# Firefly Solar Projected Economic Impact (2024)

March 3, 2022



Farkert İbs

assess. analyze. assert!

# TABLE OF CONTENTS

INTRODUCTION	3
METHODOLOGY & KEY ASSUMPTIONS	4
PROJECTED IMPACTS ON LAWRENCE COUNTY ECONOMY	5
PROJECTED CONSTRUCTION IMPACTS	5
PROJECTED IMPACT OF LANDOWNER PAYMENTS	6
PROJECTED OPERATIONAL IMPACTS	7
PROJECTED STATE AND LOCAL TAX IMPACT	8
APPENDIX A: TERMS AND DEFINITIONS	9
APPENDIX B: METHODOLOGY	10
APPENDIX C: FREQUENTLY ASKED QUESTIONS	12

# INTRODUCTION

Firefly Solar is a utility-scale solar project being developed by Vesper Energy (formerly Lendlease Energy Development), a renewable energy company that partners with local landowners develop to and operate solar and energy storage projects across the country. The Vesper team has successfully commercialized more than 680 MW of renewable energy projects in the U.S. and is currently developing similar projects in other states.



Firefly Solar is a planned 200 megawatt (MW) solar project to be located in Lawrence County/North Beaver Township that would generate positive economic and employment impacts for the region. It is projected that Firefly Solar will generate \$51.6 million during the construction phase for Lawrence County, \$8.7 million annually during operations, and \$1.6 million in state and local taxes due to operations each year.

In January 2022, Vesper Energy engaged <u>Parker Philips Inc.</u> to measure the projected economic impact of its proposed solar project – Firefly Solar. Parker Philips is a nationally recognized consulting firm with headquarters in Erie, Pennsylvania, with offices in Philadelphia and Ohio. Parker Philips has completed more than 600 economic impact analysis projects across the U.S. and globally. The goal of this analysis is to provide a complete assessment of the estimated total economic, employment, and state and local tax impact of the project on Lawrence County. The primary tool used in the performance of this study is the I-O model and dataset, which is the leading economic modeling application in the U.S., developed by IMPLAN Group LLC. Please find more information about the I-O model in Appendix B: Methodology. Project-specific data including projected operational and capital expenditures used in this study was obtained from Vesper Energy. Additional information on the methodology and assumptions used to

complete this study can be found in Appendix B.

# **METHODOLOGY & KEY ASSUMPTIONS**

An economic impact analysis quantifies the effect of an event on the economy in a specified geography. An economic impact analysis is commonly conducted when

there is public interest in the potential impacts of a proposed change of policy, to demonstrate the value of aproject, or to show the contribution of an existing organization in the market. This economic impact analysis shows the estimated economic, employment, and local and state tax impact of the proposed Firefly Solar project in Lawrence County and North Beaver Township.



The combination of indirect and induced impact is commonly referred to as the multiplier effect. Quantifying the economic impacts of Firefly Solar is essential to understanding

the potential benefits that the project could have on the local economy. Solar power development, like other commercial development projects, can expand the local economy through both direct and indirect means. Income generated from direct employment during the construction and operation phases of the solar project is subsequently used to purchase local goods and services, creating a ripple

# TERMS to KNOW



#### Direct

These are the direct impacts experienced by the companies engaged in the construction and operation of Firefly Solar. This value estimates the dollars spent by project developers, consultants, and construction contractors, as well as and operation and maintenance personnel.

#### Indirect

Local revenue and supply chain impacts: These impacts measure the estimated increase in demand for goods and services in industry sectors that supply or otherwise support the companies engaged in construction and operation working on Project Firefly.

#### Induced

Represents the third wave of impact and measure the estimated effect of increased household income resulting from the project. Induced impacts reflect the reinvestment of earned wages, as measured throughout the first two levels of economic impact. This reinvestment can occur anywhere within the economy, on household goods, entertainment, food, clothing, transportation, and other household goods. effect throughout Lawrence County.

# PROJECTED IMPACTS ON LAWRENCE COUNTY ECONOMY

# **Projected Construction Impacts**

Based upon IMPLAN model calculations, it is anticipated that over the approximately 18month construction period, the project will support **315 jobs** and generate **\$51.6 million** in economic impact. The project will support **\$19.8 million in labor income**. This assumes that only 15% of the construction project budget will be spent in Lawrence County. Local employment will primarily benefit those in the construction trades, including equipment operators, truck drivers, laborers, and electricians.



Projected Jobs, Labor Income, and Economic Impact of Firefly Solar: Construction

IMPACT	EMPLOYMENT	LABOR INCOME	OUTPUT
Direct	223 jobs	\$15,181,527	\$37,184,299
Indirect	40 jobs	\$2,381,041	\$7,102,337
Induced	52 jobs	\$2,265,401	\$7,328,511
Total	315 jobs	\$19,827,969	\$51,615,147

Source: Parker Philips using data from Vesper Energy

# Projected Impact of Landowner Payments

Landowner payments to private citizens who choose to sign on to participate in Firefly Solar are important to showcase within this economic impact study because they impact the household spending power of Lawrence County residents. In exchange for allowing the siting of solar panels, access roads, and/or other project components on their land, landowners will be compensated with construction payments, as well as annual operational payments. The money from these payments, like the other expenditures



associated with Firefly Solar, will be spent in the local economy thereby generating additional impact on the community as a whole as a result of their household spending.

The landowner payment analysis is a household spending impact. The impact of increased household spending will generate nearly **\$1.1 million** in economic impact for a 200 MW project, support and sustain **7 jobs**, and contribute **\$110,470 in state and local taxes** during construction. Over 40 years, landowners will generate **\$26.7 million** in economic output, support and sustain **186 jobs** and contribute **\$2.5 million in state and local taxes**.

#### PROJECTED IMPACTS on HOUSEHOLDS in LAWRENCE COUNTY from LANDOWNER PAYMENTS

IMPACT	EMPLOYMENT LABOR INCOME		OUTPUT	
Landowner Construction Payments Impact	7 jobs	\$326,098	\$1,068,072	
Landowner Operational Payments Impact (40 Years)	186 jobs	\$8,152,455	\$26,701,798	
	Source: Parker Philips using data from Vesper Energy			

#### PROJECTED STATE and LOCAL TAX IMPACTS on HOUSEHOLDS in LAWRENCE COUNTY from LANDOWNER PAYMENTS

IMPACT	SUB COUNTY GENERAL	SUB COUNTY SPECIAL DISTRICT	COUNTY	STATE	TOTAL
Landowner Construction Payments Impact	\$9,283	\$24,663	\$11,887	\$64,641	\$110,474
Landowner Operational Payments Impact (40 Years)	\$232,087	\$616,571	\$297,168	\$1,366,017	\$2,511,843
			Source: Parker Philips using data from Vesper Energy		

# **Projected Operational Impacts**

Based upon IMPLAN model calculations, it is anticipated that Firefly Solar will generate **\$8.7 million** in the Lawrence County economy annually, support and sustain 9 total jobs, and support **\$1.3 million in labor income**<sup>1</sup>. These impacts will repeat each year in Lawrence County.



TOTAL ECONOMIC OUTPUT: \$8,675,604 Source: Parker Philips using data from Vesper Energy

# PROJECTED OPERATIONAL IMPACT of FIREFLY SOLAR

IMPACT	EMPLOYMENT	LABOR INCOME	OUTPUT
Direct	3 jobs	\$616,418	\$4,828,534
Indirect	3 jobs	\$530,029	\$3,415,411
Induced	3 jobs	\$133,612	\$431,659
Total	9 jobs	\$1,280,059	\$8,675,604

Projected Jobs, Labor Income, and Economic Impact of Firefly Solar: Operations

Source: Parker Philips using data from Vesper Energy

<sup>&</sup>lt;sup>1</sup> Labor Income is made up of two parts. 1) employee compensation which is the total payroll cost of wage and salary employees to Vesper Energy. It includes wages and salaries, all employee benefits (for example, health, dental, retirement, vacation) and payroll taxes (both sides of social security, unemployment insurance taxes, etc.). in other words, a fully loaded payroll; and 2) proprietor income which consists of payments received by self-employed individuals and unincorporated business owners. It represents the current-production income of sole proprietorships, partnerships, and tax-exempt cooperatives.

# PROJECTED STATE AND LOCAL TAX IMPACT

State and local tax impacts generated based on operations will total **\$1.6 million** annually, inclusive of direct, indirect, and induced impacts. Of this \$1.6 million, **\$748,333** will be generated in local taxes only. Taxes at the local level include sales tax and property tax. IMPLAN calculates taxes based upon actual taxes paid in a data year rather than tax rates. Calculations in this analysis are based upon the most recent tax year of 2020. Using this data, it is estimated that Firefly Solar would be expected to generate **\$267,351** in direct property taxes annually.

In Pennsylvania, property taxes are administered at the county level. In every county, the sum of local tax rates (school taxes, municipal taxes, and county taxes) is applied to the assessed value of each property. The median property tax in Lawrence County is \$1,436 per year for a home worth the median value of \$92,600. On average, the County collects 1.55% of a property's assessed fair market value as property tax. On average, residents of the County pay 2.94% in their annual income in property tax. Lawrence County is ranked 636th of the 3143 counties for property taxes as a percentage of median income. In Lawrence County, the average 2022 millage rate is 15.672 for school taxes (1.57% of assessed property value) and 0.4646 for fire (0.05%) of assessed property value.<sup>2</sup> In North Beaver Township, the average 2022 millage rate is 14.37 for school taxes (1.44% of assessed property value) and .33 for fire (.03%) of assessed property value.<sup>3</sup>

# PROJECTED STATE and LOCAL TAX IMPACT of FIREFLY SOLAR

			•		•
IMPACT	SUB COUNTY GENERAL	SUB COUNTY SPECIAL DISTRICTS	COUNTY	STATE	TOTAL
Direct	\$75,888	\$616,418	\$104,528	\$435,333	\$828,275
Indirect	\$65,425	\$530,029	\$90,088	\$372,542	\$711,237
Induced	\$3,405	\$133,612	\$4,314	\$20,181	\$36,877
Total	\$144,718	\$1,280,059	\$198,930	\$828,056	\$1,576,389

Projected Jobs, Labor Income, and Economic Impact of Firefly Solar: Operations

Source: Parker Philips using data from Vesper Energy

<sup>&</sup>lt;sup>2</sup> Source: https://lawrencecountypa.gov

<sup>&</sup>lt;sup>3</sup> Source: https://lawrencecountypa.gov

# Appendix A: Terms and Definitions

Data Year - 2020

**Direct Employment** – Total number of employees, both full-time and part-time, at the organization based on total jobs, not FTEs.

**Direct Impact –** All direct expenditures made by an organization due to its operating expenditures. These include operating expenditures and pay and benefits expenditures. **Dollar Year** – Presented in 2024 dollars

**Government Revenue/State and Local Tax Impact** – Government revenue or tax revenue that is collected by governmental units at the state and local level in addition to those paid directly by an organization. This impact includes taxes paid directly by the organization itself, employees of the organization and vendors who sell products to the organization and at the household level.

**Indirect Employment** – Additional jobs created because of an organization's economic impact. Local companies or vendors that provide goods and services to an organization increase their number of employees as purchasing increases, thus creating an employment multiplier.

**Indirect Impact** – The indirect impact includes the impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money is spent outside of the local economy, either through imports or by payments to value added (multiplier effect).

**Induced Employment** – Additional jobs created because of household spending by employees of an organization and the employees of vendors. This is another wave of the employment multiplier.

**Induced Impact** – The response by an economy to an initial change (direct effect) that occurs through re-spending of income received by a component of value added. IMPLAN's default multiplier recognizes that labor income (employee compensation and proprietor income components of value added) is not lost to the regional economy. This money is recirculated through household spending patterns causing further local economic activity (multiplier effect).

**Multiplier Effect** – The multiplier effect is the additional economic impact created as a result of the organization's direct economic impact. Local companies that provide goods and services to an organization increase their purchasing by creating a multiplier (indirect/supply chain impacts). Household spending generated by employees of the organization and the organization's suppliers create a third wave of multiplier impact (induced/household spending impacts).

Study Year - 2024

# Appendix B: Methodology

Primary data used in this study was collected from Vesper Energy. This data was utilized to complete the input-output models as developed by IMPLAN. This model and its economic findings are a conservative estimate of impact and based on actual financial information.

## OVERVIEW AND THE IMPLAN MODEL

The most common and widely accepted methodology for measuring the economic impacts of economic sectors is input-output (I-O) analysis. At its core, an I-O analysis is a table that records the flow of resources to and from companies/ organizations and individuals within a region at a given time. For a specified region like a state or the nation, the input-output table accounts for all dollar flows between different sectors of the economy in a given time period. With this information, a model can then follow how a dollar added into one sector is spent and re-spent in other sectors of the economy, generating outgoing ripples of subsequent economic activity. This chain of economic activity generated by one event is called the "economic multiplier" effect.

The primary tool used in the performance of this study is the I-O model and dataset developed and maintained by IMPLAN Group LLC (formerly Minnesota IMPLAN Group, Inc.).IMPLAN is a widely accepted and used software model first developed by the U.S. Forest Service in 1972. The data used in the baseline IMPLAN model and dataset come largely from federal government databases. The input-output tables themselves come from the Bureau of Economic Analysis. Much of the annual data on labor, wages, seasonal demand and other market data comes from the Bureau of Labor Statistics, the Census Bureau, and other government sources.

Government agencies, companies, and researchers use IMPLAN to estimate the economicactivities associated with spending in a particular industry or on a particular project. The IMPLAN model extends conventional I-O modeling to include the economic relationships between government, industry and household sectors, allowing IMPLAN to model transfer payments such as taxes.

The model works by tracking the flow of resources to and from companies/ organizations and individuals within a region. Producers of goods and services must secure labor, raw materials, and other services to produce their product. The resources transferred to the owners of that labor, or those raw materials and services are then spent to secure additional goods and services or inputs to the products they sell. For example, an organization in a region may develop a company that produces cars with a value of \$1 million. However, to produce that product, they may be required to spend \$500,000 in wages and benefits, \$200,000 to suppliers of parts, \$100,000 for electricity, \$50,000 for transportation of goods and raw materials to and from the plant, and \$50,000 in various professional services associated with operating a business (e.g., attorneys and accountants). The suppliers will, in turn, spend those resources on labor and raw materials necessary to produce the trains. Workers and the owners of the company will buy goods and services from other companies in the area (e.g., restaurants, gas stations, and taxes). The suppliers, employees, and owners of this second tier will, in turn, spend those resources on other goods and services either within thestudy region or elsewhere. The cycle continues until all the money leaves the region.

#### IMPLAN METHODOLOGY

The model uses national production functions for over 536 industries to determine how an industry spends its operating receipts to produce its commodities. These production functionsare derived from U.S. Census Department data. IMPLAN couples the national production functions with a variety of county-level economic data to determine the impacts at a state and congressional district level. To estimate these regional impacts, IMPLAN combines national industry production functions with county-level economic data. IMPLAN collects data from a variety of economic data sources to generate average output, employment, and productivity for each industry in a given county. IMPLAN combines this data to generate a series of economic multipliers for the study area. The multiplier measures the amount of total economic activity generated by a specific industry's spending an additional dollar in the study area. Based on these multipliers, IMPLAN generates a series of tables to show the economic event's direct, indirect, and induced impacts to gross receipts, or output, within each of the model's more than 536 industries.

# Appendix C: Frequently Asked Questions

## WHAT IS AN ECONOMIC IMPACT ANALYSIS?

The study quantifies the projected economic impact of Firefly Solar in terms of economic impact, jobs, and local and state tax revenue. The study calculates how the proposed project will contribute to the economy of Lawrence County, PA/North Beaver Township. It examines how expenditures create additional impact in the economy both directly and through the multiplier. An economic impact analysis quantifies how economic activity cycles through an existing economy. For the purposes of this study, an economic impact is defined as the gross changes in Lawrence County, PA's existing economy that can be attributed to Firefly Solar. This descriptive analysis tracks gross economic activity: how spending by Vesper Energy and its constituencies cycle dollars through the economy.

#### WHAT SHOULD YOU REMEMBER ABOUT THE STUDY WHEN YOU READ IT?

- It is a point-in-time calculation of impact in 2024 dollars.
- It quantifies the projected amount of impact that Firefly Solar will produce each year.
- The economic numbers can fluctuate year to year based on operational spending, capital spending, pay and benefits, actual direct tax payments, and number of employees.
- These are conservative numbers and adhere to industry-respected protocols.

### WHAT METHODOLOGY WAS USED TO COMPLETE THIS STUDY?

IMPLAN data and software were used to conduct this economic contribution analysis. The IMPLAN database is built using county, state, ZIP code and federal economic statistics that are specialized by region, not estimated from national averages, to measure the contribution or impact of an organization's economic activity.

### WHAT WERE THE MULTIPLIERS FOR THIS STUDY?

The multipliers used in this study range from 1.2 to 1.7. The multipliers are derived through the input-output models created using the IMPLAN software based upon industries selected during the modeling process.

### WHAT DATA DOES THIS STUDY USE TO CALCULATE THE ECONOMIC IMPACT?

Primary data used in this analysis was obtained from the Vesper Energy and included financial data for Firefly Solar related to construction, operations, and landowner payments.

### WHY DID VESPER ENERGY COMMISSION A STUDY?

Vesper Energy commissioned the analysis to show the projected impact of Firefly Solar on the Lawrence County economy.