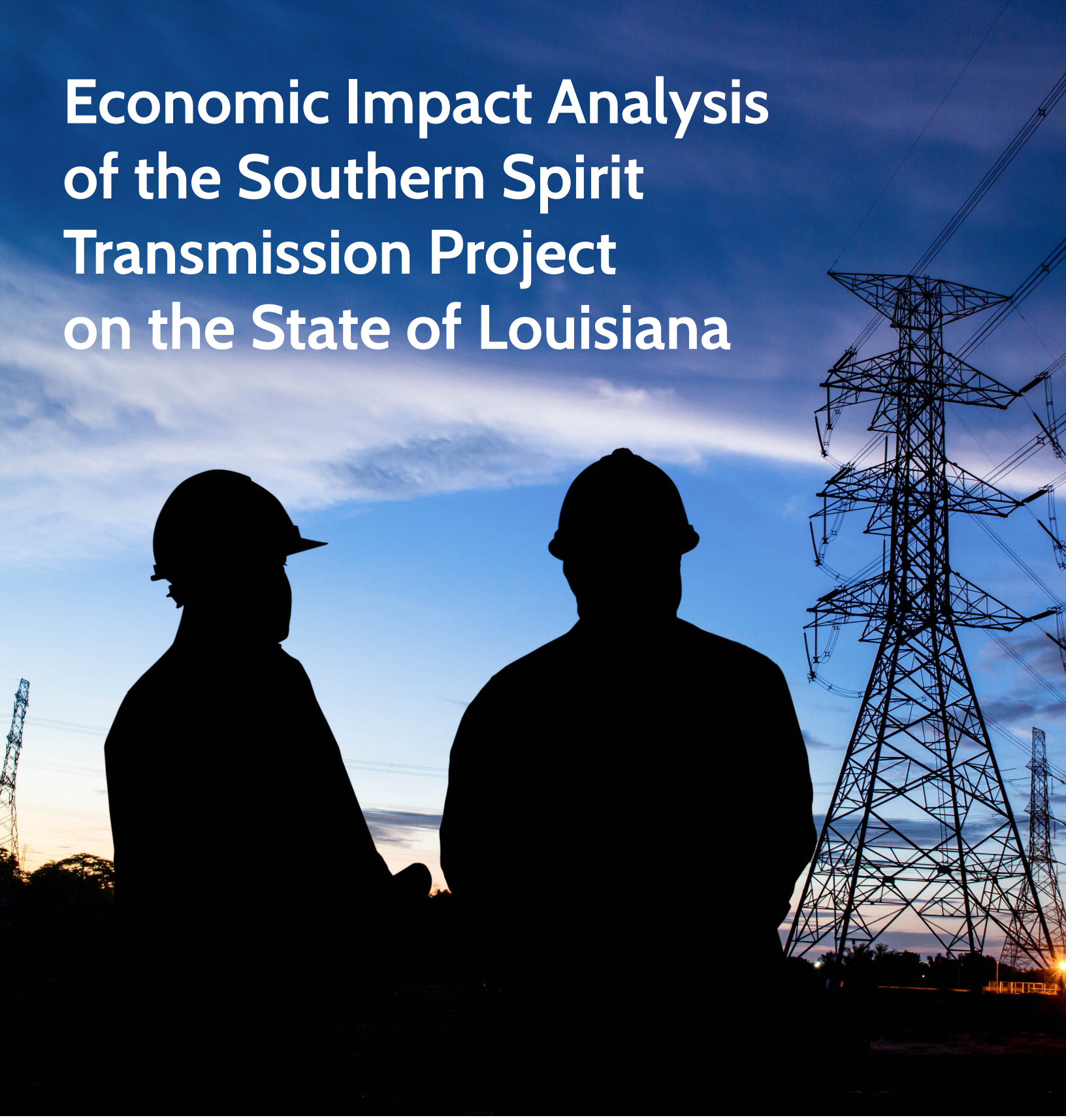
Economic Impact Analysis of the Southern Spirit Transmission Project on the State of Louisiana



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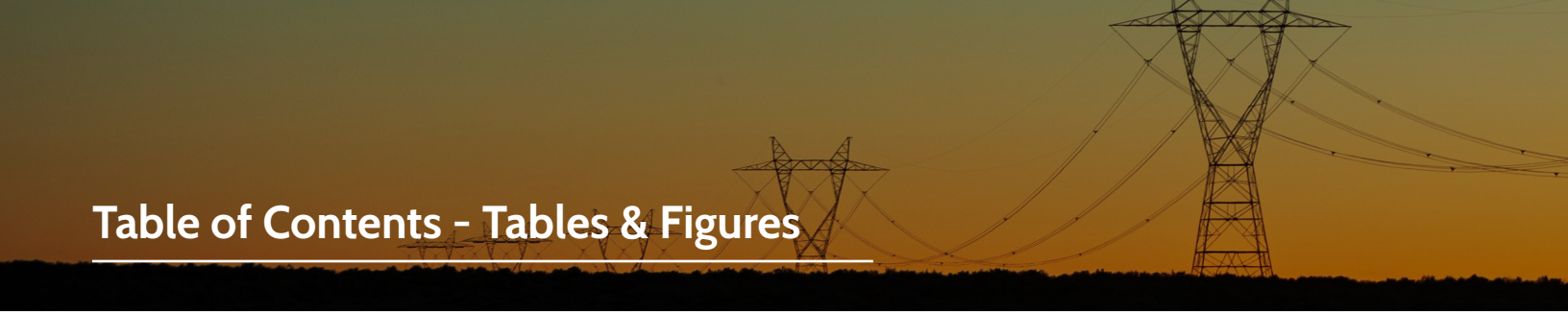

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I. Executive Summary of Findings

The Southern Spirit Transmission Project (the Project) is a high voltage direct current (HVDC) 525-kilovolt transmission line that includes a converter station in De Soto Parish, LA and dedicated HVDC transmission line with connection to a converter station in Choctaw County, MS. Although the exact route has not been chosen, the line runs approximately 323 miles across De Soto, Red River, Bienville, Jackson, Ouachita, Richland, Franklin, and East Carroll Parishes in Louisiana, and Issaquena, Washington, Sharkey, Humphreys, Holmes, Carroll, Montgomery, and Choctaw Counties in Mississippi.

The purpose of this report is to aid decision-makers in evaluating the economic impact of this Project on the State of Louisiana. This analysis estimates the direct, indirect, and induced impacts on job creation, wages, and total economic output of the transmission line itself.

The Southern Spirit Transmission Line represents an investment of over $2.68 billion in total by Pattern Energy. The total development is anticipated to result in the following:

Jobs[1]

- 12,278 job-years during the construction and first 40 years of operation for the State of Louisiana
- 2,032 jobs during construction for the State of Louisiana
- 256 local long-term jobs for the State of Louisiana

Worker Earnings[2]

- Over $537 million in earnings during the construction and first 40 years of operation for the State of Louisiana
- Over $170 million in earnings during construction for the State of Louisiana
- Over $9.1 million in local long-term earnings for the State of Louisiana annually

Economic Output[3]

- Over $2.2 billion in output during the construction and first 40 years of operation for the State of Louisiana
- Over $307 million in output during construction for the State of Louisiana
- Over $47.6 million in local long-term output for the State of Louisiana annually

[1] All jobs numbers are full-time equivalent jobs and include direct, indirect, and induced jobs. With a two-year construction period, the Project construction job figures would be divided in half for the number of jobs supported in any given year.

[2] Worker Earnings include the wages, salary and benefits associated with these jobs.

[3] Economic Output is the value of goods and services produced in the state or local economy. It is an equivalent measure to the Gross Domestic Product. Economic Output includes Worker Earnings.

II. Economic Benefits to Transmission Lines

Most consumers of electricity do not give much thought to how their electricity gets delivered to their home or business. A vital piece of this delivery system is the electric transmission system. The transmission system connects large electric generators to the local distribution grid using HV transmission lines. Historically, public utilities built transmission lines to connect their own large-scale generators to their distribution system. Such transmission lines helped individual utilities to service their load but were not optimized to the modern realities of an interconnected grid that trades electricity across utility, state and even international borders. Today, transmission lines are necessary to ensure reliability allowing electricity to flow from one area to another to ensure that the supply is balanced with demand.

The total job growth from any infrastructure project, including transmission projects, can be divided into direct, indirect, and induced jobs:

- **Direct Jobs.** These are workers directly involved in the construction and maintenance of the project.
- **Indirect Jobs.** Numerous other jobs are supported through indirect supply chain purchases. For example, materials like wire, steel, and aggregate sourced within the state will support jobs for those suppliers.
- **Induced Jobs.** Higher spending by direct and indirect workers results in additional spending and jobs that are referred to as "induced" spending and jobs. As an example, grocery store workers, waiters and waitresses would be supported through spending from other workers.

In addition to job creation, transmission projects typically pay significant property taxes. As such, they strengthen the local tax base and help improve county services and local infrastructure, such as public roads.

It is important to measure the earnings associated with the jobs that are created or supported by a project to ensure that they are good-paying jobs. Throughout this report, we will refer to earnings that result from this Project. Earnings include wages, salary and associated benefits. Earnings are only payments that are associated with employment. But the Project will also make property tax payments and landowner easement payments that are not associated with a job. To capture the economic impact of those payments, we use the broadest measure of economic impact – economic output. Economic output measures the value of goods and services in an economy. Gross Domestic Product (GDP) is the economic output of the U.S. as a whole.

Several studies have examined the economic impact of transmission line construction.

- The author studied the economic impact of the proposed Rock Island Clean Line transmission line across Iowa and Illinois costing $1.5 billion (Carlson, Loomis, and Solow, 2011). They found that the line would result in 1,451 jobs, $86.8 million in labor income and $256 million in output for Illinois and 2,718 jobs, $120 million in labor income and $394.2 million in output for Iowa annually over a three-year construction period.
- NREL found that four HV transmission lines designed to export electricity from Wyoming would result in an average of 4,000-5,000 jobs per year for 10 years (Lantz & Tegen, 2011).
- Strategic Economics Group (2013) examined the economic impacts of ITC Midwest Transmission Multi Value Projects (MVP) #3 and #4, both 345 kV transmission lines totaling 198.25 miles across Minnesota and Iowa. They were expected to cost $255.5 million for MVP 3 and $305.3 million for MVP 4. The combined impact of the projects was estimated to be 4,275 job-years resulting in $207.8 million in labor income and $723.2 million in output.
- MISO studied the economic impact of in-service transmission projects from 2002 to 2015 totaling $9.4 billion and found that 16,700 to 25,800 total jobs were created or supported in peak year 2014 with $5 to $8 billion in labor income and $6.7 to $11.3 billion of value-added impacts (MISO, 2015).
- Iowa State University calculated direct and indirect estimates of job creation over a 30-year time frame due to construction and operation of a large-scale transmission expansion. The expansion increased employment for generation of energy from renewables from 650,000 to 950,000 (Swenson, 2018).
- The lead author studied the economic impact of the proposed SOO Green HVDC Link Transmission Project that is to run from Mason City, Iowa to Plano, Illinois and is expected to cost almost $2.5 billion. This project is expected to support 6,799 jobs during construction in Iowa and an additional 5,614 jobs during construction in Illinois over a three-year period (Loomis, 2020a; Loomis, 2020b).
- The authors examined the 345-kilovolt, 95-mile Wolf Creek-Blackberry Transmission Project between Coffey County, Kansas and Jasper County, Missouri. The $85.1 million project was found to support 998 jobs during construction in Kansas and 203.5 jobs during construction in Missouri (Loomis, Loomis and Thankan, 2022a and 2022b).
- The authors studied the economic impact of the proposed 700-mile, $5.7 B Grain Belt Express Transmission Project going from Western Kansas to Western Indiana (Loomis, Loomis and Thankan, 2022c). They found that the line would result in 4,999 jobs, $565.5 million in labor income and $942.3 million in output for Illinois; 8,628 jobs, $936.2 million in labor income and $1.53 billion in output for Kansas; and 5,747 jobs, $586.1 million in labor income and $986.1 million in output for Missouri annually over a three-year construction period.

III. State and Parish Economics

3.1 State of Louisiana

Louisiana is located in the Southern part of the United States (see Figure 3.1). It has a total area of 52,069 square miles and the U.S. Census estimates that the 2020 population was 4,657,757 with 2,089,777 housing units. The state has a population density of 107 (persons per square mile) compared to 87 for the United States. Median household income in the state was $49,469 (U.S. Census Bureau).

Figure 3.1 – Location of Louisiana

i. Economic and Demographic Statistics

As shown in Table 3.1, the largest industry is "Health Care and Social Assistance" followed by "Administrative Government," "Retail Trade" and "Accommodation and Food Services." These data for Table 3.1 come from IMPLAN covering the year 2020 (the latest year available).

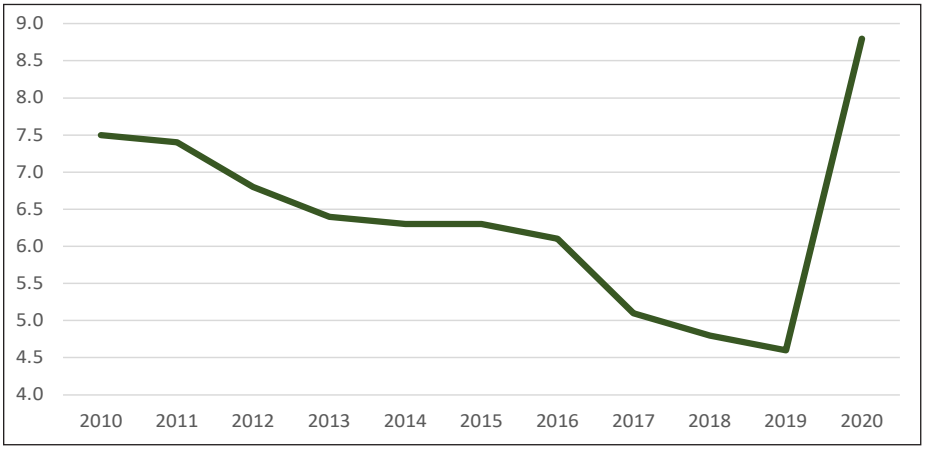
Table 3.1 – Employment by Industry in Louisiana

Industry	Number	Percent
Health Care and Social Assistance	313,063	12.0%
Administrative Government	307,069	11.8%
Retail Trade	234,257	9.0%
Accommodation and Food Services	208,595	8.0%
Construction	191,341	7.4%
Other Services (except Public Administration)	184,621	7.1%
Professional, Scientific, and Technical Services	165,499	6.4%
Administrative and Support and Waste Management and Remediation Services	156,090	6.0%
Manufacturing	144,337	5.6%
Real Estate and Rental and Leasing	128,550	4.9%
Transportation and Warehousing	115,496	4.4%
Finance and Insurance	110,466	4.2%
Wholesale Trade	70,650	2.7%
Agriculture, Forestry, Fishing and Hunting	53,030	2.0%
Mining, Quarrying, and Oil and Gas Extraction	46,828	1.8%
Arts, Entertainment, and Recreation	45,081	1.7%
Educational Services	42,589	1.6%
Management of Companies and Enterprises	26,524	1.0%
Information	24,777	1.0%
Government Enterprises	21,913	0.8%
Utilities	9,062	0.3%

Source: Impact Analysis for Planning (IMPLAN), State Employment by Industry, 2020

Table 3.1 provides the most recent snapshot of total employment but does not examine the historical trends within the state. Figure 3.2 shows the unemployment rate from 2010 to 2020. The unemployment rate in Louisiana was decreasing steadily until it hit a low of 4.6 in 2019. The unemployment rate then rose to a high of 8.8 by 2020 (BEA, 2021).

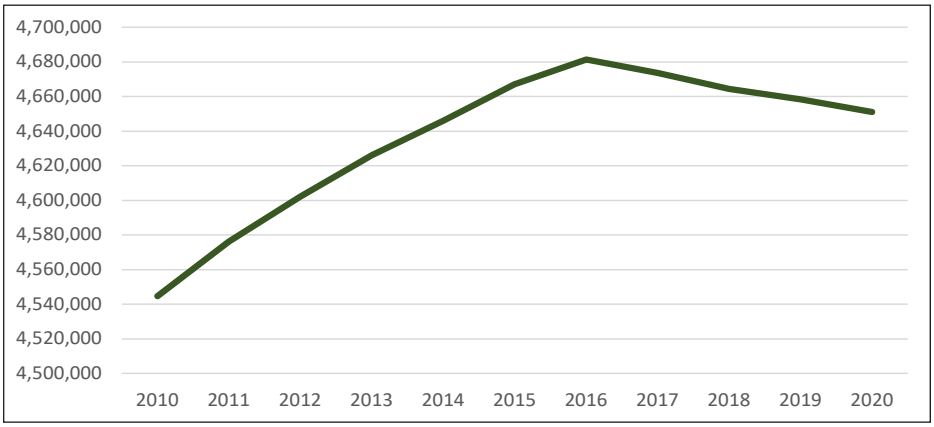
Figure 3.2 – Unemployment Rate in Louisiana from 2010 to 2020



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Unemployment Rate, 2010-2020

Similar to the employment trend, the overall population in the state has fluctuated, as shown in Figure 3.3. Louisiana population was 4,544,635 in 2010 and 4,651,203 in 2020, a gain of 106,568 (FRED, 2021). The average annual population increase over this time period was 10,657.

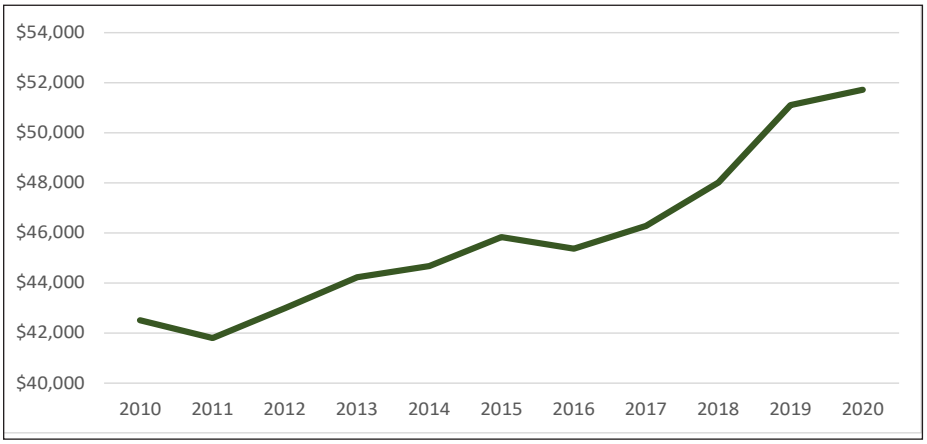
Figure 3.3 – Population in Louisiana from 2010 to 2020



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Population Estimates, 2010-2020

Like the population trend, household income has been fluctuating in Louisiana. Figure 3.4 shows the median household income in Louisiana from 2010 to 2020. Household income was at its lowest at $41,804 in 2011 and its highest at $51,730 in 2020 (FRED, 2021).

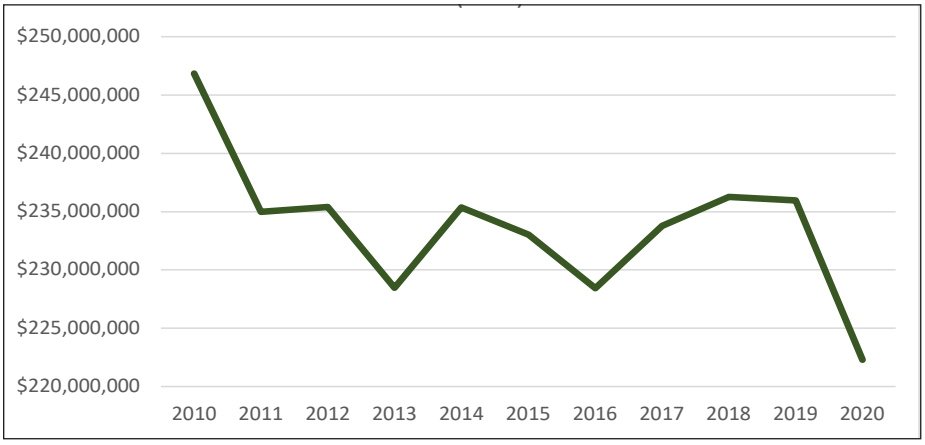
Figure 3.4 – Median Household Income in Louisiana from 2010 to 2020



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Median Household Income, 2010-2020

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 Louisiana has been decreasing since hitting a high in 2010, as shown in Figure 3.5 (BEA, 2021).

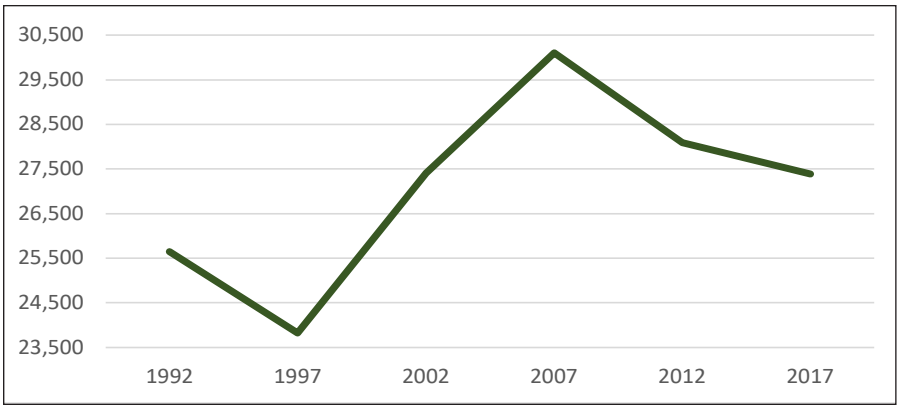
Figure 3.5 – Real Gross Domestic Product (GDP) in Louisiana from 2010 to 2020



Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income, 2010-2020

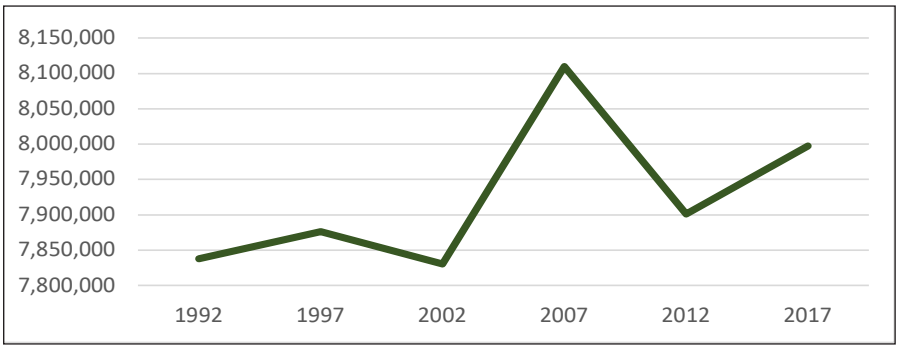
The farming industry has increased in Louisiana. As shown in Figure 3.6, the number of farms has increased from 25,652 in 1992 to 27,386 in 2017. The amount of land in farms has also increased. The state farmland hit a low of 7,830,664 acres in 2002 and a high of 8,109,975 acres in 2007 according to Figure 3.7.

Figure 3.6 – Number of Farms in Louisiana from 1992 to 2017



Source: Census of Agriculture, 1992-2017

Figure 3.7 – Land in Farms in Louisiana from 1992 to 2017



Source: Census of Agriculture, 1992-2017

3.2 Louisiana Parish Economics

The economic and demographic statistics of the Louisiana parishes are contained in this section. As listed in Table 3.2, the population and population density for Ouachita Parish is much higher than the other parishes. Because it is so different, Ouachita Parish's population and GDP data is graphed separately from the rest of the parishes. Figure 3.8 shows the location of each of the parishes across the State of Louisiana.

Table 3.2 – Demographic Statistics for Parish Locations of the Southern Spirit Transmission Line

Parish	Total Area (square miles)	2020 Census Population	2019 Census housing units	Population Density	Median Household Income
Bienville Parish	822	12,981	7,945	16	$30,272
De Soto Parish	895	26,812	13,400	30	$46,006
East Carroll Parish	442	7,459	2,896	18	$22,346
Franklin Parish	635	19,774	9,403	33	$35,282
Jackson Parish	580	15,031	7,957	28	$39,139
Ouachita Parish	632	160,368	69,471	250	$41,121
Red River Parish	402	7,620	4,247	60	$33,816
Richland Parish	576	20,043	9,068	36	$34,029

Figure 3.8 – Location of Parishes in Louisiana

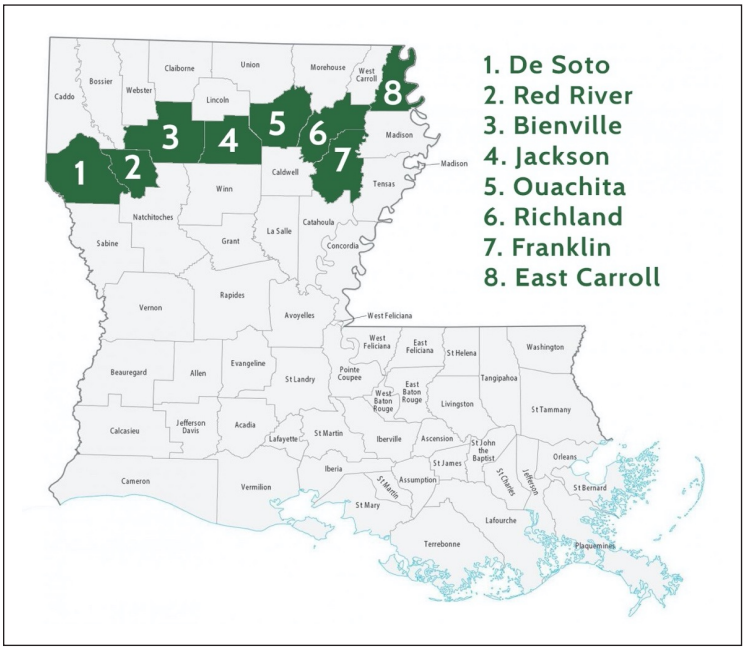
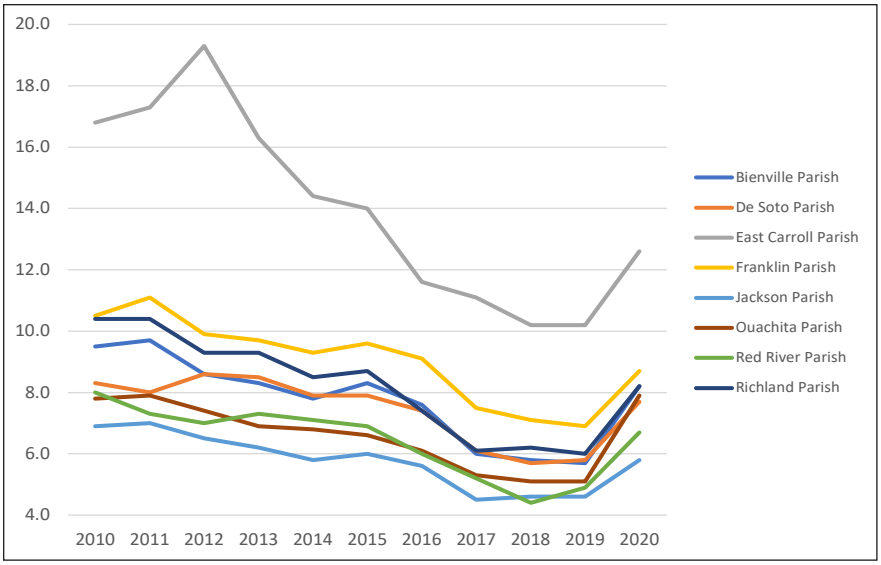


Figure 3.9 – Unemployment Rate in All Parishes from 2010 to 2020

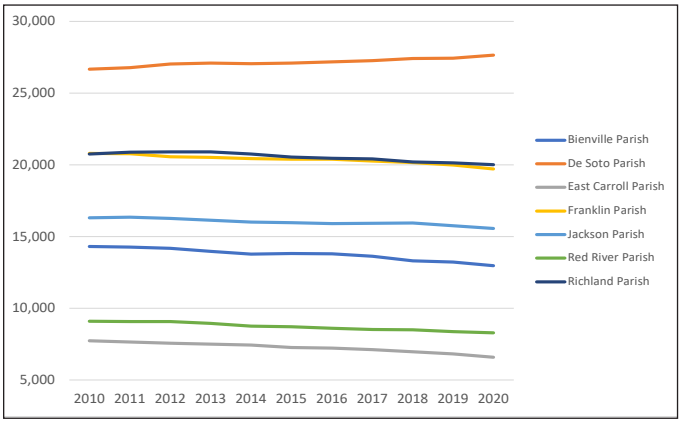


Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income

Figure 3.9 shows the historical trends of the unemployment rate from 2010 to 2020 within the parishes. All of the parishes had a declining unemployment rate until around 2019 when the unemployment rate started increasing.

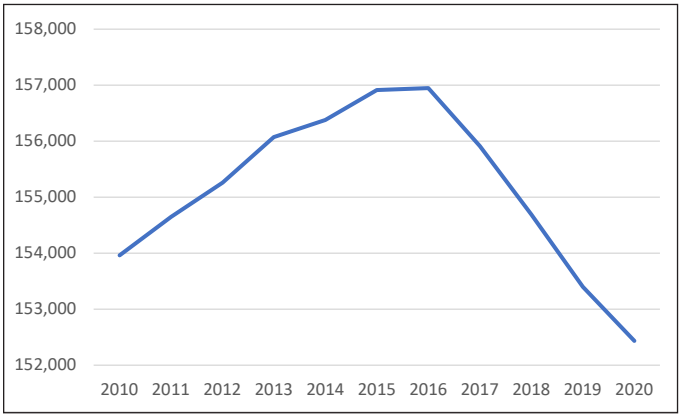
Similar to the unemployment rates, the overall population in most of the parishes has declined, as shown in Figures 3.10 and 3.11. De Soto Parish is the only parish who has seen an increase in population, gaining 980 people since 2010. Ouachita Parish has seen the greatest decrease in population, a loss of 4,509 people since 2016.

Figure 3.10 – Population in Parishes from 2010 to 2020



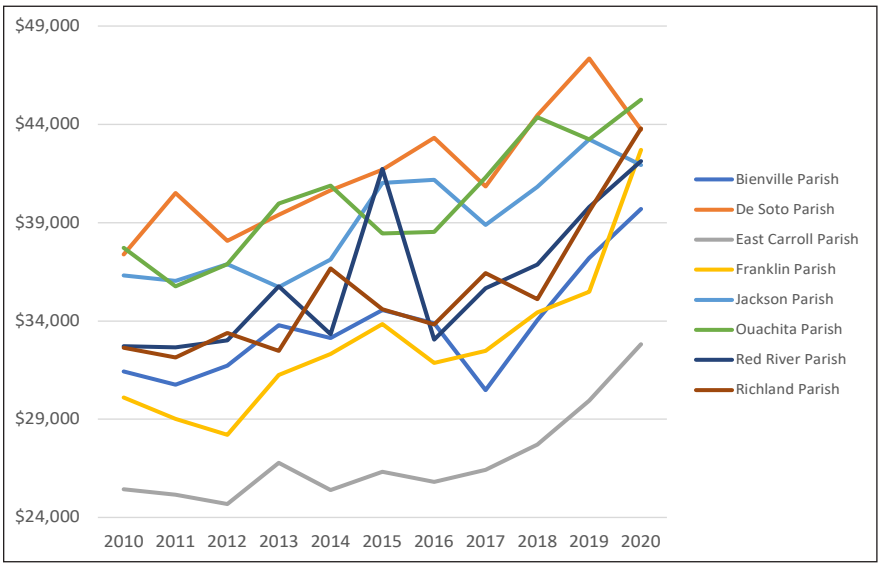
Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Population Estimates

Figure 3.11 – Population in Ouachita Parish from 2010 to 2020



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

Figure 3.12 – Median Household Income in All arishes from 2010 to 2020

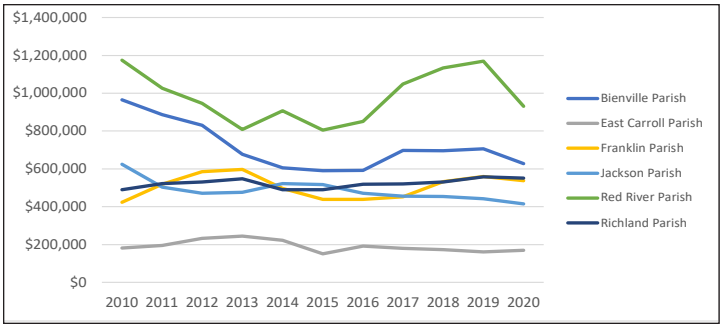


Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Median Household Income

Figure 3.12 shows the median household income in all of the parishes from 2010 to 2020. Household income has been increasing for all parishes.

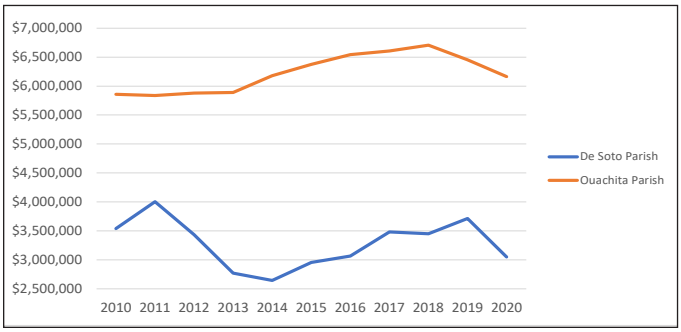
Real Gross Domestic Product (GDP) is a measure of the value of goods and services produced in an area and adjusted for inflation over time. The Real GDP for has fluctuated in all of the parishes over the last decade, as shown in Figures 3.13 and 3.14.

Figure 3.13 – Real Gross Domestic Product (GDP) in Parishes from 2010 to 2020



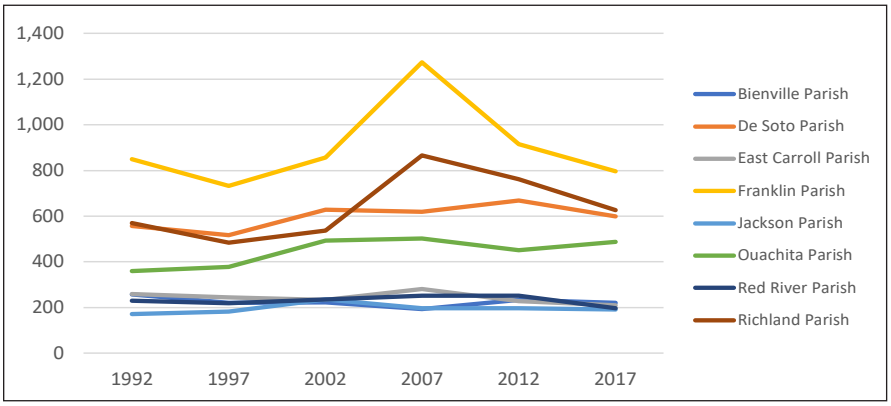
Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income

Figure 3.14 – Real Gross Domestic Product (GDP) in De Soto and Ouachita Parishes from 2010 to 2020



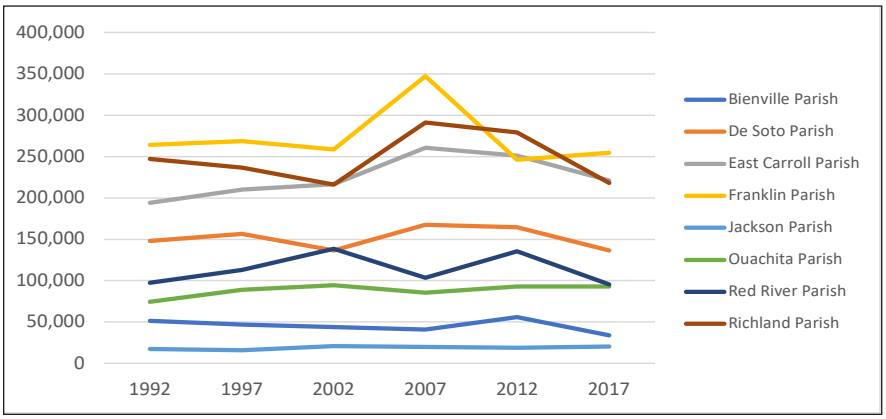
Source: Bureau of Economic Analysis, Regional Data, GDP and Personal Income

Figure 3.15 – Number of Farms in All Parishes from 1992 to 2017



Source: Census of Agriculture, 1992-2017

Figure 3.16 – Land in Farms in All Parishes from 1992 to 2017



Source: Census of Agriculture, 1992-2017

The farming industry has fluctuated in the parishes. As shown in Figure 3.15, some of the parishes increased in the number of farms since 1992, including De Soto, Jackson, Ouachita, and Richland Parishes. The amount of land in farms has fluctuated greatly as well. All of the parishes, except for East Carroll, Jackson and Ouachita Parishes, have seen a decline in the amount of farmland, according to Figure 3.16.

IV. Economic Impact Methodology

The impacts of construction and operation of the transmission line were estimated using the IMPLAN model. The specific impacts analyzed include direct, indirect, and induced effects on employment, labor income, and output for the State of Louisiana.

4.1 IMPLAN

The economic impacts of the manufacture of the required components, construction of the line, and operation and maintenance expenses were estimated using the IMPLAN model and 2021 data for Louisiana and the individual parishes. Stated briefly, the model is used to estimate the total impacts of an increase in spending in a particular industry. IMPLAN is an on-line program that allows construction of regional input-output models for areas ranging in size from a single zip code region to the entire United States. The model allows aggregation of individual regional - e.g., county - databases for multi-region analysis.

Total impacts are calculated as the sum of direct, indirect, and induced effects. *Direct effects* are production changes associated with the immediate effects of final demand changes, such as an increase in spending for the manufacture of new structures that will be used to support a new transmission line. *Indirect effects* are production changes in backward-linked industries caused by the changing input needs of the directly affected industry, e.g., additional purchases to produce additional output such as the steel used in the construction of the new transmission structures. *Induced effects* are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. An example of the latter is the increased spending of incomes earned by newly hired steel workers.

The analysis summarized here focuses on the impacts of increased manufacturing of the different components of the transmission line, as well as construction of the line, on employment, employee compensation, and total expenditures (output). Employment includes total wage and salary employees as well as self-employed jobs in the region of interest. All of the employment figures reported here are full-time equivalents[4] (FTE). Employee compensation represents income, including benefits, paid to workers by employers, as well as income earned by sole proprietors. Total output represents sales (including additions to inventory), i.e., it is a measure of the value of output produced. Impacts are estimated on a state-wide basis for Louisiana and for individual counties.

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

4.2 Project Cost and Transmission Modeling Assumptions

To estimate the economic impact of Project construction, we estimated construction costs by budget category and the geographic location where those costs will be incurred. Table 4.1 shows the estimated costs provided by the client. These budget categories are then translated into IMPLAN Sector Codes and allocated into the appropriate geographic boundaries. The total Project costs modeled were $2.68 billion. All construction spending was assumed to be spread evenly over the two-year construction period from 2025 to 2026.

Table 4.1 – Estimated Total Transmission Construction Cost ($M)

Budget Category	Total
Converter Stations	$1,216
DC Transmission Line	$1,030
AC Transmission Line	$125
Switching Stations and Crossings	$49
Development	$263
Grand Total	**$2,684**

Table 4.2 – Total Construction Costs Incurred in Louisiana

IMPLAN Code	IMPLAN Description	Louisiana
	Direct Labor	$113,155,517
	Landowner Payments	$22,011,189
52	New Power and communication structures	$8,692,416
3029	Sand and Gravel Mining	$11,415,363
3236	Fabricated structural metal manufacturing	$17,560,110
3329	Power, distribution, and specialty transformer manufacturing	$10,542,759
3336	Other communication and energy wire manufacturing	$31,749,359
3339	All other miscellaneous electrical equipment and component manufacturing	$9,308,732
3447	Other real estate	$11,923,957
3455	Legal Services	$6,667,427
3457	Architectural, engineering, and related services	$3,997,277
3463	Environmental and other technical consulting services	$15,302,435
3465	Advertising, public relations, and related services	$2,251,132
3507	Hotels and motels, including casino hotels	$46,411,443
3509	Full-service restaurants	$13,039,405
3510	Limited-service restaurants	$13,039,405
3534	Local governments category	$187,198
3480	Elementary and Secondary Schools	$187,198
TOTAL		**$337,442,322**

Though the grand total capital expenditures exceed $2.6 billion, Strategic Economic Research used far smaller numbers for total construction costs in Louisiana as inputs into the economic model. A non-exhaustive list of costs that were excluded follows: $579 million for converter station materials purchased outside the country, $131 million for other non-local materials costs, $991 million for out of state labor costs, $124 million for AC line costs, and $288 million for costs allocated to the State of Mississippi. Table 4.2 shows the statewide total construction costs broken out by IMPLAN sector that is expected to be spent over two years starting in 2025 in Louisiana.[5]

[5] The construction period may extend beyond 2026 but the total construction costs will remain the same. If the timing changes on the final construction plans, the model will be updated accordingly and final estimates will be ready at the time of the notice to proceed.

The construction costs shown above were generally allocated to the parishes proportional to the number of miles estimated to be in that parish. River crossings, converter stations, substations and other costs that are known to be in a specific parish were allocated to that parish. These inputs are modeled using Analysis By Parts (ABP). Under this method, direct jobs, earnings and output are calculated outside of IMPLAN. Direct labor income and household spending (by income level within the state) are input into IMPLAN to show the induced impacts that would result from these expenditures. Converter stations are assumed to be purchased from overseas but the labor to install them are assumed to be sourced locally.

Table 4.3 shows the operations and maintenance costs broken out by IMPLAN sector and state.

Table 4.3 – Estimated Annual Operations Cost by IMPLAN Category in Louisiana

IMPLAN Code	IMPLAN Description	Louisiana Annual Spending
47	Electric power transmission and distribution - Converter Stations	$5,610,375
47	Electric power transmission and distribution - T-Line	$4,781,103
445	Insurance Agencies, Brokerages, and related activities	$173,250
480	Elementary and secondary schools	$4,374,888
	Other real estate	$139,542
495	Community food, housing, and other relief services, including rehabilitation services	$60,042
522	Grantmaking, giving, and social advocacy organizations	$60,042
534	Other local government	$4,374,888
	Total Annual Spending	**$19,434,588**

These expenses are also modeled in IMPLAN using ABP and allocated to the parishes by line-mile except for the converter station labor. Converter station labor is allocated to the parish in which the converter station will be located.

Other methods can be used to measure the economic impact of transmission projects but the ABP method provides the most accurate result. Other methods include (1) measuring the total expenditures in the state and (2) estimating the impact using the general category of "Construction of New Power and Communication Structures." Using total expenditures to measure the economic impact will tend to overestimate the economic impact because some of those expenditures will be made centrally. For example, the transmission wire may be purchased centrally for the whole project and manufactured in another state. Technically, the wire was not an expenditure in the state in question and so it should not be counted for economic impact purposes. It is counted as an investment in the state but not an expenditure that will have a multiplier effect. Table 4.2 above takes care to only measure expenditures that are expected to take place in Louisiana. Although it totals $337 million, it is a small portion of the overall construction costs of $2.684 billion as shown in Table 4.1. Using the methodology in this report provides more accurate and more conservative estimates of the true economic impact of the Project on the parish and state economies.

Modeling the economic impacts using the general construction category is also less accurate than the method used in this report. The general construction category uses historical data for other projects to measure the inter-industry linkages involved in the economic impact analysis. The method in this report uses specific knowledge of the budgeting of costs by category derived from information from Pattern to measure these expenditures. In addition, this construction category includes all power line construction and communications structures. While the direct-current transmission line is certainly included in this category, so would cellphone towers, electric distribution lines and many other dissimilar construction projects be assigned to this category. Furthermore, since this will be the first direct-current transmission line built across the state, the historical data within IMPLAN will have no history of inter-industry linkages for this type of construction project. Using ABP, the specific industries and specific spending is used as inputs into the model and there will be historical data on these types of inter-industry linkages.

V. Economic Impact Results

The economic impact results were derived from detailed project cost estimates supplied by Pattern Energy and the assumptions detailed in the previous section. Tables 5.1 to 5.6 show the economic impact of the Project using the IMPLAN model. These tables report the employment, earning and output results at the parish level and state level during construction. Because these results only look at the effects of the expenditures within the parish they do not add up to the state totals. Other expenditures such as out of state labor, imported materials for the converter stations, and expenditures on the Mississippi portion of the Project make up the remaining balance of the total costs of the Project.

Tables 5.1 and 5.2 show the employment impacts from the transmission line on the parishes in Louisiana and the State of Louisiana during construction and operations. The local jobs created or retained during construction total 206 for Bienville Parish, 681 for De Soto Parish, 117 for East Carroll Parish, 34 for Franklin Parish, 131 for Jackson Parish, 156 for Ouachita Parish, 107 for Red River Parish, 200 for Richland Parish, and 2,032 for the State of Louisiana. The local long-term jobs created from the Project total 2.6 for Bienville Parish, 163.1 for De Soto Parish, 15 for East Carroll Parish, 5.6 for Franklin Parish, 3.8 for Jackson Parish, 6.9 for Ouachita Parish, 9.1 for Red River Parish, 11.5 for Richland Parish, and 256 for the State of Louisiana.

Table 5.1 – Total Employment Impact from the Southern Spirit Transmission Line for Louisiana Parishes

	Bienville Parish	De Soto Parish	East Carroll Parish	Franklin Parish	Jackson Parish
Construction					
Direct	36	215	33	7	36
Indirect	150	372	70	19	69
Induced	20	94	14	8	26
Total	**206**	**681**	**117**	**34**	**131**
Operations					
Direct	1.9	140.6	14.0	5.1	1.8
Indirect	0.4	16.8	0.6	0.3	1.5
Induced	0.3	5.8	0.4	0.2	0.5
Total	**2.6**	**163.1**	**15.0**	**5.6**	**3.8**

Table 5.2 – Total Employment Impact from the Southern Spirit Transmission Line for Louisiana Parishes (Cont.)

	Ouachita Parish	Red River Parish	Richland Parish	Rest of Louisiana	State of Louisiana
Construction					
Direct	22	26	50	0	425
Indirect	90	64	99	56	989
Induced	44	17	51	345	618
Total	**156**	**107**	**200**	**401**	**2,032**
Operations					
Direct	4.9	8.1	9.3	0.0	186
Indirect	0.8	0.5	0.8	0.0	34
Induced	1.2	0.5	1.4	12.9	36
Total	**6.9**	**9.1**	**11.5**	**12.9**	**256**

Tables 5.3 and 5.4 show the earnings impacts from the transmission line for the parishes in Louisiana and the State of Louisiana during construction and operations. The local earnings during construction total over $13 million for Bienville Parish, over $73.2 million for De Soto Parish, over $10.6 million for East Carroll Parish, over $2.7 million for Franklin Parish, over $13 million for Jackson Parish, over $11.2 million for Ouachita Parish, over $8.9 million for Red River Parish, over $18.4 million for Richland Parish, and over $170 million for the State of Louisiana. The local long-term earnings from the Project total over $260 thousand for Bienville Parish, over $4.6 million for De Soto Parish, over $382 thousand for East Carroll Parish, over $66.9 thousand for Franklin Parish, over $303 thousand for Jackson Parish, over $349 thousand for Ouachita Parish, over $306 thousand for Red River Parish, over $615 thousand for Richland Parish, and over $9.1 million for the State of Louisiana.

Table 5.3 – Total Earnings Impact from the Southern Spirit Transmission Line for Louisiana Parishes

	Bienville Parish	De Soto Parish	East Carroll Parish	Franklin Parish	Jackson Parish
Construction					
Direct	$9,609,888	$57,130,843	$8,690,604	$1,971,080	$9,646,863
Indirect	$2,801,288	$13,455,956	$1,541,448	$567,792	$2,585,153
Induced	$624,282	$2,670,264	$393,536	$206,924	$784,114
Total	**$13,035,458**	**$73,257,063**	**$10,625,588**	**$2,745,796**	**$13,016,130**
Operations					
Direct	$238,489	$3,321,752	$351,308	$54,365	$175,071
Indirect	$15,152	$1,161,433	$20,133	$8,242	$113,227
Induced	$7,175	$163,978	$11,282	$4,322	$15,547
Total	**$260,816**	**$4,647,163**	**$382,723**	**$66,929**	**$303,845**

Table 5.4 – Total Earnings Impact from the Southern Spirit Transmission Line for Louisiana Parishes (Cont.)

	Ouachita Parish	Red River Parish	Richland Parish	Rest of Louisiana	State of Louisiana
Construction					
Direct	$5,805,385	$6,921,067	$13,379,786	$0	$113,155,517
Indirect	$3,614,406	$1,495,851	$3,317,416	$3,260,105	$32,639,415
Induced	$1,817,025	$533,674	$1,762,644	$15,621,490	$24,413,952
Total	**$11,236,816**	**$8,950,592**	**$18,459,846**	**$18,881,595**	**$170,208,884**
Operations					
Direct	$256,251	$276,026	$533,651	$0	$5,206,915
Indirect	$43,601	$15,814	$32,391	$0	$2,489,283
Induced	$50,057	$14,631	$48,988	$549,745	$1,491,967
Total	**$349,909**	**$306,471**	**$615,030**	**$549,745**	**$9,188,165**

Tables 5.5 and 5.6 show the output impacts (economic output is the value of goods and services produced in the parish or state) from the transmission line for the parishes in Louisiana and the State of Louisiana during construction and operations. The local output during construction total over $24.7 million for Bienville Parish, over $113 million for De Soto Parish, over $17.4 million for East Carroll Parish, over $4.6 million for Franklin Parish, over $20 million for Jackson Parish, over $23.2 million for Ouachita Parish, over $15.7 million for Red River Parish, over $30.3 million for Richland Parish, and over $307 million for the State of Louisiana. The local long-term output from the Project total over $1.8 million for Bienville Parish, over $27.2 million for De Soto Parish, over $1.5 million for East Carroll Parish, over $414 thousand for Franklin Parish, over $2.5 million for Jackson Parish, over $1.4 million for Ouachita Parish, over $1.2 million for Red River Parish, over $2.6 million for Richland Parish, and over $47.6 million for the State of Louisiana.

Table 5.5 – Total Output Impact from the Southern Spirit Transmission Line for Louisiana Parishes

	Bienville Parish	De Soto Parish	East Carroll Parish	Franklin Parish	Jackson Parish
Construction					
Direct	$9,609,888	$57,130,843	$8,690,604	$1,971,080	$9,646,863
Indirect	$12,464,765	$43,414,643	$6,780,076	$1,757,692	$6,865,625
Induced	$2,693,487	$12,906,216	$1,980,458	$927,597	$3,576,770
Total	**$24,768,140**	**$113,451,702**	**$17,451,138**	**$4,656,369**	**$20,089,258**
Operations					
Direct	$1,762,992	$17,048,072	$1,442,436	$357,277	$1,503,421
Indirect	$72,867	$9,425,723	$96,383	$38,133	$940,216
Induced	$34,131	$792,451	$57,312	$19,415	$71,496
Total	**$1,869,990**	**$27,266,246**	**$1,596,131**	**$414,825**	**$2,515,133**

Table 5.6 – Total Output Impact from the Southern Spirit Transmission Line for Louisiana Parishes (Cont.)

	Ouachita Parish	Red River Parish	Richland Parish	Rest of Louisiana	State of Louisiana
Construction					
Direct	$5,805,385	$6,921,067	$13,379,786	$0	$113,155,517
Indirect	$11,451,499	$6,625,729	$10,556,476	$10,442,569	$110,359,073
Induced	$5,946,665	$2,250,561	$6,381,992	$46,956,418	$83,620,164
Total	**$23,203,549**	**$15,797,357**	**$30,318,254**	**$57,398,987**	**$307,134,754**
Operations					
Direct	$1,108,215	$1,140,154	$2,340,266	$0	$26,702,834
Indirect	$208,043	$78,403	$134,658	$0	$15,914,102
Induced	$163,370	$61,534	$176,222	$1,620,419	$4,994,576
Total	**$1,479,628**	**$1,280,091**	**$2,651,146**	**$1,620,419**	**$47,611,512**

Although the Southern Spirit Transmission Project is expected to last much longer, we can combine the construction impacts with the ongoing operations impact over a 40-year timeframe by adding the construction impacts and the annual impacts multiplied by 40. Table 5.7 shows the employment, total earnings and total output for Louisiana. The combined result shows 12,278 job-years resulting in over $537 million in total earnings and over $2.2 billion in total output for the State of Louisiana.

Table 5.7 – Combined Impact from the Southern Spirit Transmission Line during Construction and 40-year Operation for the State of Louisiana[6]

	Employment	Total Earnings	Total Output
Direct	7,855	$321,432,097	$1,181,268,861
Indirect	2,344	$132,210,766	$746,923,154
Induced	2,078	$84,092,629	$283,403,211
Total	**12,278**	**$537,735,492**	**$2,211,595,226**

[6] Policymakers may want to use a discount factor to weight future benefits over the next 40 years of operations with near-term benefits during construction. For simplicity, no such discount factor was used here.

VI. Property Taxes

Property taxes are an important funding source for education and other local government services, such as fire protection, park districts, and road maintenance. In most jurisdictions, local school districts receive about half of all property taxes to support K-12 education. In recognition of the difficulty in predicting future property tax rates over the decades of project operation, we have used the current rates published by the Louisiana Tax Commission and then applied a standard 0.25% rate increase across each jurisdiction to reflect future tax increases needed to account for the impact of inflation and growth on parish budgets.

There are several important assumptions built into our property tax calculations. Those assumptions are as follows:

- First, the tables assume that a converter station will be located at De Soto Parish.
- Second, the analysis assumes that costs for transmission lines will be distributed proportionally according to the line miles in each parish.
- Third, the analysis assumes an assessment ratio of 15% for Louisiana.
- Fourth, the analysis uses the most current millage rates published by the Louisiana Tax Commission for each jurisdiction as of the writing of this report (December 2022).
- Fifth, a rate escalation factor of 0.25% was applied annually to the millage rate.
- Sixth, no comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the economic impact of the Project.

Table 6.1 shows the total property tax revenue that is expected to be provided by Southern Spirit Transmission Line to the State of Louisiana. A conservative estimate of the total property taxes paid by the Project starts out at over $14.1 million in the first year and declines due to depreciation until it hits the bottom in 2050. The expected total property taxes paid to schools, county government and other taxing bodies over the 40-year lifetime of the Project is over $349 million in the State of Louisiana, and the average annual property taxes paid will be over $8.7 million.

Table 6.2 shows the likely taxes paid to Bienville, De Soto, East Carroll, Franklin, Jackson, Ouachita, Red River, and Richland Parishes. According to Table 6.2, the total amounts paid are over $26.5 million for Bienville Parish, over $212 million for De Soto Parish, over $26.5 million for East Carroll Parish, over $4.9 million for Franklin Parish, over $23 million for Jackson Parish, over $12.9 million for Ouachita Parish, over $17.3 million for Red River Parish, and over $26.4 million for Richland Parish over the life of the Project.

Table 6.1 – Total Tax Revenue from the Southern Spirit Transmission Line in Louisiana

Year	Total Taxes Paid
2027	$14,174,973
2028	$14,050,906
2029	$14,065,275
2030	$13,918,496
2031	$13,757,947
2032	$13,583,079
2033	$13,393,330
2034	$13,188,112
2035	$12,966,830
2036	$12,552,073
2037	$12,292,794
2038	$11,830,585
2039	$11,341,279
2040	$10,823,890
2041	$10,277,399
2042	$9,700,758
2043	$9,092,885
2044	$8,241,346
2045	$7,346,780
2046	$6,628,632
2047	$6,326,233
2048	$6,006,829
2049	$5,669,798
2050	$4,831,377
2051	$4,940,324
2052	$5,051,729
2053	$5,165,645
2054	$5,282,130
2055	$5,401,241
2056	$5,523,041
2057	$5,647,583
2058	$5,774,937
2059	$5,905,161
2060	$6,038,322
2061	$6,174,487
2062	$6,313,723
2063	$6,456,097
2064	$6,601,681
2065	$6,750,551
2066	$6,902,775
40-Year TOTAL	**$349,991,036**
Annual Average	**$8,749,776**

Table 6.2 – Total Tax Revenue from the Southern Spirit Transmission Line for Louisiana Parishes

Year	Bienville Parish	De Soto Parish	East Carroll Parish	Franklin Parish	Jackson Parish	Ouachita Parish	Red River Parish	Richland Parish
2027	$1,073,665	$8,598,911	$1,073,593	$199,158	$932,222	$524,545	$701,899	$1,070,980
2028	$1,064,268	$8,523,648	$1,064,197	$197,415	$924,062	$519,954	$695,756	$1,061,606
2029	$1,065,357	$8,532,365	$1,065,285	$197,617	$925,007	$520,485	$696,467	$1,062,692
2030	$1,054,239	$8,443,325	$1,054,168	$195,554	$915,354	$515,054	$689,199	$1,051,602
2031	$1,042,078	$8,345,932	$1,042,008	$193,299	$904,796	$509,113	$681,249	$1,039,472
2032	$1,028,833	$8,239,852	$1,028,764	$190,842	$893,296	$502,642	$672,590	$1,026,260
2033	$1,014,461	$8,124,744	$1,014,393	$188,176	$880,817	$495,620	$663,195	$1,011,924
2034	$998,917	$8,000,255	$998,850	$185,292	$867,320	$488,026	$653,033	$996,419
2035	$982,156	$7,866,020	$982,090	$182,183	$852,768	$479,837	$642,076	$979,700
2036	$950,741	$7,614,417	$950,677	$176,356	$825,491	$464,489	$621,538	$948,363
2037	$931,102	$7,457,132	$931,040	$172,713	$808,440	$454,895	$608,700	$928,773
2038	$896,093	$7,176,743	$896,032	$166,219	$778,042	$437,791	$585,813	$893,852
2039	$859,031	$6,879,918	$858,973	$159,345	$745,863	$419,684	$561,584	$856,882
2040	$819,842	$6,566,056	$819,787	$152,075	$711,837	$400,538	$535,964	$817,791
2041	$778,449	$6,234,540	$778,396	$144,397	$675,896	$380,315	$508,904	$776,502
2042	$734,772	$5,884,735	$734,722	$136,295	$637,974	$358,976	$480,350	$732,934
2043	$688,729	$5,515,983	$688,683	$127,755	$597,996	$336,482	$450,250	$687,007
2044	$624,230	$4,999,417	$624,188	$115,791	$541,995	$304,971	$408,085	$622,669
2045	$556,473	$4,456,750	$556,435	$103,222	$483,163	$271,867	$363,789	$555,081
2046	$502,077	$4,021,102	$502,044	$93,132	$435,934	$245,292	$328,229	$500,822
2047	$479,173	$3,837,660	$479,140	$88,883	$416,047	$234,102	$313,255	$477,974
2048	$454,980	$3,643,899	$454,949	$84,396	$395,041	$222,283	$297,439	$453,842
2049	$429,452	$3,439,448	$429,423	$79,660	$372,876	$209,811	$280,750	$428,378
2050	$365,947	$2,930,840	$365,922	$67,881	$317,737	$178,785	$239,234	$365,031
2051	$374,199	$2,996,930	$374,173	$69,411	$324,902	$182,817	$244,629	$373,263
2052	$382,637	$3,064,511	$382,611	$70,977	$332,229	$186,939	$250,145	$381,680
2053	$391,265	$3,133,616	$391,239	$72,577	$339,720	$191,155	$255,786	$390,287
2054	$400,088	$3,204,279	$400,061	$74,214	$347,381	$195,465	$261,554	$399,088
2055	$409,110	$3,276,535	$409,083	$75,887	$355,214	$199,873	$267,452	$408,087
2056	$418,336	$3,350,421	$418,308	$77,599	$363,225	$204,380	$273,483	$417,289
2057	$427,769	$3,425,973	$427,740	$79,348	$371,415	$208,989	$279,650	$426,699
2058	$437,415	$3,503,229	$437,386	$81,138	$379,791	$213,701	$285,956	$436,321
2059	$447,279	$3,582,227	$447,249	$82,967	$388,355	$218,520	$292,405	$446,160
2060	$457,365	$3,663,006	$457,334	$84,838	$397,112	$223,448	$298,998	$456,221
2061	$467,679	$3,745,607	$467,647	$86,751	$406,067	$228,487	$305,741	$466,509
2062	$478,225	$3,830,070	$478,193	$88,708	$415,224	$233,639	$312,635	$477,029
2063	$489,009	$3,916,438	$488,976	$90,708	$424,587	$238,908	$319,685	$487,786
2064	$500,036	$4,004,754	$500,002	$92,753	$434,162	$244,295	$326,894	$498,785
2065	$511,312	$4,095,061	$511,278	$94,845	$443,952	$249,804	$334,266	$510,033
2066	$522,842	$4,187,405	$522,807	$96,984	$453,963	$255,437	$341,803	$521,534
40-Year TOTAL	**$26,509,631**	**$212,313,751**	**$26,507,846**	**$4,917,361**	**$23,017,273**	**$12,951,414**	**$17,330,432**	**$26,443,327**
Annual Average	**$662,741**	**$5,307,844**	**$662,696**	**$122,934**	**$575,432**	**$323,785**	**$433,261**	**$661,083**

VII. References

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VIII. Curriculum Vitae (Abbreviated)

David G. Loomis
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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.

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.
- Published 38 articles in leading journals such as AIMS Energy, Renewable Energy, National Renewable Energy Laboratory Technical Report, Electricity Journal, Energy Economics, Energy Policy, and many others
- Testified over 57 times in formal proceedings regarding wind, solar and transmission projects
- Raised over $7.7 million in grants
- Raised over $2.7 million in external funding

Bryan A. Loomis
Strategic Economic Research, LLC
Vice President

Education

Master of Business Administration (M.B.A.), Marketing and Healthcare, Belmont University, Nashville, Tennessee, 2017.

Experience

2019-present Strategic Economic Research, LLC, Bloomington, IL
Vice President
(2021-present)
Property Tax Analysis and Land Use Director
(2019-2021)

- Directed the property tax analysis by training other associates on the methodology and overseeing the process for over twenty states
- Improved the property tax analysis methodology by researching various state taxing laws and implementing depreciation, taxing jurisdiction millage rates, and other factors into the tax analysis tool
- Executed land use analyses by running Monte Carlo simulations of expected future profits from farming and comparing that to the solar lease
- Performed economic impact modeling using JEDI and IMPLAN tools
- Improved workflow processes by capturing all tasks associated with economic modeling and report-writing, and created automated templates in Asana workplace management software

2019-2021 Viral Healthcare Founders LLC, Nashville, TN
CEO and Founder

- Founded and directed marketing agency for healthcare startups
- Managed three employees
- Mentored and worked with over 30 startups to help them grow their businesses
- Grew an email list to more than 2,000 and LinkedIn following to 3,500
- Created a Slack community and grew to 450 members
- Created weekly video content for distribution on Slack, LinkedIn and Email

Christopher Thankan
Strategic Economic Research, LLC
Economic Analyst

Education

Bachelor of Science in Sustainable & Renewable Energy (B.A.), Minor in Economics, Illinois State University, Normal, IL, 2021

Experience

2021-present Strategic Economic Research, LLC, Bloomington, IL
Economic Analyst

- Create economic impact results on numerous renewable energy projects Feb 2021-Present
- Utilize IMPLAN multipliers along with NREL's JEDI model for analyses
- Review project cost Excel sheets
- Conduct property tax analysis for different US states
- Research taxation in states outside research portfolio
- Complete ad hoc research requests given by the president
- Hosted a webinar on how to run successful permitting hearings
- Research school funding and the impact of renewable energy on state aid to school districts
- Quality check coworkers JEDI models
- Started more accurate methodology for determining property taxes that became the main process used

by Dr. David G. Loomis,
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