenue, increases by \$1.0 million, total regional output increases by \$1.0 million. This initial change in output is called the change in direct economic output and also referred to as the direct expenditure effect. The change in total economic output in the region resulting from the initial change does not stop with the change in direct economic output. Businesses in a variety of industries within the region will be called upon to increase their production to meet the needs of the industry where the initial increase in demand occurs. Further, other suppliers must also increase production to meet the needs of the group of initial supplier firms to the industry. This increase in expenditures by regional suppliers is considered the indirect economic impact of the initial \$1.0 million in sales, and is classified as indirect expenditures of the total economic impact or the change in indirect economic output.

The total economic impact of the \$1.0 million in sales includes one more component, the induced impact. All economic activity, whether direct or indirect, that results from the initial increase in demand of \$1.0 million, requires workers, and these workers must be paid for their labor. This means that part of the direct and indirect expenditures is actually in the form of wages and salaries paid to workers in the various affected industries. These wages and salaries will in turn be spent in part on goods and services produced locally in the region. This spending is another part of the regional economic impacts referred to as induced impacts and is classified as induced expenditures or the change in induced economic output.

Based on the initial direct impact, the RIMS II model can be used to estimate the direct, indirect and induced impacts on economic output, value added, earnings and employment in a given region. Economic output is gross output and is the sum of the intermediate inputs and final use. This is a duplicative total in that goods and services will be counted multiple times if they are used in the production of other goods and services. Value added is defined as the value of gross output less intermediate inputs. Workers' earnings or earnings consist of wages and salaries, employer provided benefits and proprietors' income. Employment consists of a count of jobs that include both full-time and part-time workers.

The RIMS II model is based on regional multipliers, which are summary measures of economic impacts generated from changes in direct expenditures, earnings, or employment. Multipliers show the overall impact to a regional economy resulting from a change in demand in a particular industry. Multipliers can vary widely by region. Multipliers are higher for regions with a diverse industry mix. Industries that buy most of their materials from outside the state or region tend to have lower multipliers. Multipliers tend to be higher for industries located in larger areas because more of the spending by the industry stays within the area.

The RIMS II model generates six types of multipliers for approximately 400 industrial sectors for any region in the United States. The multipliers include four "final-demand" multipliers and two "direct-effect" multipliers. Final demand multipliers indicate the impact of changes in final demand for the output of a particular regional industry on total regional output, earnings, employment and value added. Direct-effect multipliers indicate the impact of changes in regional earnings or employment within a particular industry on total employment or earnings within a region.

Final-demand output multipliers indicate the total regional output (direct, indirect and induced expenditures) that results from an increase in direct expenditures for a good produced by a particular regional industry. For example, if an industry in a particular region is said to have a final demand output multiplier of 2, this tells us that a \$1 increase in final demand for the good produced by that industry results in a \$2 increase in total output or expenditures within the regional economy. Final-demand earnings multipliers indicate the impact of an increase in final demand for the good of a particular regional industry on the total earned income of households within the region. Final-demand employment multipliers indicate the increase in total regional employment that results from a \$1.0 million increase in final demand for the good produced by a particular regional industry. Final-demand value-added multipliers indicate the increase in total regional value added that results from a \$1.0 million increase in final demand for the good produced by a particular regional industry. Direct-effect earnings multipliers indicate the impact of a \$1 change in earnings within a particular regional industry on total earnings in all industries within a region. Direct-effect employment multipliers indicate the impact of a change in employment in a particular regional industry on total employment in all industries within a region.

Theoretically, changes in final demand drive the total change in economic output, earnings, and employment. However, these multiplier relationships can be used to estimate impacts in other ways if only limited information is known about a project. For example, the multiplier relationships can be used to estimate the increase in direct economic output based on a given level of employment in a specific industry.

Additional Notes on RIMS II

RIMS II multipliers are based on the average relationships between the inputs and outputs produced in a local economy. The multipliers are a useful tool for studying the potential impacts of changes in economic activity. However, the relative simplicity of input-output multipliers comes at the cost of several limiting assumptions.

- Firms have no supply constraints—Input-output based multipliers assume that industries can increase their demand for inputs and labor as needed to meet additional demand.
- Firms have fixed patterns of purchases—Input-output based multipliers assume that an industry must double its inputs to double its output.
- Firms use local inputs when they are available—The method used by RIMS II to develop regional multipliers assumes that firms will purchase inputs from firms in the region before using imports.

RIMS II, like all input-output models, is a “static equilibrium” model. This means that there is no specific time dimension associated with the results using the model. For the RIMS II model, it is customary to assume that the impacts occur in one year because the model is based on annual data.

The fiscal impacts calculated in this report are described in the text of the report.

About Impact DataSource

Established in 1993, Impact DataSource is an Austin, Texas-based economic consulting firm. Impact DataSource provides high-quality economic research, specializing in economic and fiscal impact analyses. The company is highly focused on supporting economic development professionals and organizations through its consulting services and software. Impact DataSource has conducted thousands of economic impact analyses of new businesses, retention and expansion projects, developments, and activities in all industry groups throughout the U.S.