

# WOLF HILLS SOLAR

## ECONOMIC & FISCAL CONTRIBUTION TO WASHINGTON COUNTY, VIRGINIA



Prepared for

 Catalyst Energy

**MANGUM**   
economics

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## About Mangum Economics, LLC

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Mangum Economics was founded in 2003 and since then, we have become known as a leader in industry analysis, economic impact assessment, policy and program evaluation, and economic and workforce strategy development. The Mangum Team specializes in producing objective and actionable quantitative economic research that our clients use for strategic decision making in a variety of industries and environments. We know that our clients are unique, and that one size does not fit all. As a result, we have a well-earned reputation for tailoring our analyses to meet the specific needs of specific clients, with a specific audience.

Most of our research falls into four general categories:

- **Economic Development and Special Projects:** The Mangum Team has performed hundreds of analyses of proposed economic development projects. One recent example was an analysis of the proposed \$2.3 billion Green City “net-zero eco district.” The Mangum Team has also authored multiple economic development plans, including identifying industry recruitment opportunities created by the high-speed MAREA and BRUSA sub-sea cable landings in Virginia Beach.
- **Energy:** The Mangum Team has produced analyses of the economic and fiscal impact of over 29 GW of proposed solar, wind, battery energy storage, and hydro projects spanning twenty-seven states. Among those projects was Dominion’s 2.6 GW Coastal Virginia Offshore Wind project off of Virginia Beach. In addition, the Mangum Team has also performed economic and fiscal impact analyses for the natural gas, nuclear, oil, and pipeline industries.
- **Advanced Applied Technology:** The Mangum Team specializes in analyzing how advanced technology developments (like data centers, fiber networks, and advanced manufacturing plants) contribute to the state and local economies. We have worked with local governments, trade associations, developers, and operating firms across the country to show how investments in advanced critical infrastructure transform local economies across the country.
- **Policy Analysis:** The Mangum Team also has extensive experience in identifying and quantifying the intended and unintended economic consequences of proposed legislative and regulatory initiatives.

### The Project Team

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## Executive Summary

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This report assesses the economic and fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County, Virginia. The primary findings from that assessment are as follows:

- 1) **Wolf Hills Solar is a proposed 262-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located northwest of I-81 in Washington County, Virginia. The total acreage to be leased and purchased for the project encompasses approximately 1,900 acres of land used for cattle grazing. The actively used, fenced-in portion of the solar site would be approximately 1,575 acres.**
  
- 2) **The proposed Wolf Hills Solar project would make a significant economic contribution to Washington County:**
  - The proposed Wolf Hills Solar project would employ approximately 890 local and non-local full-time equivalent construction workers over a representative 12-month construction period.<sup>1</sup>
  - The proposed Wolf Hills Solar project would provide an estimated one-time pulse of economic activity to Washington County during its construction phase supporting approximately:<sup>2,3</sup>
    - 147 direct and 115 indirect and induced job years.
    - \$14.7 million in associated wages and benefits.
    - \$64.3 million in economic output.
  - The proposed Wolf Hills Solar project would provide an estimated annual economic impact to Washington County during its ongoing operational phase supporting approximately:<sup>4</sup>
    - 3 direct and 9 indirect and induced jobs.
    - \$0.8 million in associated wages and benefits.
    - \$2.9 million in economic output.

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<sup>1</sup> Please note that actual construction would take approximately 20 to 25 months but for ease of explication, the analysis is modeled based on a representative 12-month period.

<sup>2</sup> Please note that construction sector jobs are not necessarily new jobs, but the investments made can also support an existing job during the construction of the project. Additionally, it is important to note that it is not possible to know with certainty what proportion of jobs would go to county construction contractors or be filled by county residents.

<sup>3</sup> A construction sector job, also referred to as a job year, is equal to one job over one year. It is used to denote employment on construction projects where the construction schedule is not exactly one year and to account for the fact that actual on-site employment may vary over the period.

<sup>4</sup> Please note that the analysis excludes the impact of vegetative maintenance or agrivoltaics operations.

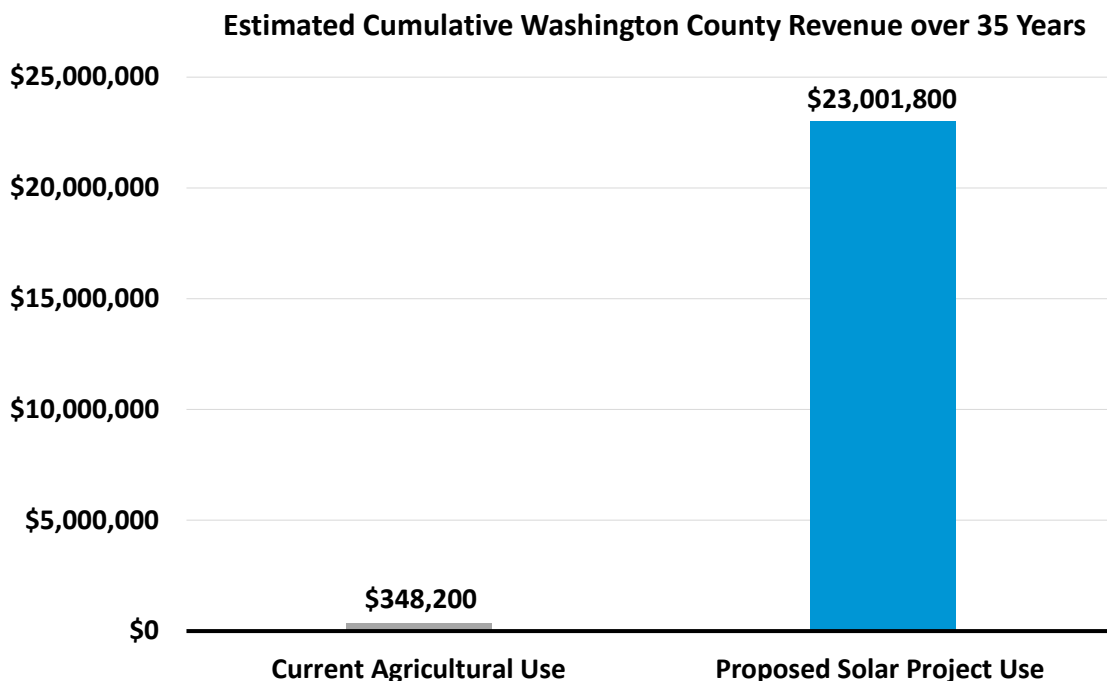


**3) The proposed Wolf Hills Solar project would also make a significant fiscal contribution to Washington County. The proposed project would generate approximately:<sup>5</sup>**

- \$2.6 million in state and local tax revenue from the one-time pulse of economic activity associated with the project’s construction.
- \$23.0 million in cumulative county revenue over the facility’s anticipated 35-year operational life assuming revenues are generated from the reassessment of the real property and payments associated with a locally adopted revenue share ordinance. The payments would be based on the project’s generation capacity and would include a 10 percent escalator every five years pursuant to passed legislation.

**4) The proposed Wolf Hills Solar project would have a significantly greater fiscal impact on Washington County than the property generates in its current use:**

- The proposed Wolf Hills Solar project would generate approximately \$23.0 million in cumulative county revenue over the facility’s anticipated 35-year operational life, as compared to approximately \$0.3 million in cumulative county revenue in the property’s current use – a difference of approximately \$22.7 million or a 66-fold increase over current revenues.



<sup>5</sup> Please note that fiscal impact estimates are subject to change based on final design, layout, and size of the project.

**5) The proposed Wolf Hills Solar project would provide a boost to Washington County's construction sector:**

- At 646 jobs, construction is Washington County's sixth largest major industry sector, and it pays average weekly wages (\$942 per week) that are 10 percent above the countywide average (\$858 per week).<sup>6</sup>
- Additionally, the construction sector posted the fourth largest job gain of any industry sector in the county between 2021 and 2022 (a gain of 61 jobs).<sup>7</sup>
- The proposed Wolf Hills Solar project could directly support approximately 147 jobs and \$9.9 million in wages and benefits to Washington County's construction sector.

*The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.*

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<sup>6</sup> Data Source: U.S. Bureau of Labor Statistics.

<sup>7</sup> Data Source: U.S. Bureau of Labor Statistics.





# Introduction

This report assesses the economic and fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County, Virginia. This report was commissioned by Catalyst Energy Partners and produced by Mangum Economics.

## The Project

Wolf Hills Solar is a proposed 262-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located northwest of I-81 in Washington County, Virginia. The total acreage to be leased and purchased for the project encompasses approximately 1,900 acres of land used for cattle grazing. The actively used, fenced-in portion of the solar site would be approximately 1,575 acres.

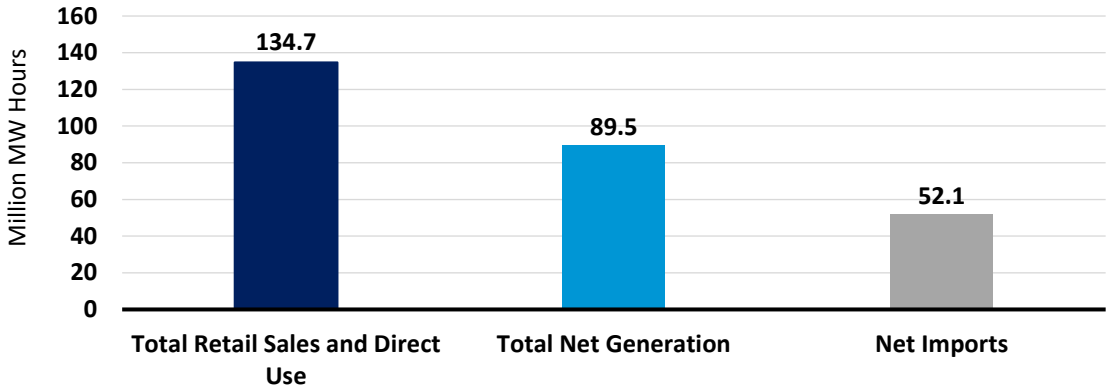
## Electricity Production in Virginia

This section provides a backdrop for the proposed Wolf Hills Solar project by profiling Virginia’s electricity production sector and the role that solar energy could play in that sector.

### Overall Market

As shown in Figure 1, in 2022 electricity sales and direct use in Virginia totaled 134.7 million megawatt hours. However, only 66 percent of that demand was met by in-state utilities, independent producers, and other sources. As a result, Virginia had to import the remaining electricity it consumed from producers in other states. As with all imports, this means that the jobs, wages, and economic output created by that production went to localities in those states, not to localities in Virginia.

Figure 1: Demand and Supply of Electricity in Virginia in 2022 (in millions of megawatt-hours)<sup>8</sup>



<sup>8</sup> Data Source: U.S. Energy Information Administration. In this chart, “Net Imports” also takes into account losses during transmission. As a result, it does not directly equal the residual of “Total Net Generation” minus “Total Retail Sales and Direct Use.”



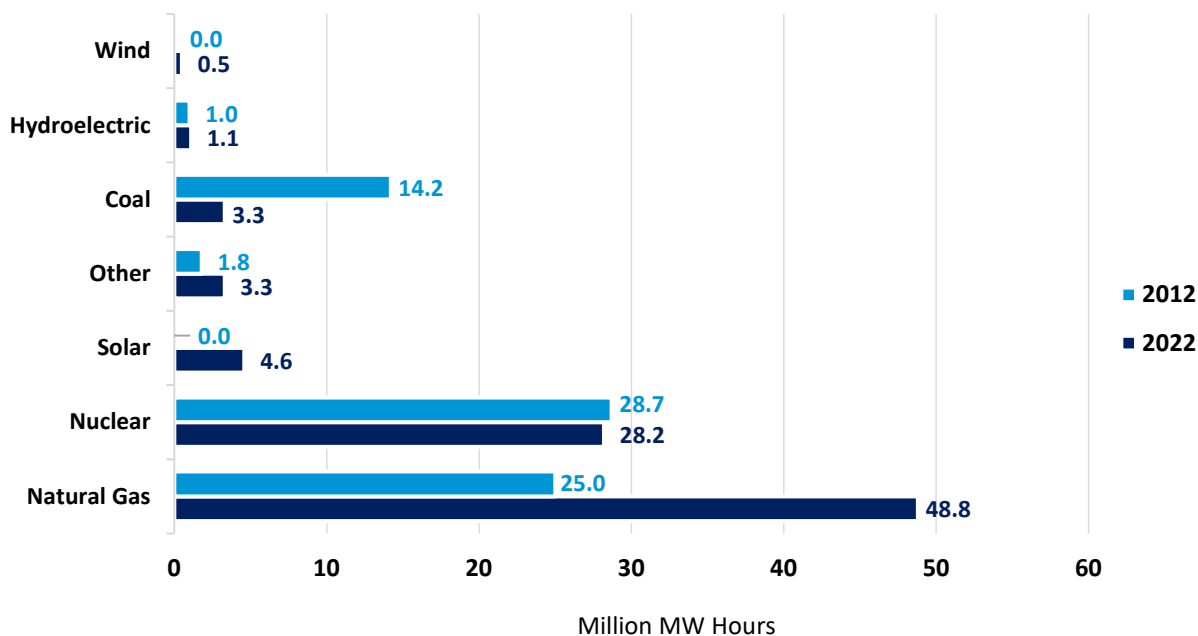
## Sources of Production

Between 2012 and 2022, the total amount of electricity produced in Virginia increased from 70.7 to 89.5 million megawatt hours, while retail and direct consumption of electricity increased from 109.9 to 134.7 million megawatt hours. Consequently, imports of electricity increased by 5.3 million megawatt hours (or 11 percent) during this time.<sup>9</sup> Figure 2 provides a comparison of the energy sources that were used to produce electricity in Virginia in each of those years. As these data show, the most significant change between 2012 and 2022 was a decrease in the use of coal and an increase in the use of natural gas.

Where coal was the state’s third largest source of electricity in 2012, accounting for 14.2 million megawatt hours (or 20 percent) of production, by 2022 production had fallen by 10.8 million megawatt hours, making coal a fourth-place source of electricity with only 4 percent of production.

In contrast, the share of electricity produced using cleaner-burning low-emissions energy sources increased over the period. Where natural gas accounted for 25.0 million megawatt hours (or 35 percent) of Virginia’s electricity production in 2012, by 2022 that proportion had almost doubled to 48.8 million megawatt hours (or 55 percent of production), making natural gas the state’s largest source of electricity. In addition, solar, which entered the Virginia electricity production market in 2016, increased its share to 4.6 million megawatt hours in 2022.

Figure 2: Electricity Generation in Virginia by Energy Source in 2012 and 2022 (in millions of megawatt-hours)<sup>10</sup>



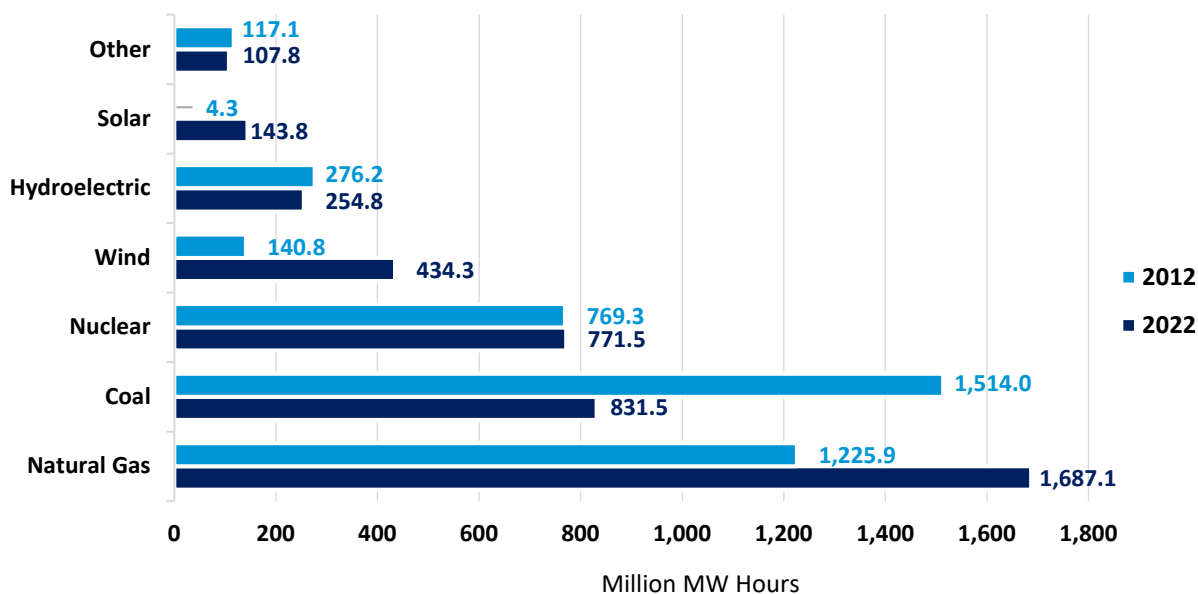
<sup>9</sup> Imports also takes into account losses during transmission. As a result, totals do not equal sum of components.

<sup>10</sup> Data Source: U.S. Energy Information Administration. The “Other” category includes battery, wood, petroleum, other biomass, “other”, and pumped storage.



Figure 3 provides similar data for the U.S. as a whole. A quick comparison of Figures 2 and 3 shows that although the degree of reliance on specific energy sources for electricity production is quite different between the U.S. and Virginia, the trend toward lower-emissions energy sources is the same. Nationally, between 2012 and 2022 the amount of electricity produced using coal declined by 682.5 million megawatt hours from 37 to 20 percent of production, while in contrast the amount of electricity produced using natural gas increased by 461.2 million megawatt hours from 30 to 40 percent of production. Nationwide, as in Virginia, the reliance on renewable energy sources such as solar increased during this time but at a slower pace than in Virginia. Between 2012 and 2022, the amount of electricity produced using solar increased by 139.5 million megawatt hours to 3 percent of total electricity production in the nation compared to 5 percent of total electricity production in Virginia.

**Figure 3: Electricity Generation in the United States by Energy Source in 2012 and 2022 (in millions of megawatt-hours)<sup>11</sup>**



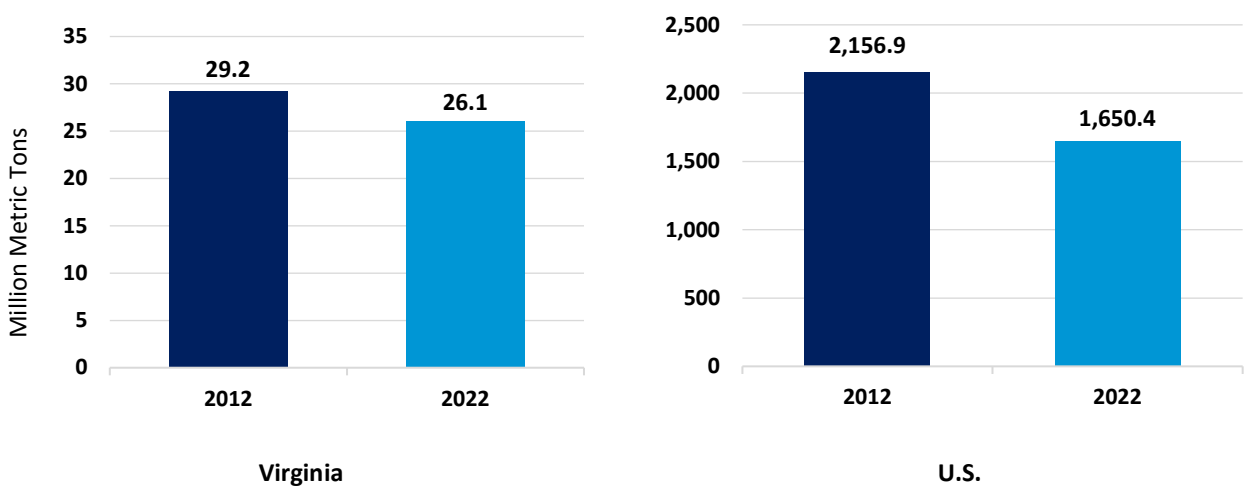
## Impact on the Environment

In discussing the impact of these trends on the environment, it is important to realize that electricity production is one of the U.S.’s largest sources of greenhouse gas emissions. Figure 4 depicts carbon dioxide emissions from electricity production in 2012 and 2022 for both Virginia and the U.S. As these data indicate, between 2012 and 2022, as the share of electricity produced in Virginia by coal fell from 20 to 4 percent, carbon dioxide emissions from electricity production fell from 29.2 to 26.1 million metric tons (an 11 percent decrease). Where at the national level, as the share of electricity produced by coal fell from 37 to 20 percent, carbon dioxide emissions from electricity production fell from 2,156.9 to 1,650.4 million metric tons (a 23 percent decrease).

<sup>11</sup> Data Source: U.S. Energy Information Administration. “Other” includes battery, geothermal, other, other biomass, other gas, petroleum, pumped storage, and wood.



Figure 4: Carbon Dioxide Emissions from Electricity Production (millions of metric tons)<sup>12</sup>

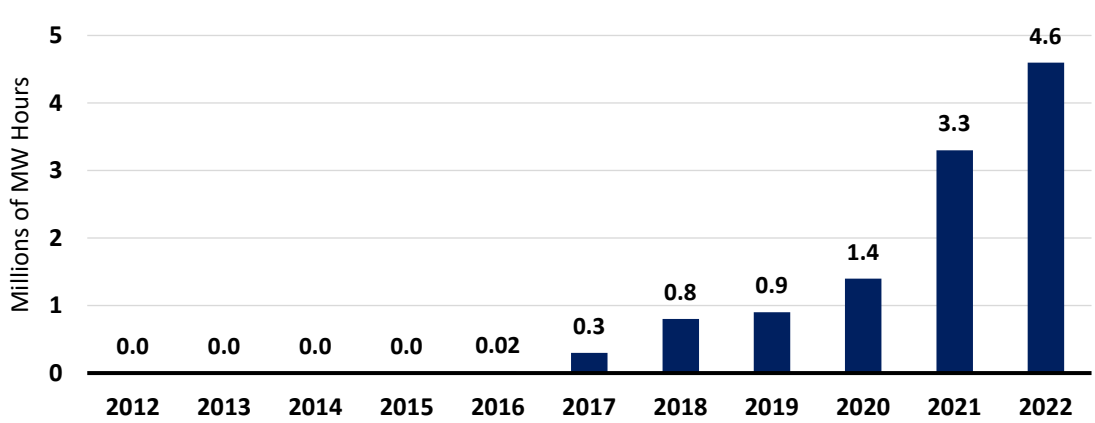


### Virginia Solar Industry Trends

As of the fourth quarter of 2023, Virginia was ranked 11<sup>th</sup> in the nation for its total installed solar capacity. Over the next five years, Virginia is projected to add almost seven thousand megawatts of solar to its portfolio, ranking it 9<sup>th</sup> in the nation for projected growth. Total investment into the solar industry in Virginia as of the fourth quarter of 2023 amounts to \$5.7 billion.<sup>13</sup>

Figure 5 depicts the progression of solar energy generation in Virginia from 2012 to 2022 expressed in millions of megawatt-hours. Solar entered the electricity market in Virginia in 2016 with 0.02 million megawatt hours. Generation has continued to grow throughout the period, reaching its peak, so far, in 2022, with solar generation totaling 4.6 million megawatt-hours.<sup>14</sup>

Figure 5: Solar Generation in Virginia (in millions of megawatt-hours) – 2012 to 2022<sup>15</sup>



<sup>12</sup> Data Source: U.S. Energy Information Administration.

<sup>13</sup> Data Source: Solar Energy Industries Association.

<sup>14</sup> Data Source: Solar Energy Industries Association.

<sup>15</sup> Data Source: U.S. Energy Information Administration.



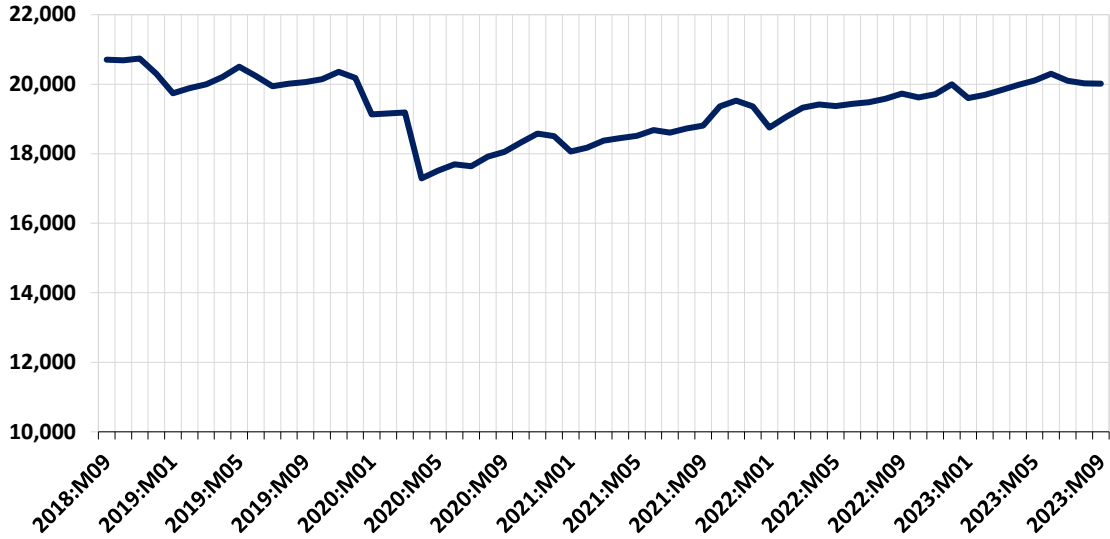
# Local Economic Profile

This section provides context for the economic and fiscal impact assessments to follow by profiling the local economy of Washington County.

## Total Employment

Figure 6 depicts the trend in total employment in Washington County during the five-year period from September 2018 through September 2023. Aside from seasonal fluctuations, employment in the county slowly trended downwards until April 2020, when employment declined significantly in response to a decrease in economic activity associated with the COVID-19 pandemic. Total employment has since recovered to pre-pandemic levels. As of September 2023, total employment in the county stood at 20,012, which represents an overall decrease in employment of 3.4 percent (or 697 jobs) over the five-year period. To put this number in perspective, over this same period, total statewide employment in Virginia increased by 4.2 percent.<sup>16</sup>

Figure 6: Total Employment in Washington County – September 2018 to September 2023<sup>17</sup>

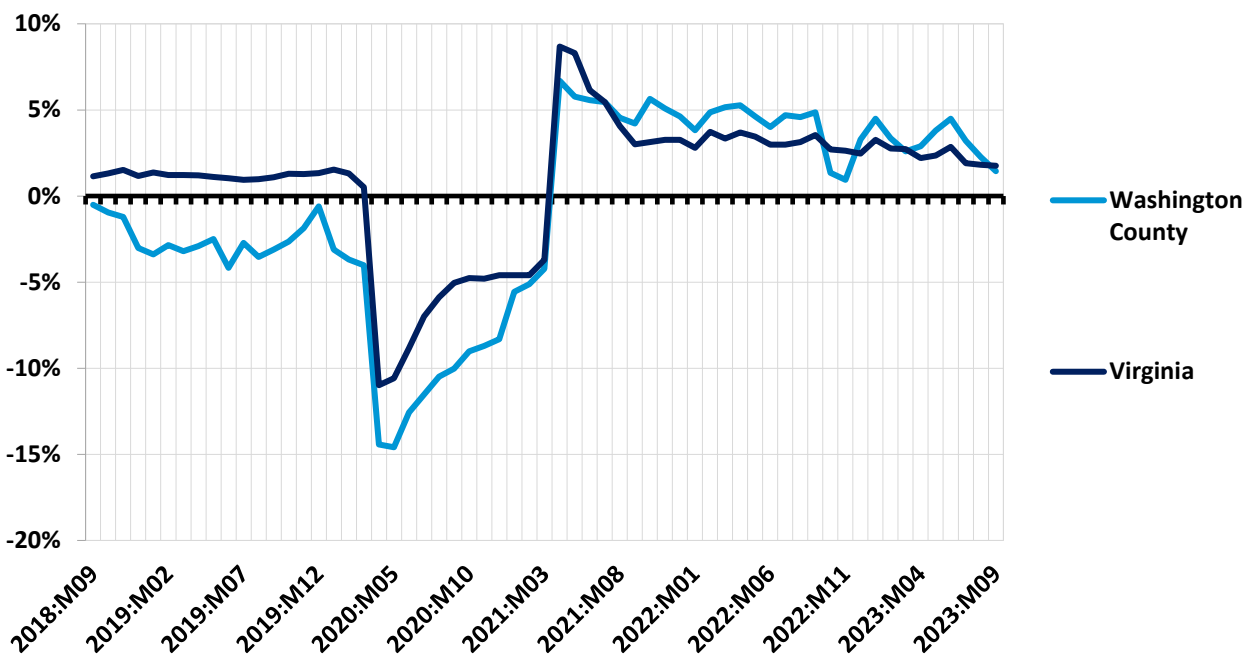


To control for seasonality and provide a point of reference, Figure 7 compares the year-over-year change in total employment in Washington County to that of the state of Virginia over the same five-year period. Any point above the zero line in this graph indicates an increase in employment, while any point below the zero line indicates a decline in employment. As these data show, Washington County was generally below the statewide average until August 2021. As of September 2023, the year-over-year change in total employment in Washington County was 1.4 percent as compared to 1.8 percent statewide in Virginia.

<sup>16</sup> Data Source: U.S. Bureau of Labor Statistics.  
<sup>17</sup> Data Source: U.S. Bureau of Labor Statistics.



Figure 7: Year-Over-Year Change in Total Employment – September 2018 to September 2023<sup>18</sup>



## Employment and Wages by Industry Supersector

To provide a better understanding of the underlying factors motivating the total employment trends depicted in Figures 6 and 7, Figures 8 through 10 provide data on private employment and wages in Washington County by industry supersector.<sup>19</sup>

Figure 8 provides an indication of the distribution of private sector employment across industry supersectors in Washington County in 2022. As these data indicate, the county’s largest industry sectors that year were Trade, Transportation and Utilities (4,605 jobs), followed by Education and Health Services (2,887 jobs), and Manufacturing (2,722 jobs).

Figure 9 provides a similar ranking for average private sector weekly wages by industry supersector in Washington County in 2022. As these data show, the highest paying industry sectors that year were Financial Activities (\$1,228 per week), Professional and Business Services (\$1,045 per week), and Education and Health Services (\$1,004 per week). To provide a point of reference, the average private sector weekly wage across all industry sectors in Washington County that year was \$858 per week.

<sup>18</sup> Data Source: U.S. Bureau of Labor Statistics.

<sup>19</sup> A “supersector” is the highest level of aggregation in the coding system that the Bureau of Labor Statistics uses to classify industries.



Figure 8: Private Employment by Industry Supersector in Washington County – 2022<sup>20</sup>

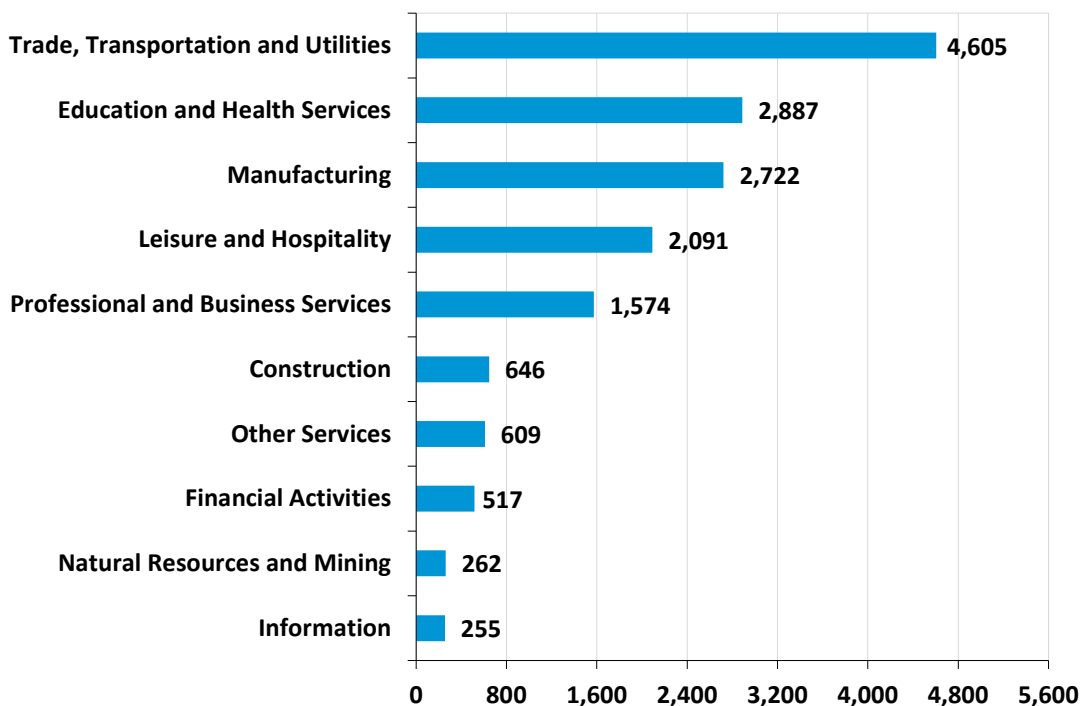
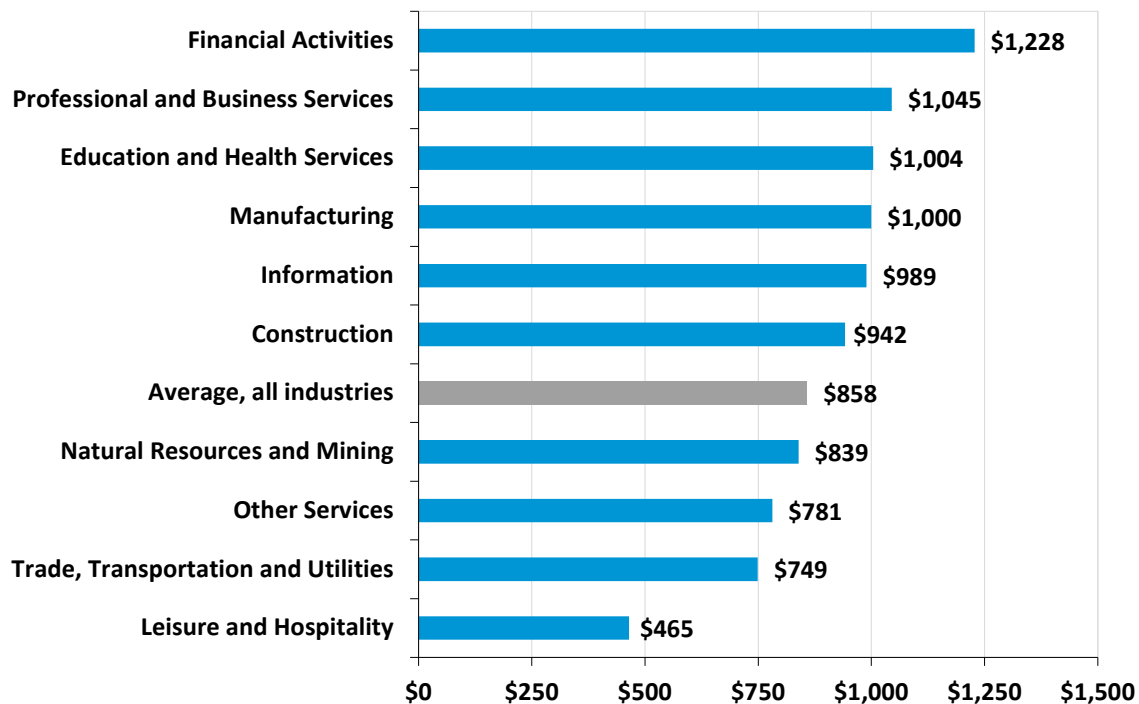


Figure 9: Average Private Weekly Wages by Industry Supersector in Washington County – 2022<sup>21</sup>



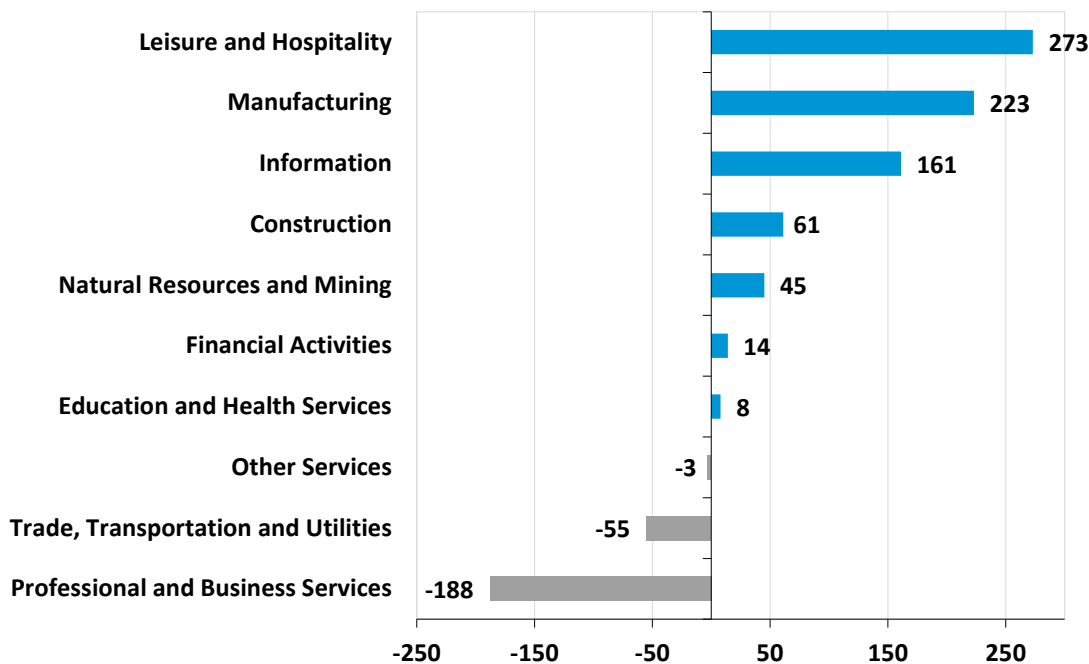
<sup>20</sup> Data Source: U.S. Bureau of Labor Statistics.

<sup>21</sup> Data Source: U.S. Bureau of Labor Statistics.



Figure 10 details the year-over-year change in private sector employment from 2021 to 2022 in Washington County by industry supersector. Over this period, the largest employment gains occurred in the Leisure and Hospitality (up 273 jobs), Manufacturing (up 223 jobs), and Information (up 161 jobs) sectors. The largest employment losses occurred in the Professional and Business Services (down 188 jobs), Trade, Transportation and Utilities (down 55 jobs), and Other Services (down 3 jobs) sectors.

Figure 10: Change in Private Employment by Industry Supersector in Washington County from 2021 to 2022<sup>22</sup>



## Unemployment

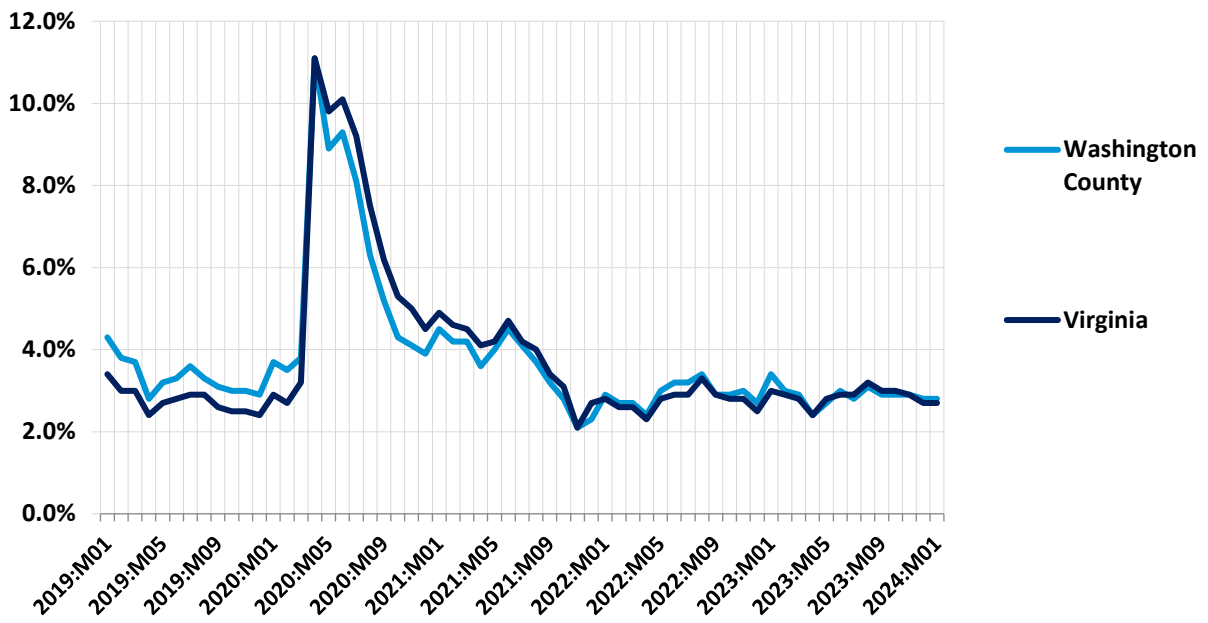
Figure 11 illustrates the trend in Washington County’s unemployment rate over the five-year period from January 2019 through January 2024 and benchmarks those data against the statewide trend for Virginia. As these data show, unemployment rates in Washington County tracked closely with the statewide trend for most of the period. In April 2020, unemployment in the county and state significantly rose as a result of the labor dislocations caused by the COVID-19 pandemic. As of January 2024, unemployment stood at 2.8 percent in Washington County and at 2.7 percent in Virginia.

<sup>22</sup> Data Source: U.S. Bureau of Labor Statistics.





Figure 11: Unemployment Rate – January 2019 to January 2024<sup>23</sup>



<sup>23</sup> Data Source: U.S. Bureau of Labor Statistics.

## Economic and Fiscal Impact

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This section quantifies the economic and fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County. The analysis separately evaluates the one-time pulse of economic activity that would occur during the construction phase of the project, as well as the annual economic activity that the project would generate during its ongoing operational phase.

### Method

To empirically evaluate the likely local economic impact attributable to the proposed Wolf Hills Solar project, the analysis employs a regional economic impact model called IMPLAN.<sup>24</sup> The IMPLAN model is one of the most commonly used economic impact simulation models in the U.S., and in Virginia is used by UVA's Weldon Cooper Center, the Virginia Department of Planning and Budget, the Virginia Employment Commission, and other state agencies and research institutes. Like all economic impact models, the IMPLAN model uses economic multipliers to quantify economic impact.

Economic multipliers measure the ripple effects that an expenditure generates as it makes its way through the economy. For example, as when the Wolf Hills Solar project purchases goods and services – or when contractors hired by the facility use their salaries and wages to make household purchases – thereby generating income for someone else, which is in turn spent, thereby becoming income for yet someone else, and so on, and so on. Through this process, one dollar in expenditures generates multiple dollars of income. The mathematical relationship between the initial expenditure and the total income generated is the economic multiplier.

One of the primary advantages of the IMPLAN model is that it uses regional and national production and trade flow data to construct region-specific and industry-specific economic multipliers, which are then further adjusted to reflect anticipated actual spending patterns within the specific geographic study area that is being evaluated. As a result, the economic impact estimates produced by IMPLAN are not generic. They reflect as precisely as possible the economic realities of the specific industry, and the specific study area, being evaluated.

In the analysis that follows, these impact estimates are divided into three categories. First round direct impact measures the direct economic contribution of the entity being evaluated (e.g., own employment, wages paid, goods and services purchased by the Wolf Hills Solar project). Second round indirect and induced impact measures the economic ripple effects of this direct impact in terms of business to business, and household (employee) to business, transactions. Total impact is simply the sum of the preceding two. These categories of impact are then further defined in terms of employment (the jobs that are created), labor income (the wages and benefits associated with those jobs), and economic output (the total amount of economic activity that is created in the economy).

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<sup>24</sup> IMPLAN is produced by IMPLAN Group, LLC.

## Construction Phase

This portion of the section assesses the economic and fiscal impact that the one-time pulse of activity associated with construction of the proposed Wolf Hills Solar project would have on Washington County.

### Economic Impact Assumptions

The analysis is based on the following assumptions:

- Total capital investment in the Wolf Hills Solar project is estimated to be approximately \$386.9 million.<sup>25</sup>
- Of that total:
  - Architecture, engineering, site preparation, and other construction and development costs are estimated to be approximately \$221.9 million.<sup>26</sup>
  - Capital equipment costs are estimated to be approximately \$165.1 million.<sup>27</sup> It is anticipated that no capital equipment would be purchased from vendors in Washington County.<sup>28</sup>
- Wolf Hills Solar would employ approximately 890 local and non-local full-time equivalent construction workers over a representative 12-month construction period.<sup>29</sup>
- For ease of analysis, all construction expenditures are assumed to take place during a representative 12-month period.

### Economic Impact

Applying these assumptions in the IMPLAN model results in the following estimates of one-time economic and fiscal impact. As shown in Table 1, construction of the proposed Wolf Hills Solar project would directly provide a one-time pulse supporting approximately: 1) 147 job years, 2) \$9.9 million in wages and benefits, and 3) \$45.9 million in economic output to Washington County.

Taking into account the economic ripple effects that direct investment would generate, the total estimated one-time impact on Washington County could support approximately: 1) 262 job years, 2) \$14.7 million in wages and benefits, 3) \$64.3 million in economic output, and 4) \$2.6 million in state and local tax revenue.

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<sup>25</sup> Data Source: Catalyst Energy Partners. Investment estimate is subject to change based on final design and vendor contracts.

<sup>26</sup> Data Source: Catalyst Energy Partners.

<sup>27</sup> Data Source: Catalyst Energy Partners.

<sup>28</sup> Data Source: IMPLAN Group LLC.

<sup>29</sup> Data Source: Catalyst Energy Partners.

Table 1: Estimated One-Time Economic and Fiscal Impact on Washington County from Construction of the Wolf Hills Solar Project<sup>30,31</sup>

Economic Impact	Employment – Job Years	Wages and Benefits	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	147	\$9,908,800	\$45,850,000
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	115	\$4,802,000	\$18,434,400
<b>Total Economic Activity</b>	<b>262</b>	<b>\$14,710,800</b>	<b>\$64,284,400</b>
<b>Fiscal Impact</b>			
<b>State and Local Tax Revenue</b>			<b>\$2,641,800</b>

*\*Totals may not sum due to rounding.*

## Ongoing Operations Phase

This portion of the section assesses the annual economic and fiscal impact that the proposed Wolf Hills Solar project would have on Washington County during its anticipated 35-year operational phase.

## Economic Impact Assumptions

The analysis is based on the following assumptions:

- Wolf Hills Solar would spend approximately \$1.5 million each year for maintenance and repair and other operational expenditures.<sup>32</sup>
- Wolf Hills Solar would make confidential lease payments to local landowners.<sup>33</sup>

## Economic Impact

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact. As shown in Table 2, annual operation of the proposed Wolf Hills Solar project would directly support approximately: 1) 3 jobs, 2) \$0.4 in wages and benefits, and 3) \$1.5 million in economic output to Washington County.

Taking into account the economic ripple effects that direct impact would generate, the total estimated annually supported impact on Washington County would be approximately: 1) 12 jobs, 2) \$0.8 million in wages and benefits, and 3) \$2.9 million in economic output.

<sup>30</sup> Please note that construction sector jobs are not necessarily new jobs, but the investments made can also support a job during the construction of the project. Additionally, it is important to note that it is not possible to know with certainty what proportion of jobs would go to county construction contractors or be filled by county residents.

<sup>31</sup> A construction sector job, also referred to as a job year, is equal to one job over one year. It is used to denote employment on construction projects where the construction schedule is not exactly one year and to account for the fact that actual on-site employment may vary over the period.

<sup>32</sup> Data Source: Catalyst Energy Partners. Expenditure estimate is subject to change based on final design and vendor contracts.

<sup>33</sup> Data Source: Catalyst Energy Partners.



Table 2: Estimated Annual Economic Impact on Washington County from the Ongoing Operation of the Wolf Hills Solar Project<sup>34</sup>

Economic Impact	Employment	Wages and Benefits	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	3	\$416,500	\$1,500,000
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	9	\$387,500	\$1,408,600
<b>Total Economic Activity</b>	<b>12</b>	<b>\$804,000</b>	<b>\$2,908,600</b>

*\*Totals may not sum due to rounding.*

### Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- Wolf Hills Solar would be situated on approximately 1,575 fenced-in acres within an approximate 1,900-acre tract of leased and purchased land.<sup>35</sup>
- Only the fenced-in acreage would be removed from the land use program and reassessed at a solar use assessment value of \$10,000 per acre.<sup>36</sup>
- Tax rates remain constant throughout the analysis.
- Wolf Hills Solar’s total generation capacity would be 262 MW AC.<sup>37</sup>
- Wolf Hills Solar would become operational in 2027.<sup>38</sup>
- Wolf Hills Solar would have an operational life of 35 years.<sup>39</sup>

### Fiscal Impact

This portion of the section quantifies the direct fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County. The analysis considers two sources of revenue. The first source is the additional revenue that Wolf Hills Solar would generate for Washington County over a 35-year period from the increased property assessments associated with reassessing the site as solar use property. The second source is revenue associated with a locally adopted revenue share ordinance and based on the project’s total generation capacity.

#### Reassessment of Property

Table 3 details the increased tax revenue associated with removing the affected acreage from the land use program and reassessing the 1,575-acre fenced-in site as solar use property. The county real estate

<sup>34</sup> Please note that the analysis excludes the impact of vegetative maintenance or agrivoltaics operations.

<sup>35</sup> Data Source: Catalyst Energy Partners.

<sup>36</sup> Data Source: Catalyst Energy Partners. Estimated potential future assessment value based on an informal discussion with the Washington County Commissioner of Revenue’s Office. Actual future assessment value may vary.

<sup>37</sup> Data Source: Catalyst Energy Partners.

<sup>38</sup> Data Source: Catalyst Energy Partners.

<sup>39</sup> Data Source: Catalyst Energy Partners.

tax revenue from the project after reassessment is estimated to be approximately \$94,500 per year, for a cumulative total of approximately \$3.3 million over the project’s anticipated 35-year operational life. Adding one-time rollback taxes of approximately \$0.2 million increases that cumulative total to approximately \$3.5 million. In contrast, the property currently generates approximately \$9,900 per year in real estate tax revenue for the county, for a cumulative total of approximately \$0.3 million over 35 years.<sup>40</sup>

**Table 3: Estimated County Revenue Generated by the Proposed Wolf Hills Solar Project over 35 Years from Real Estate Taxes**

Estimated Increased Appraised Value of Property under Solar Use <sup>41</sup>	\$15,750,000
Washington County Real Estate Tax Rate <sup>42</sup>	0.0060
Annual County Real Estate Tax – Solar Use	\$94,500
<b>Cumulative Revenue over 35 Years</b>	<b>\$3,307,500</b>
<b>One-Time Rollback Taxes<sup>43</sup></b>	<b>\$172,100</b>
<b>Total Cumulative Revenue over 35 Years</b>	<b>\$3,479,600</b>

*\*Totals may not sum due to rounding.*

### Revenue Share Ordinance

The following section describes the additional annual revenue that the proposed Wolf Hills Solar project would generate for Washington County based on a locally adopted energy revenue share ordinance under Virginia Code §58.1-2636. The Virginia Code currently stipulates that a locality may assess an annual revenue share of up to \$1,400 per megawatt (MW) alternating current (AC) generation capacity of a solar facility. However, legislation that was passed in the 2021 General Assembly (SB 1201/HB 2006) and went into effect on July 1, 2021, allows a 10 percent escalator to be applied to the \$1,400 per MW revenue share every five years, beginning in 2026. Section 58.1-3660 further stipulates that capital investment associated with the solar project will be exempt from taxation if the county adopts an energy revenue share ordinance. Washington County’s Planning Board approved a revenue share ordinance in May 2024 and the County’s Board of Supervisors is anticipated to officially approve and adopt it in June 2024.

Table 4 details the revenue generated from a revenue share ordinance including the 10 percent escalator. Based on a total generation capacity of 262 MW AC and an assumed commissioning date of

<sup>40</sup> Derived from Washington County’s GIS Website and property tax cards.

<sup>41</sup> Calculated as 1,575 acres time \$10,000 per acre.

<sup>42</sup> Data Source: Washington County Tax Rate Information website.

<sup>43</sup> Rollback taxes are computed as the difference between the current land use value assessment tax and the tax on the fair market value for the affected acreage for five complete tax years plus the current year, including simple interest. Does not account for changes in assessment values over time.



2027, a revenue share ordinance would generate approximately \$19.5 million over the anticipated 35-year operational life of the project.

**Table 4: Estimated County Revenue Generated from a Revenue Share Ordinance over 35 Years**

Year	MW	Revenue Share per MW with Escalator	Annual County Revenue
1	262	\$1,540	\$403,500
2	262	\$1,540	\$403,500
3	262	\$1,540	\$403,500
4	262	\$1,540	\$403,500
5	262	\$1,694	\$443,800
6	262	\$1,694	\$443,800
7	262	\$1,694	\$443,800
8	262	\$1,694	\$443,800
9	262	\$1,694	\$443,800
10	262	\$1,863	\$488,200
11	262	\$1,863	\$488,200
12	262	\$1,863	\$488,200
13	262	\$1,863	\$488,200
14	262	\$1,863	\$488,200
15	262	\$2,050	\$537,000
16	262	\$2,050	\$537,000
17	262	\$2,050	\$537,000
18	262	\$2,050	\$537,000
19	262	\$2,050	\$537,000
20	262	\$2,255	\$590,700
21	262	\$2,255	\$590,700
22	262	\$2,255	\$590,700
23	262	\$2,255	\$590,700
24	262	\$2,255	\$590,700
25	262	\$2,480	\$649,800
26	262	\$2,480	\$649,800
27	262	\$2,480	\$649,800
28	262	\$2,480	\$649,800
29	262	\$2,480	\$649,800
30	262	\$2,728	\$714,800
31	262	\$2,728	\$714,800
32	262	\$2,728	\$714,800
33	262	\$2,728	\$714,800
34	262	\$2,728	\$714,800
35	262	\$3,001	\$786,300
<b>Cumulative Total</b>			<b>\$19,522,200</b>

### *Total Fiscal Impact*

Table 5 combines the results from the calculations depicted in Tables 3 and 4 to provide an estimate of the cumulative fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County over its 35-year anticipated operational life. As these data indicate, that cumulative total is approximately \$23.0 million.

**Table 5: Estimated Cumulative County Revenue from the Proposed Wolf Hills Solar Project over 35 Years under Scenario 2**

County Real Estate Tax	\$3,479,600
County Revenue from Revenue Share Ordinance	\$19,522,200
<b>TOTAL Cumulative Revenue over 35 Years</b>	<b>\$23,001,800</b>

*\*Totals may not sum due to rounding.*



## Current Agricultural Use

This section provides a benchmark for the previous estimates of the economic and fiscal contribution that the proposed Wolf Hills Solar project would make to Washington County by estimating the economic and fiscal contribution that the site makes to the county in its current agricultural use.

### Economic Impact Assumptions

The analysis is based on the following assumptions:

- The proposed Wolf Hills Solar project would be situated on an approximate 1,575-acre tract of land used for cattle grazing.<sup>44</sup>
- Approximately 420 cattle currently use the land for grazing.<sup>45</sup>
- The proposed site supports the cattle operations of 4 individual owners that employ 4 full-time equivalent workers.<sup>46</sup>

### Economic Impact

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact. As shown in Table 6, in its current use the proposed Wolf Hills Solar project site directly supports approximately: 1) 8 jobs, 2) \$0.1 million in wages and benefits, and 3) \$1.0 million in economic output to Washington County.

Taking into account the economic ripple effects that direct impact generates, on average, the total annually supported impact on Washington County is approximately: 1) 9 jobs, 2) \$0.2 million in wages and benefits, and 3) \$1.2 million in economic output.

**Table 6: Total Estimated Annual Economic Impact of the Wolf Hills Solar Project Site on Washington County – Current Agricultural Use<sup>47</sup>**

Economic Impact	Employment	Wages and Benefits	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	8	\$115,100	\$1,030,300
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	1	\$45,200	\$173,900
<b>Total Economic Activity</b>	<b>9</b>	<b>\$160,300</b>	<b>\$1,204,200</b>

*\*Totals may not sum due to rounding.*

<sup>44</sup> Data Source: Catalyst Energy Partners.

<sup>45</sup> Data Source: Catalyst Energy Partners.

<sup>46</sup> Data Source: Catalyst Energy Partners.

<sup>47</sup> Calculations based data from the U.S. Department of Agriculture and IMPLAN Group, LLC for Virginia and Washington County.

## Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- The current use assessment value of the affected acreage is approximately \$1.7 million.<sup>48</sup>

## Fiscal Impact

Table 7 details the estimated tax revenue that the proposed Wolf Hills Solar site generates for Washington County in its current agricultural use. As the data in Table 7 indicate, the current county real estate tax revenue from the project site is estimated to be approximately \$9,900 per year, for a cumulative total of approximately \$0.3 million over 35 years.

**Table 7: Estimated County Revenue Generated by the Proposed Wolf Hills Solar Project Site over 35 Years from Real Estate Taxes – Current Agricultural Use**

Estimated Assessed Value of Property – Agricultural Use <sup>49</sup>	\$1,658,200
Washington County Current Real Estate Tax Rate	0.0060
Estimated Annual County Real Estate Tax – Agricultural Use	\$9,900
<b>Total Cumulative Revenue over 35 Years</b>	<b>\$348,200</b>

*\*Totals may not sum due to rounding.*

## Agricultural Land Use

The agricultural sector in Washington County includes 1,358 farms operating on 169,761 acres of farmland. These farms generate approximately \$94.5 million in total sales, with livestock, poultry, and related products contributing approximately \$84.9 million (90 percent) and crop sales contributing approximately \$9.6 million (10 percent). Statewide, Washington County is ranked 6th in livestock sales and 55th in crop sales.<sup>50</sup>

Table 8 provides insights into Washington County's agricultural landscape, highlighting several farmland classifications that contribute to the local economy. Prime farmland encompasses 71 acres within the project's limits, representing 0.6% of the county's total 12,665 acres of prime farmland. Farmland of statewide importance covers a larger area, with 1,659 acres within the project acreage, making up approximately 1.3% of the county's total 125,832-acre presence. Non-prime farmland accounts for 1,190 acres within the project area, representing 0.5% of the county's 222,417 total acres.<sup>51</sup>

<sup>48</sup> Data Source: Derived from Washington County's GIS Website and property tax cards. Excludes value of existing structures as they will not be affected.

<sup>49</sup> Data Source: Derived from Washington County's GIS Website and property tax cards. Excludes value of existing structures as they will not be affected.

<sup>50</sup> Data Source: 2022 U.S. Census of Agriculture.

<sup>51</sup> Data Source: Prime Farmland Soil Analysis provided by Timmons Group.



Table 8: Land Use within Washington County<sup>52</sup>

Farmland Class	Acreage within Project Limits	Acreage within all of Washington County	Percentage within Project Site
Prime Farmland	71	12,665	0.6%
Farmland of Statewide Importance	1,659	125,832	1.3%
Prime Farmland if Drained	0	636	0.0%
Not Prime Farmland	1,190	222,417	0.5%

*The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.*

<sup>52</sup> Data Source: Prime Farmland Soil Analysis provided by Timmons Group. Please note that the analysis was prepared before the current site plan.