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# SPOTSYLVANIA SOLAR ENERGY CENTER

ECONOMIC AND FISCAL CONTRIBUTION  
TO SPOTSYLVANIA COUNTY



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## About Mangum Economics, LLC

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Identify the intended and, more importantly, unintended consequences of proposed legislation and other policy initiatives.

### ECONOMIC IMPACT ASSESSMENTS AND RETURN ON INVESTMENT ANALYSES

Measure the economic contribution that business, education, or other enterprises make to their localities.

### WORKFORCE INFORMATION

Project the demand for, and supply of, qualified workers.

### CLUSTER ANALYSIS

Use occupation and industry clusters to illuminate regional workforce and industry strengths and identify connections between the two.

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Assess the economic, demographic, and other factors likely to affect your enterprise in the future.

### The Project Team

A. Fletcher Mangum, Ph.D.  
*Founder and CEO*



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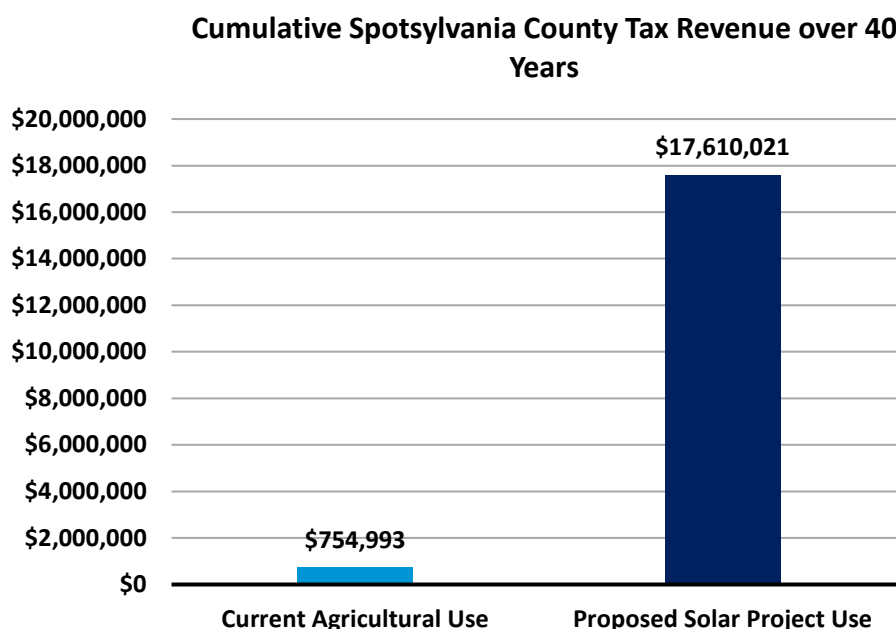
## Executive Summary

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This report assesses the economic and fiscal contribution that the proposed Spotsylvania Solar Energy Center (SSEC) would make to Spotsylvania County. The primary findings from that assessment are as follows:

- 1) The SSEC is a 650-Megawatt (MW) solar project located in western Spotsylvania County, Virginia. The Project Site encompasses approximately 6,500 acres, of which approximately 3,500 acres will be developed into the solar project, with the remaining 3,000 acres preserved as undeveloped, vacant land. The project site currently consists of recently timbered land and is bordered by other forested lands and scattered single-family residences.
- 2) The proposed SSEC project would make a significant economic contribution to Spotsylvania County:
  - The proposed SSEC project would provide an estimated one-time pulse of economic activity during its construction phase of approximately:
    - 843 full-time-equivalent jobs.
    - \$45.8 million in associated labor income.
    - \$110.0 million in economic output.
  - The proposed SSEC project would provide an estimated annual economic impact during its ongoing operational phase of approximately:
    - 34 full-time-equivalent jobs.
    - \$2.5 million in associated labor income.
    - \$4.7 million in economic output.
  - In comparison, our analysis indicates that in its current agricultural use the property that would be occupied by the SSEC provides a potential estimated annual economic impact of approximately:
    - 228 full-time-equivalent jobs.
    - \$1.2 million in associated labor income.
    - \$2.8 million in economic output.
- 3) The proposed SSEC project would also make a significant fiscal contribution to Spotsylvania County. We estimate that the proposed project would generate approximately:
  - \$3.5 million in state and local tax revenue from the one-time pulse of economic activity associated with the project's construction.
  - \$1.4 million in county revenue in the facility's first year of operation, with that figure projected to gradually decline to \$180,557 in the facility's 40<sup>th</sup> year of operation as the value of the proposed project-related capital investments is depreciated, for a cumulative impact of \$17.6 million.

- 4) Even though by itself the proposed SSEC is unlikely to have any impact on Spotsylvania County's Composite Index or locally funded school budget, if one controls for the hypothetical upper limit of that impact the proposed project would still generate approximately:
  - \$1.1 million in county revenue in the facility's first year of operation, with that figure projected to gradually decline to \$149,582 in the facility's 40<sup>th</sup> year of operation as the value of the proposed projected-related capital investments is depreciated, for a cumulative impact of \$12.5 million.
- 5) The proposed SSEC will have a significantly greater fiscal impact on Spotsylvania County than the property generates in its current agricultural use:
  - The proposed SSEC will generate approximately \$17.6 million in cumulative county revenue over the 40 year expected life of the solar project, as compared to approximately \$754,993 in cumulative county revenue in the property's current agricultural use – a difference of almost \$16.9 million.



- 6) The SSEC would be entirely consistent with Virginia's stated energy policy objectives as presented in Governor McAuliffe's 2014 Virginia Energy Plan. The very first goal of which is to "accelerate the development of renewable energy sources in the Commonwealth to ensure a diverse fuel mix," because doing so "will lead to economic prosperity through increased jobs and environmental health through lower harmful emissions."

7) The SSEC could aid in attracting high-tech industries to Spotsylvania County:

- Where in 2015 wind and solar energy did not materially contribute to electricity production in Virginia, today Dominion Energy, Virginia's largest electricity producer, has more than 744-megawatts of in-state solar generation capacity that is either operational or under development, and 78 percent of that capacity is directly attributable to partnerships with leading data center companies.
- One such partnership is Amazon Solar Farm U.S. East, an 80-megawatt solar project located on Virginia's Eastern Shore in Accomack County, Virginia. Construction of that project was made possible as a result of a long-term power purchase agreement with Amazon Web Services, an affiliate of Amazon's cloud computing business.
- As this example illustrates, renewable energy is becoming an important asset for localities in promoting technology-driven economic development. And more importantly for Spotsylvania County, data centers are becoming a key component of regional economic development. In nearby Prince William County, data centers accounted for \$1.2 billion in investment in 2016 alone.<sup>1</sup> Moreover, since 2012 data centers have accounted for 92 percent of all industry investment in Prince William County.

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

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<sup>1</sup> Data Source: Prince William County, Department of Economic Development.

## Introduction

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This report assesses the economic and fiscal contribution that the proposed Spotsylvania Solar Energy Center (SSEC) would make to Spotsylvania County. This report was commissioned by Sustainable Power Group LLC (sPower) and produced by Mangum Economics.

## The Project

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The proposed SSEC project is a 650-Megawatt (MW) solar project located in western Spotsylvania County, Virginia. The project site encompasses approximately 6,500 acres, of which approximately 3,500 acres will be developed into the solar project, with the remaining 3,000 acres preserved as undeveloped, vacant land. The project site currently consists of recently timbered land.

## Electricity Production in Virginia

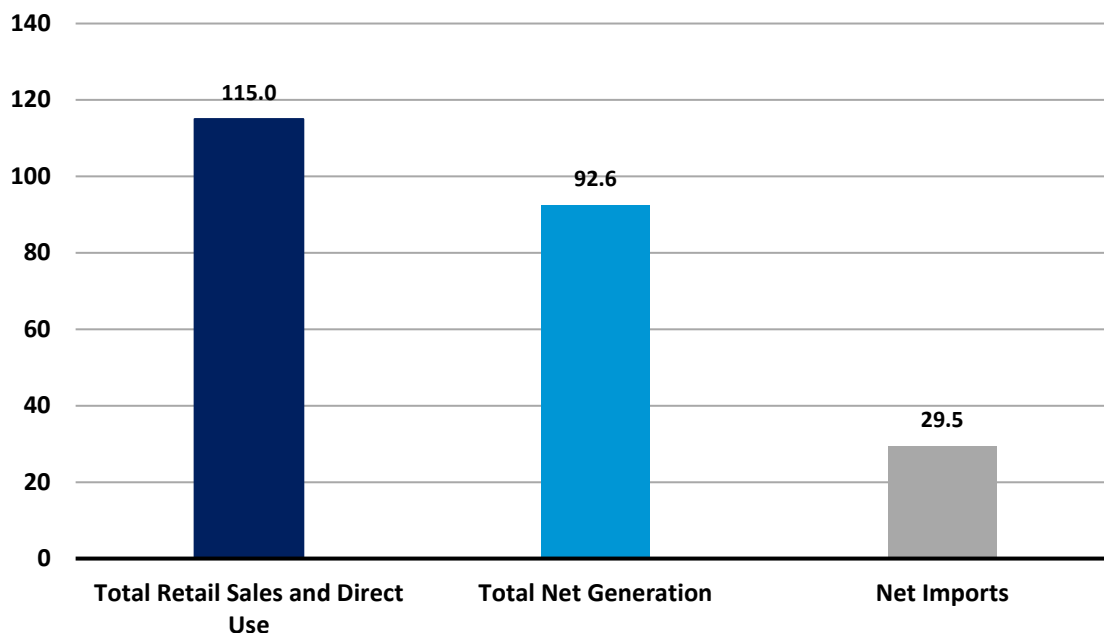
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In this section, we provide a backdrop for the proposed SSEC project by profiling Virginia's electricity production sector and the role that solar energy could play in that sector.

### Overall Market

As shown in Figure 1, in 2016 electricity sales and direct use in Virginia totaled 115.0 million megawatt hours, ranking the state 10<sup>th</sup> among the fifty states in terms of electricity consumption. However, only 81 percent of that demand was met by in-state utilities, independent producers, and other sources. As a result, Virginia had to import 19 percent of the 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 millions of megawatt-hours)<sup>2</sup>



## Sources of Production

Between 2006 and 2016, the total amount of electricity produced by the electric industry in Virginia increased from 73.1 to 92.6 million megawatt hours, while retail and direct consumption of electricity increased from 109.3 to 115.0 million megawatt hours. Figure 2 provides a comparison of the energy sources that were used to produce electricity in Virginia in 2006 and 2016. As these data show, the share of electricity produced using high-emissions energy sources declined over the period. Where coal was the state's largest source of electricity in 2006, accounting for 47 percent of production, by 2016 it had fallen to third place, and accounted for only 18 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 only 10 percent of Virginia's electricity production in 2006, by 2016 that proportion had almost quadrupled to 44 percent, making natural gas the state's largest source of electricity. The one exception to this trend is wind and solar power, which accounted for zero percent of Virginia's electricity production in 2006 and only two-one-hundredths of a percent in 2016.

<sup>2</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."



Figure 2: Electricity Generation in Virginia by Energy Source<sup>3</sup>

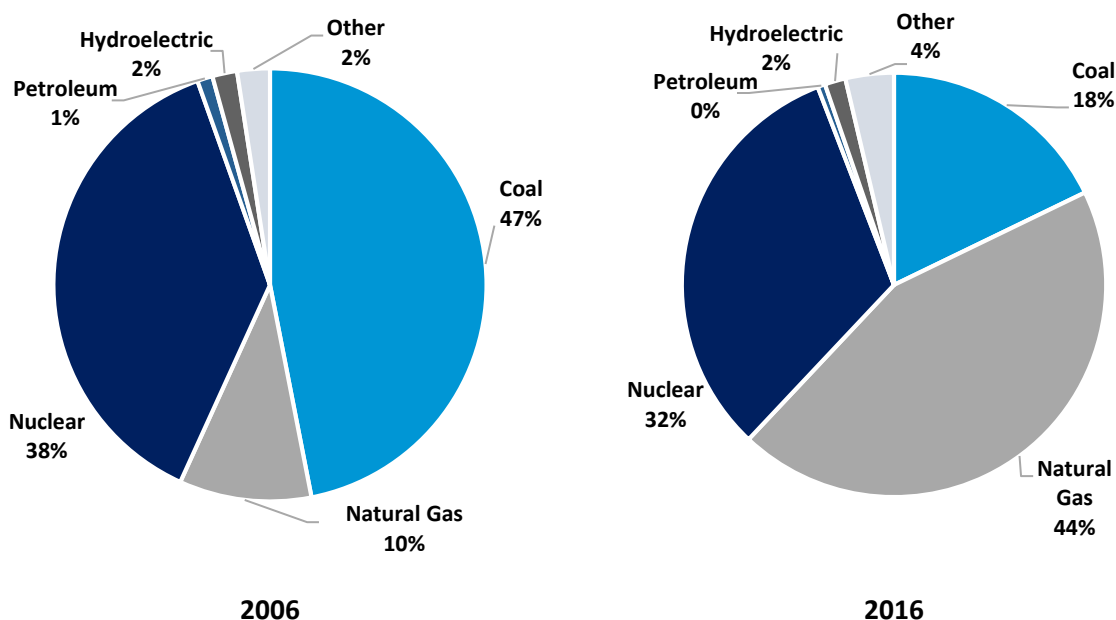
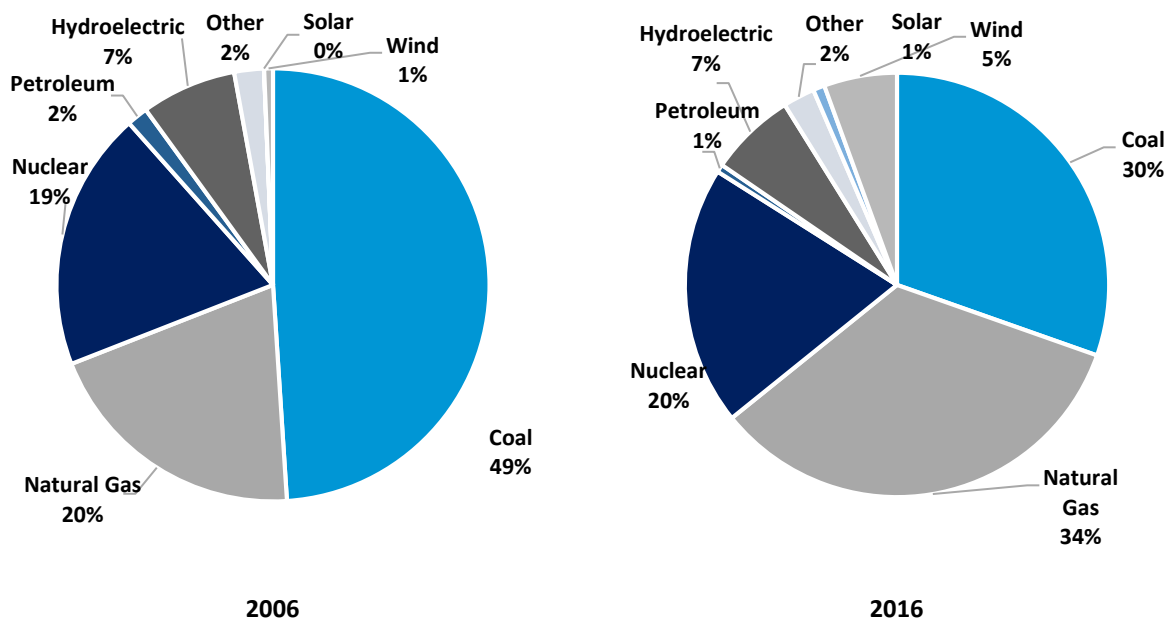


Figure 3 provides similar data for the U.S. as a whole. A quick comparison of Figures 2 and 3 shows similarities, even though the degree of reliance on specific energy sources for electricity production is quite different. Nationally, as in Virginia, the most pronounced trend between 2006 and 2016 was that cleaner-burning low-emissions energy sources replaced high-emissions sources over the period. Where coal accounted for 49 percent of all electricity production nationwide in 2006, by 2016 that proportion had fallen to 30 percent. While at the other end of the spectrum, where natural gas accounted for 20 percent of electricity production nationwide in 2006, by 2016 that figure had grown to 34 percent.

One notable difference between the national trends represented in Figure 3 and the Virginia trends represented in Figure 2, however, is in the wind and solar categories. Where nationally the total contribution of these two energy sources to electricity production increased from 1 percent in 2006 to 6 percent in 2016, in Virginia wind and solar energy did not materially contribute to electricity production in 2006 or 2016.

<sup>3</sup> Data Source: U.S. Energy Information Administration.

Figure 3: Electricity Generation in the U.S. by Energy Source<sup>4</sup>



## Impact on the Environment

In discussing the impact of these trends on the environment, it is important to realize that electricity production is the U.S.'s largest source of greenhouse gas emissions. Electricity production accounted for 40 percent of all carbon dioxide emissions from fossil fuel consumption in the U.S. in 2006, and 35 percent ten years later in 2016.<sup>5</sup> However, that small change in percentage share masks some very significant changes in absolute emissions. Moreover, those changes in emissions levels were largely attributable to the shifts described above, which is to say that as the industry has transitioned to cleaner-burning energy sources, its greenhouse gas emissions have fallen.

Figure 4 depicts this change for both Virginia and the U.S. nationally. As these data indicate, between 2006 and 2016, as the share of electricity produced in Virginia by coal fell from 47 to 18 percent, carbon dioxide emissions from electricity production fell from 42.5 to 36.6 million metric tons. Similarly, at the national level as the share of electricity produced by coal and petroleum fell from 49 to 30 percent, carbon dioxide emissions from electricity production fell from 2,488.9 to 1,928.4 million metric tons.

To further promote these shifts, the very first recommendation in Governor McAuliffe's 2014 Virginia Energy Plan proposed to "accelerate the development of renewable energy sources in the Commonwealth to ensure a diverse fuel mix," because doing so "will lead to economic prosperity through increased jobs and environmental health through lower harmful emissions."<sup>6</sup>

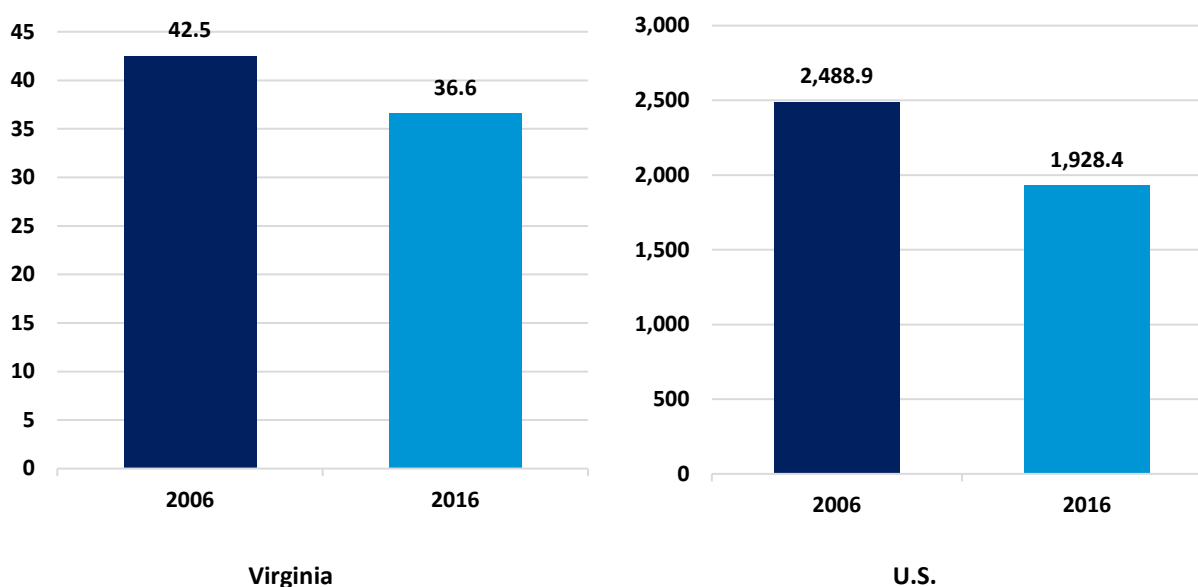
<sup>4</sup> Data Source: U.S. Energy Information Administration.

<sup>5</sup> Data Source: U.S. Energy Information Administration.

<sup>6</sup> Virginia Energy Plan, Virginia Department of Mines, Minerals, and Energy, October 1, 2014.



Figure 4: Carbon Dioxide Emissions from Electricity Production (millions of metric tons)<sup>7</sup>



## Local Economic Profile

In this section, we provide context for the economic and fiscal impact assessments to follow by profiling the local economy of Spotsylvania County.

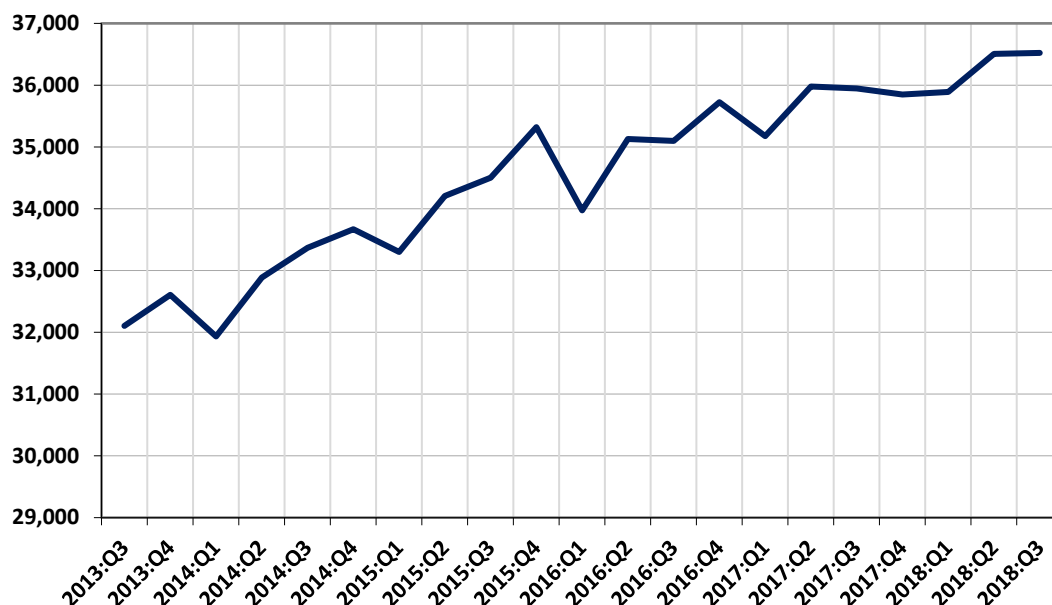
### Total Employment

Figure 5 depicts the trend in total employment in Spotsylvania County from the 3<sup>rd</sup> quarter of 2013 to the 3<sup>rd</sup> quarter of 2018. As these data show, employment growth in the county trended rapidly upward for the first half of the period but has since decelerated. As of the 3<sup>rd</sup> quarter of 2018, county employment stood at 36,522 jobs. This represents a 4,419 job, or 13.8 percent, increase in employment over the period as a whole. To put this number in perspective, over this same period total statewide employment in Virginia increased by 7.1 percent.<sup>8</sup>

<sup>7</sup> Data Source: U.S. Energy Information Administration.

<sup>8</sup> Data Source: Virginia Employment Commission.

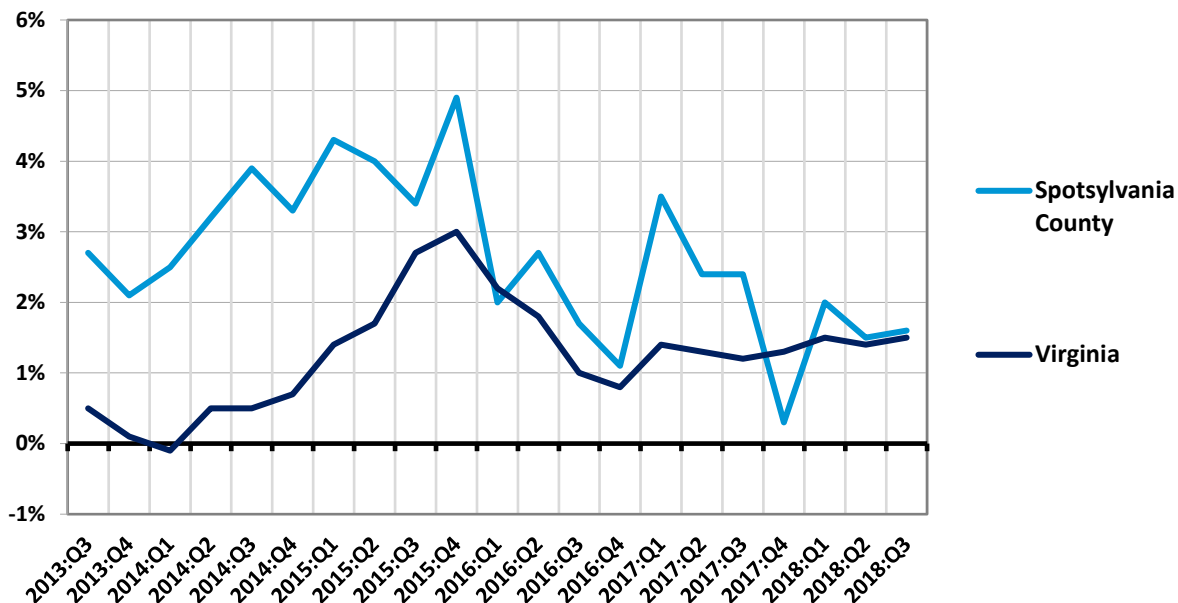
Figure 5: Total Employment in Spotsylvania County – 3<sup>rd</sup> Quarter 2013 to 3<sup>rd</sup> Quarter 2018<sup>9</sup>



To control for seasonality and provide a point of reference, Figure 6 compares the year-over-year change in total employment in Spotsylvania County to that of the state of Virginia as a whole over the same five-year period. Any point above the zero line in this graph indicates growth in year-over-year employment, while any point below the zero line indicates a decline in year-over-year employment. As these data indicate, year-over-year employment changes in Spotsylvania County out-performed the statewide average throughout most of the period. However, that margin closed from 2016 on. As of the 3<sup>rd</sup> quarter of 2018, year-over-year employment growth was 1.6 percent in Spotsylvania County as compared to 1.5 percent statewide in Virginia.

<sup>9</sup> Data Source: Virginia Employment Commission.

Figure 6: Year-Over-Year Change in Total Employment – 3<sup>rd</sup> Quarter 2013 to 3<sup>rd</sup> Quarter 2018<sup>10</sup>



## Employment and Wages by Major Industry Sector

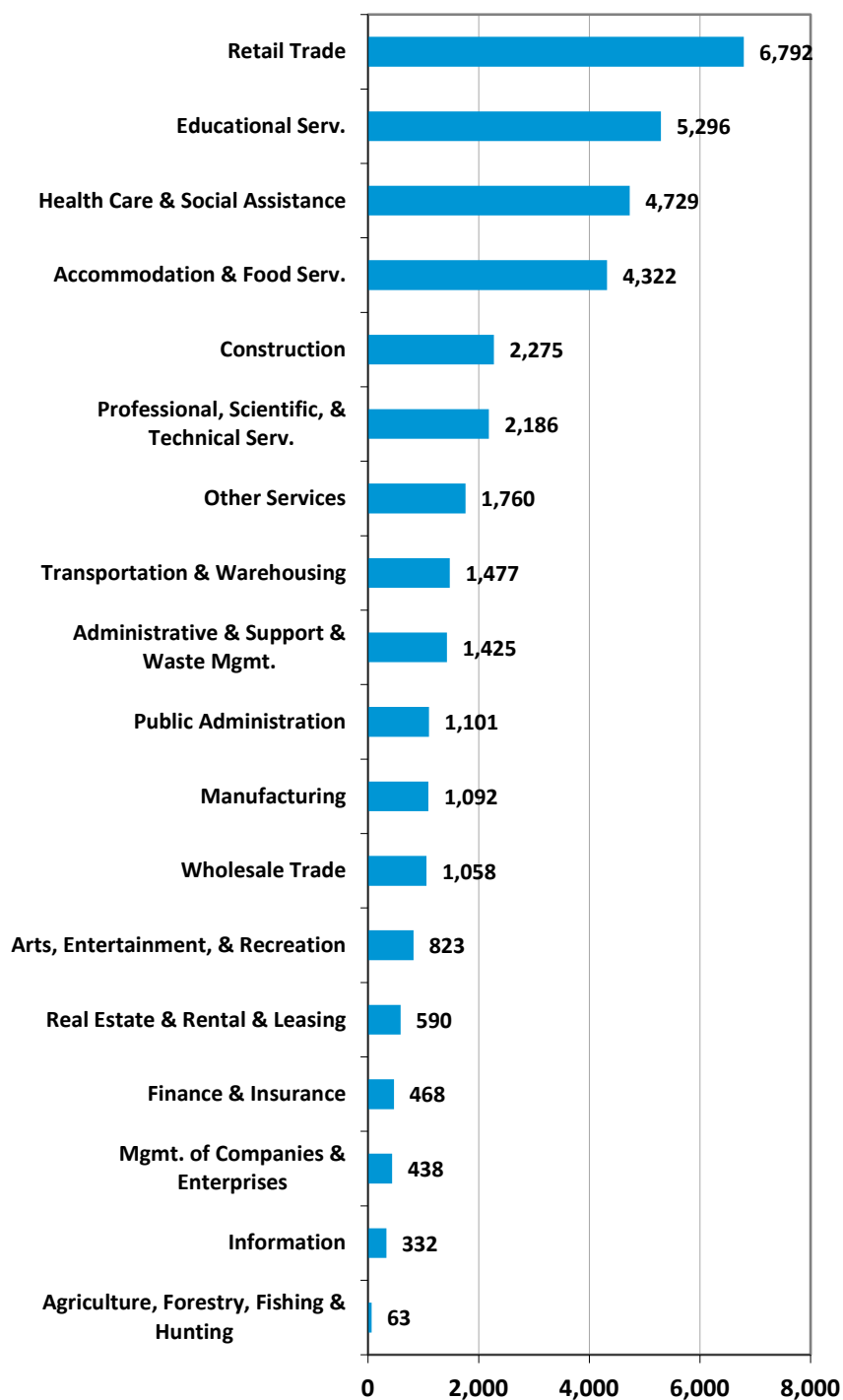
To provide a better understanding of the underlying factors motivating the total employment trends depicted in Figures 5 and 6, Figures 7 through 9 provide data on employment and wages by major industry sector in Spotsylvania County.

Figure 7 provides an indication of the distribution of employment across major industry sectors in Spotsylvania County's economy in the 3<sup>rd</sup> quarter of 2018 by ranking each industry sector by total employment. As these data indicate, the county's largest industry sector that quarter was Retail Trade (6,792 jobs), followed by Educational Services 5,296 jobs), Health Care and Social Assistance (4,729 jobs), Accommodation and Food Services (4,322 jobs), and Construction (2,275 jobs).

Figure 8 provides a similar ranking for average weekly wages by major industry sector in Spotsylvania County in the 3<sup>rd</sup> quarter of 2018. As these data show, the highest paying industry sectors in the county that quarter were Professional Scientific, and Technical Services (\$1,493 per week), Management of Companies and Enterprises (\$1,235 per week), Public Administration (\$1,115 per week), Finance and Insurance (\$1,108 per week), and Wholesale Trade (\$1,082 per week). By way of reference, the average weekly wage across all industry sectors in Spotsylvania County that quarter was \$766 per week.

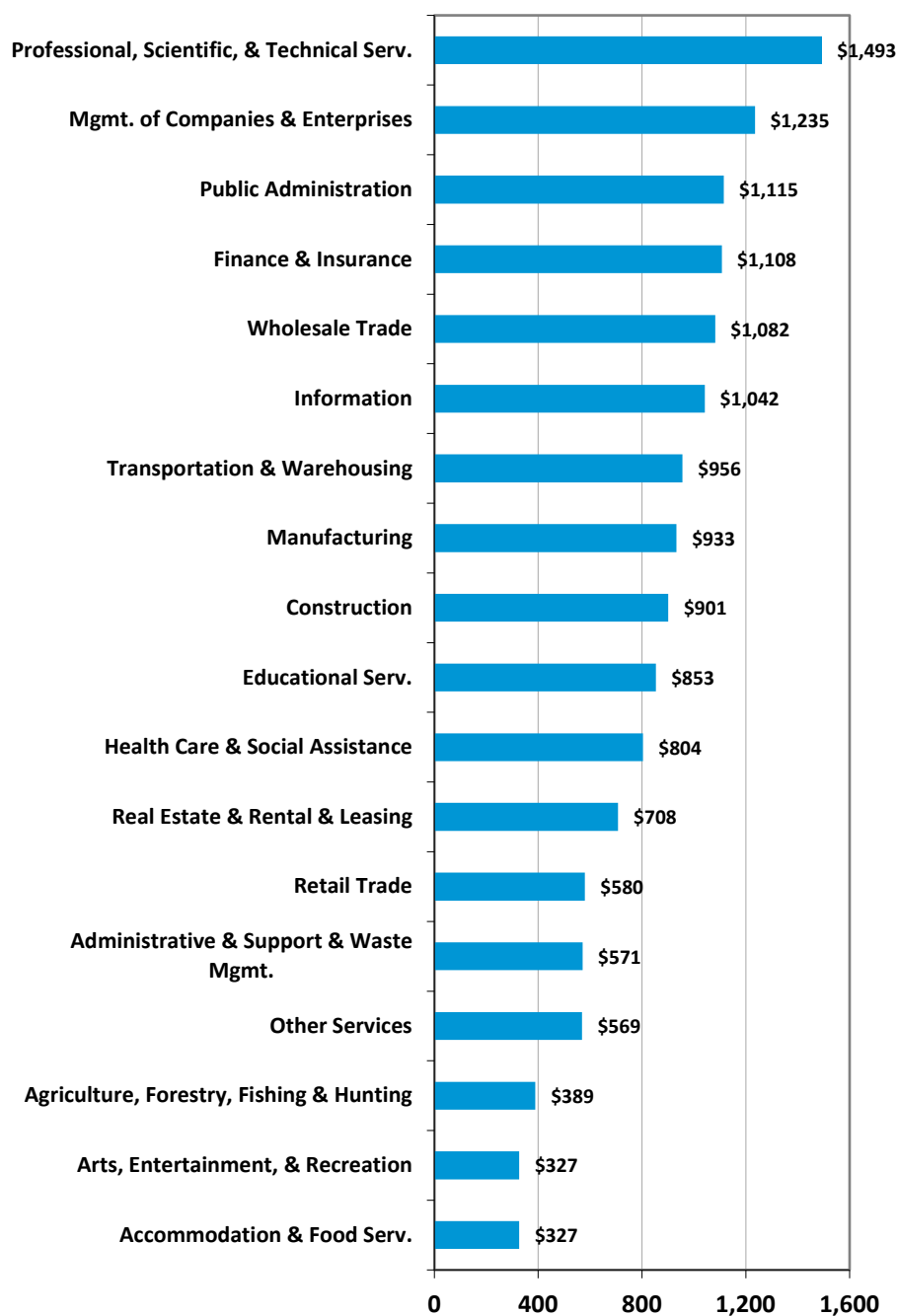
<sup>10</sup> Data Source: Virginia Employment Commission.

Figure 7: Employment by Major Industry Sector in Spotsylvania County – 3<sup>rd</sup> Quarter 2018<sup>11</sup>



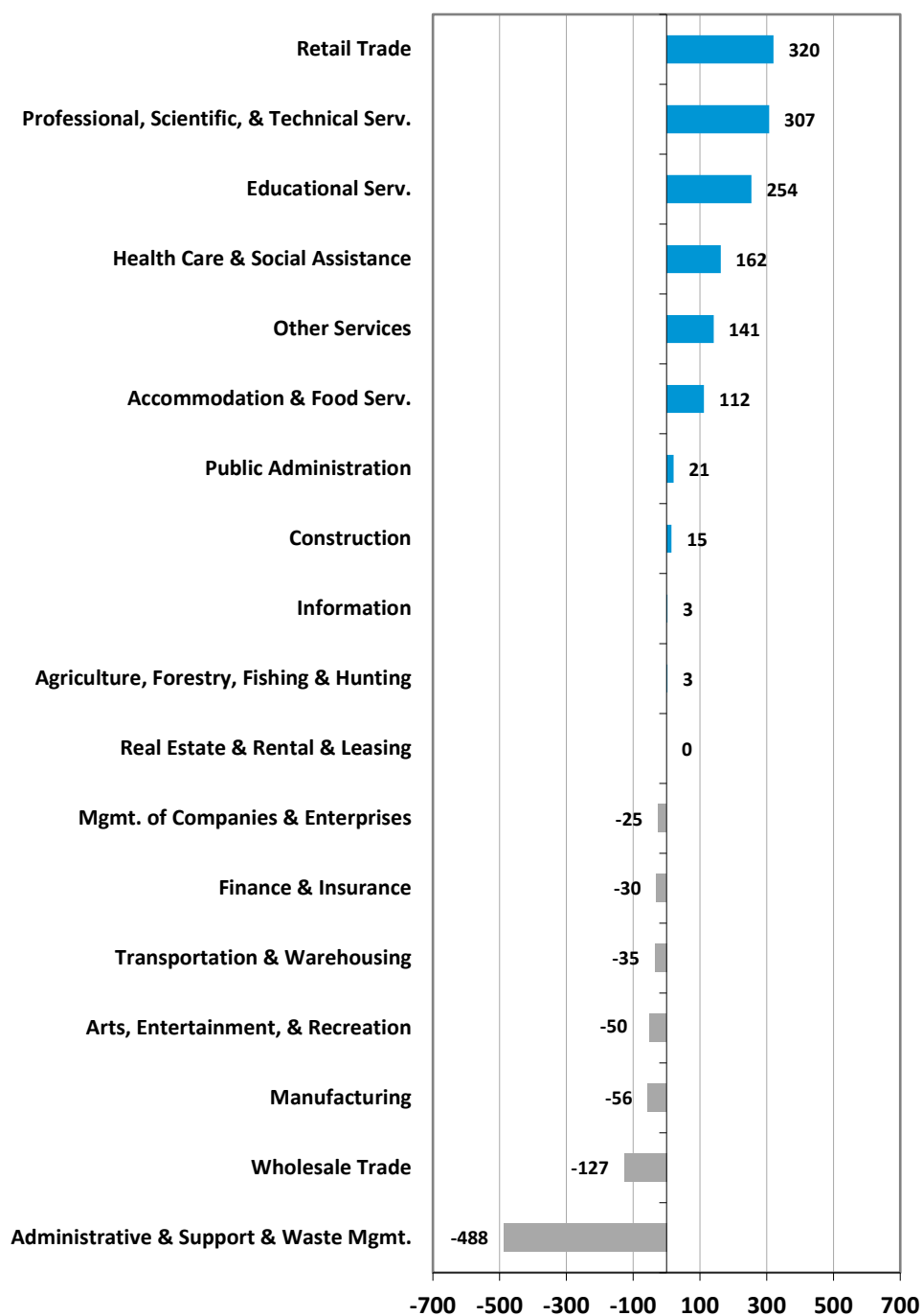
<sup>11</sup> Data Source: Virginia Employment Commission.

Figure 8: Average Weekly Wages by Major Industry Sector in Spotsylvania County – 3<sup>rd</sup> Quarter 2018<sup>12</sup>



<sup>12</sup> Data Source: Virginia Employment Commission.

Figure 9: Change Employment by Major Industry Sector in Spotsylvania County – 3<sup>rd</sup> Quarter 2017 to 3<sup>rd</sup> Quarter 2018<sup>13</sup>



<sup>13</sup> Data Source: Virginia Employment Commission.



Lastly, Figure 9 details the year-over-year change in employment between the 3<sup>rd</sup> quarter of 2017 and the 3<sup>rd</sup> quarter of 2018 by major industry sector in Spotsylvania County. Over this period, the largest employment gains occurred in the Retail Trade (up 320 jobs), Professional, Scientific, and Technical Services (up 307 jobs), and Educational Services (up 254 jobs) sectors. While at the other end of the spectrum, the largest employment losses occurred in the Administrative Support and Waste Management (down 488 jobs), Wholesale Trade (down 127 jobs), and Manufacturing (down 56 jobs) sectors.

## Unemployment

Figure 10 illustrates the trend in Spotsylvania County's unemployment rate over the five-year period from December 2013 through December 2018 and benchmarks those data against the statewide trend for Virginia. As these data show, unemployment rates in Spotsylvania County generally tracked very closely with the statewide average throughout this period. As of December 2018, unemployment stood at 2.6 percent in both Spotsylvania County and in Virginia as a whole.

Figure 10: Unemployment Rate – December 2013 to December 2018<sup>14</sup>



<sup>14</sup> Data Source: Virginia Employment Commission.

## Economic and Fiscal Impact

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In this section, we quantify the economic and fiscal contribution that the proposed SSEC project would make to Spotsylvania County. Our 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 operations phase.

### Method

To empirically evaluate the likely local economic impact attributable to the proposed SSEC project, we employ a regional economic impact model called IMPLAN.<sup>15</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 SSEC purchases goods and services – or when project employees 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 SSEC). 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>15</sup> IMPLAN v.3 is produced by Minnesota IMPLAN Group, Inc.

## Construction Phase

In this portion of the section, we assess the economic and fiscal impact that the one-time pulse of activity associated with construction of the proposed SSEC project would have on Spotsylvania County.

### Assumptions

In conducting our analysis, we employ the following assumptions:

- For ease of analysis, all construction expenditures are assumed to take place in a single year.
- Total architecture, engineering, and construction costs are estimated to be \$215,475,000 for the SSEC.<sup>16</sup>
- It is anticipated that approximately 34 percent of architecture, engineering, and construction expenditures would be spent with vendors in Spotsylvania County.<sup>17</sup>
- Capital equipment costs are estimated to be \$337,025,000 for the SSEC.<sup>18</sup>
- It is anticipated that no capital equipment will be purchased from vendors in Spotsylvania County.<sup>19</sup>

### Results

By feeding these assumptions into the IMPLAN model, we obtain the following estimates of one-time economic and fiscal impact. As shown in Table 1, construction of the proposed SSEC project would directly provide a one-time pulse of approximately: 1) 523 full-time-equivalent jobs, 2) \$31.9 million in labor income, and 3) \$70.8 million in economic output to Spotsylvania County.

Taking into account the economic ripple effects that direct investment would generate, we estimate that the total one-time impact on Spotsylvania County would be: 1) 843 full-time-equivalent jobs, 2) \$45.8 million in labor income, 3) \$110.0 million in economic output, and 4) \$3.5 million in state and local tax revenue.

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<sup>16</sup> Data Source: sPower.

<sup>17</sup> Data Source: sPower. It is not possible to know with precision the proportion of services that will be purchased from Spotsylvania County contractors and subcontractors.

<sup>18</sup> Data Source: sPower.

<sup>19</sup> Data Source: sPower.

Table 1: Estimated One-Time Economic and Fiscal Impact on Spotsylvania County from Construction of the SSEC (2018 Dollars)

Economic Impact	Employment	Labor Income	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	523	\$31,858,693	\$70,778,754
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	320	\$13,969,627	\$39,186,689
<b>Total Economic Activity</b>	<b>843</b>	<b>\$45,828,320</b>	<b>\$109,965,443</b>
<b>Fiscal Impact</b>			
<b>State and Local Tax Revenue</b>			<b>\$3,460,221</b>

## Ongoing Operations Phase

In this portion of the section, we assess the annual economic and fiscal impact that the proposed SSEC project would have on Spotsylvania County during its anticipated 40-year operational phase.

### Assumptions

In conducting our analysis, we employ the following assumptions:

- The SSEC would employ approximately 20 people and pay wages of \$1,881,136 each year.<sup>20</sup>
- The SSEC would spend approximately \$1,061,000 each year on the purchase of various goods and services.<sup>21</sup>
- The SSEC would involve a capital investment of \$552,500,000 in equipment and capital improvements to the existing property.<sup>22</sup>
- The SSEC would generate \$579,121 in roll back real property taxes for Spotsylvania County and \$101,121 in annual real estate taxes.<sup>23</sup>

## Results – Economic Impact

By feeding these assumptions into the IMPLAN model, we obtain the following estimates of annual economic impact. As shown in Table 2, annual operation of the proposed SSEC project would directly provide approximately: 1) 20 full-time-equivalent jobs, 2) \$1.9 million in labor income, and 3) \$2.9

<sup>20</sup> Data Source: sPower.

<sup>21</sup> Data Source: sPower.

<sup>22</sup> Data Source: sPower.

<sup>23</sup> Data Source: sPower and Spotsylvania Commissioner of the Revenue. Changing the use of the property from agricultural to industrial increases the assessed value of the property for purposes of real estate taxes. In such instances, Spotsylvania County requires the owner to pay “roll back taxes,” or the difference in the current and previous real estate taxes on the property going back for a period of five years.

million in economic output to Spotsylvania County. Taking into account the economic ripple effects that direct impact would generate, we estimate that the total annual impact on Spotsylvania County would be: 1) 34 full-time-equivalent jobs, 2) \$2.5 million in labor income, and 3) \$4.7 million in economic output.

**Table 2: Estimated Annual Economic Impact on Spotsylvania County from the Ongoing Operation of the SSEC (2018 Dollars)**

Economic Impact	Employment	Labor Income	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	20	\$1,881,136	\$2,942,136
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	14	\$569,370	\$1,774,883
<b>Total Economic Activity</b>	<b>34</b>	<b>\$2,450,506</b>	<b>\$4,717,019</b>

## Results – Fiscal Impact

In this portion of the section, we quantify the fiscal contribution that the proposed SSEC project would make to Spotsylvania County.

### County Revenue

Table 3 details the additional annual revenue that the proposed project would generate for Spotsylvania County over a 40-year period. This calculation is based on: 1) roll back taxes, 2) increased real estate taxes, and 2) the increased value of the property from proposed capital improvements, times depreciation (pursuant to State Corporation Commission guidelines), times the 80 percent local real property tax exemption (pursuant to Virginia Code § 58.1-3660), times Spotsylvania County's real property tax rate of \$0.833 per \$100 of assessed value (pursuant to Virginia Code § 58.1-2606 and the county's published tax rate for real property for 2018), with the property assessed at 86.3 percent in accordance with the State Corporation Commission's guideline for tax assessment of public utilities in Spotsylvania County.

As the data in Table 3 indicate, we estimate county revenue from the project to be approximately \$1,395,167 in the project's first year of operation, with that figure projected to gradually decline to approximately \$180,557 in the project's 40<sup>th</sup> year of operation, as the value of the proposed capital investments is depreciated, for a total cumulative direct fiscal impact of approximately \$17.6 million.

**Table 3: Estimated County Revenue Generated by the Proposed SSEC Project over 40-Years (2018 Dollars)**

Year	Roll Back Taxes <sup>24</sup>	Annual County Tax Revenue from Real Estate <sup>25</sup>	Capital Investment <sup>26</sup>	Depreciation <sup>27</sup>	Depreciated Value of Capital Investment	Taxable Capital Investment (less 80% exemption) <sup>28</sup>	Additional Annual County Tax Revenue Solar Investment <sup>29</sup>	TOTAL Additional Annual County Tax Revenue
1	\$579,121	\$101,121	\$552,500,000	90%	\$497,250,000	\$85,825,350	\$714,925	\$1,395,167
2		\$101,121	\$552,500,000	90%	\$497,250,000	\$85,825,350	\$714,925	\$816,046
3		\$101,121	\$552,500,000	90%	\$497,250,000	\$85,825,350	\$714,925	\$816,046
4		\$101,121	\$552,500,000	90%	\$497,250,000	\$85,825,350	\$714,925	\$816,046
5		\$101,121	\$552,500,000	90%	\$495,758,250	\$85,567,874	\$712,780	\$813,901
6		\$101,121	\$552,500,000	87%	\$482,277,250	\$83,241,053	\$693,398	\$794,519
7		\$101,121	\$552,500,000	85%	\$467,967,500	\$80,771,191	\$672,824	\$773,945
8		\$101,121	\$552,500,000	82%	\$452,829,000	\$78,158,285	\$651,059	\$752,180
9		\$101,121	\$552,500,000	79%	\$436,806,500	\$75,392,802	\$628,022	\$729,143
10		\$101,121	\$552,500,000	76%	\$419,789,500	\$72,455,668	\$603,556	\$704,677
11		\$101,121	\$552,500,000	73%	\$401,722,750	\$69,337,347	\$577,580	\$678,701
12		\$101,121	\$552,500,000	69%	\$382,606,250	\$66,037,839	\$550,095	\$651,216
13		\$101,121	\$552,500,000	66%	\$362,329,500	\$62,538,072	\$520,942	\$622,063
14		\$101,121	\$552,500,000	62%	\$340,892,500	\$58,838,046	\$490,121	\$591,242

<sup>24</sup> Data Source: sPower and Spotsylvania Commissioner of the Revenue.

<sup>25</sup> Data Source: sPower and Spotsylvania Commissioner of the Revenue.

<sup>26</sup> Data Source: sPower.

<sup>27</sup> Data Source: State Corporation Commission guidelines.

<sup>28</sup> Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 20MW are subject to an 80 percent exemption from local property taxes, and using the State Corporation Commission's 2017 utility assessment ratio for Spotsylvania County of 0.863.

<sup>29</sup> Calculated pursuant to Virginia Code § 58.1-2606 which stipulates that capital equipment owned by utilities is taxed as real property and the local tax rate on that capital equipment would be capped at Spotsylvania County's real property tax rate of \$0.833 per \$100 of assessed value.

**Table 3: Estimated County Revenue Generated by the Proposed SSEC Project over 40-Years (2018 Dollars)**

Year	Roll Back Taxes <sup>24</sup>	Annual County Tax Revenue from Real Estate <sup>25</sup>	Capital Investment <sup>26</sup>	Depreciation <sup>27</sup>	Depreciated Value of Capital Investment	Taxable Capital Investment (less 80% exemption) <sup>28</sup>	Additional Annual County Tax Revenue Solar Investment <sup>29</sup>	TOTAL Additional Annual County Tax Revenue
15		\$101,121	\$552,500,000	58%	\$318,129,500	\$54,909,152	\$457,393	\$558,514
16		\$101,121	\$552,500,000	53%	\$293,985,250	\$50,741,854	\$422,680	\$523,801
17		\$101,121	\$552,500,000	49%	\$268,404,500	\$46,326,617	\$385,901	\$487,022
18		\$101,121	\$552,500,000	44%	\$241,276,750	\$41,644,367	\$346,898	\$448,019
19		\$101,121	\$552,500,000	38%	\$212,546,750	\$36,685,569	\$305,591	\$406,712
20		\$101,121	\$552,500,000	33%	\$182,048,750	\$31,421,614	\$261,742	\$362,863
21		\$101,121	\$552,500,000	27%	\$149,782,750	\$25,852,503	\$215,351	\$316,472
22		\$101,121	\$552,500,000	21%	\$115,527,750	\$19,940,090	\$166,101	\$267,222
23		\$101,121	\$552,500,000	14%	\$79,228,500	\$13,674,839	\$113,911	\$215,032
24		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
25		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
26		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
27		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
28		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
29		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
30		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
31		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
32		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
33		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
34		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
35		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
36		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
37		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
38		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557

**Table 3: Estimated County Revenue Generated by the Proposed SSEC Project over 40-Years (2018 Dollars)**

Year	Roll Back Taxes <sup>24</sup>	Annual County Tax Revenue from Real Estate <sup>25</sup>	Capital Investment <sup>26</sup>	Depreciation <sup>27</sup>	Depreciated Value of Capital Investment	Taxable Capital Investment (less 80% exemption) <sup>28</sup>	Additional Annual County Tax Revenue Solar Investment <sup>29</sup>	TOTAL Additional Annual County Tax Revenue
39		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
40		\$101,121	\$552,500,000	10%	\$55,250,000	\$9,536,150	\$79,436	\$180,557
<b>TOTAL</b>	<b>\$579,121</b>	<b>\$4,044,840</b>					<b>\$12,986,060</b>	<b>\$17,610,021</b>



## Composite Index

In this portion of the section. We present an analysis of the hypothetical upper limit of the impact that the proposed SSEC project could have on Spotsylvania County's Composite Index, the index that the Virginia Department of Education uses to assess the locally funded portion of localities' school budgets based on each locality's "ability to pay." We include this analysis in our report because it has been a perceived issue in other smaller localities in Virginia when proposed solar projects have been considered. However, at the outset we should make clear that, by itself, the proposed SSEC project is unlikely to have any impact on Spotsylvania County's Composite Index or locally funded school budget.

Each locality's Composite Index is based on three factors – the locality's total real property tax base, total adjusted real income, and total taxable retail sales. Of these, the total real property tax base receives the highest weight. Therefore, hypothetically, a large capital investment could increase a locality's Composite Index and thereby increase the required local contribution to the county's school budget.

In actuality, however, changes in a locality's Composite Index are driven by changes in a locality's total real property tax base (along with total adjusted real income and total taxable retail sales) relative to the changes in all Virginia localities total real property tax base (along with total adjusted real income and total taxable retail sales). As a result, for any one capital investment to have an impact on a locality's Composite Index, it would have to drive a percentage change in the locality's total real property tax base that was larger than the percentage change in the total real property tax base across all Virginia localities.

To use a more concrete example, between the Virginia Department of Education's 2016-18 Composite Index and its 2018-20 Composite Index, the increase in the total property tax base across all Virginia localities was 3.8 percent. In a relatively small community such as Greensville County, where the total real property tax base reported in the Virginia Department of Education's 2016-18 Composite Index was \$703.0 million, the addition of \$85.8 million in taxable capital investment, as is the case with the proposed SSEC project, would represent a 12.2 percent increase in the locality's total property tax base. Relative to the 3.8 percent increase across all Virginia localities, that increase most likely would cause an increase in Greensville County's Composite Index and the required local contribution to the county's school budget.

In contrast, in a larger locality such as Spotsylvania County, where the total real property tax base reported in the Virginia Department of Education's 2016-18 Composite Index was \$15.4 billion, the addition of \$85.8 million in taxable capital investment, as is the case with the proposed SSEC project, would only represent a 0.6 percent increase in the locality's total property tax base. Relative to the 3.8 percent increase across all Virginia localities, that increase would not by itself cause an increase in Spotsylvania County's Composite Index or the required local contribution to the county's school budget.

Consistent with reports we have produced for other Virginia localities, Table 4 provides an estimate of the hypothetical upper limit of the impact that the proposed SSEC project could have on Spotsylvania County's Composite Index and the county's share of its school budget over a 40-year period, holding all other changes to the county's property tax base and the property tax base of all other Virginia localities constant.

The calculation presented in Table 4 is derived by: 1) using baseline data for Spotsylvania County on County Taxable Real Property, Adjusted Gross Income, Taxable Retail Sales, County School Average Daily Membership (ADM), and County Population from the Virginia Department of Education's 2018-2020 Composite Index of Local Ability to Pay, 2) adjusting County Taxable Real Property in subsequent years using the Taxable Capital Investment figures from Table 3, and 3) applying those figures to the Virginia Department of Education's composite index formula to compute a revised Composite Index for Spotsylvania County in each subsequent year.<sup>30</sup> That revised Composite Index is then applied to the County of Spotsylvania's baseline FY 2017 locally funded school budget as reported by the Virginia Auditor of Public Accounts to derive a hypothetical upper limit of the additional local school funding that could be required in each subsequent year relative to the baseline, if one holds all other changes to the county's property tax base and the property tax base of all other Virginia localities constant.

As shown in Table 4, based on these calculations, we estimate the hypothetical upper limit of the additional local school funding that could be required as a result of the proposed SSEC project's addition to Spotsylvania County's real property tax base to be approximately \$278,773 in the project's first year of operation, with that figure projected to gradually decline to approximately \$30,975 in the project's 40<sup>th</sup> year of operation as the value of the proposed capital investments is depreciated, for a total cumulative impact of approximately \$5.1 million.

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<sup>30</sup> The Virginia Department of Education's composite index formula is:  $(0.5 * (((0.66) * ((\text{County Taxable Real Property} / \text{County School ADM}) / (\text{State Taxable Real Property} / \text{State School ADM})) + ((0.33) * ((\text{County Taxable Real Property} / \text{County Population}) / (\text{State Taxable Real Property} / \text{State Population})))))) + (0.4 * (((0.66) * ((\text{County Adjusted Gross Income} / \text{County School ADM}) / (\text{State Adjusted Gross Income} / \text{State School ADM})) + ((0.33) * ((\text{County Adjusted Gross Income} / \text{County Population}) / (\text{State Adjusted Gross Income} / \text{State Population})))))) + (0.1 * (((0.66) * ((\text{County Taxable Retail Sales} / \text{County School ADM}) / (\text{State Taxable Retail Sales} / \text{State School ADM})) + ((0.33) * ((\text{County Taxable Retail Sales} / \text{County Population}) / (\text{State Taxable Retail Sales} / \text{State Population}))))))$ .

Table 4: Hypothetical Upper Limit to Change in Composite Index and Required Local Contribution to School Budget from the Proposed SSEC Project over 40-years (2018 Dollars)

Year	County Taxable Real Property <sup>31</sup>	Taxable Proposed Capital Investment <sup>32</sup>	Adj. County Taxable Real Property	Adj. Gross Income <sup>33</sup>	Taxable Retail Sales <sup>34</sup>	County School ADM <sup>35</sup>	County Pop. <sup>36</sup>	Composite Index <sup>37</sup>	Locally Funded School Budget <sup>38</sup>	Change in Locally Funded School Budget
<b>Baseline</b>	\$16,138,769,358			\$3,790,488,329	\$1,547,887,315	23,094	128,998	<b>0.3626</b>	<b>\$106,622,374</b>	<b>\$0</b>
1	\$16,138,769,358	\$85,825,350	\$16,224,594,708	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,901,147	\$278,773
2	\$16,138,769,358	\$85,825,350	\$16,224,594,708	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,901,147	\$278,773
3	\$16,138,769,358	\$85,825,350	\$16,224,594,708	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,901,147	\$278,773
4	\$16,138,769,358	\$85,825,350	\$16,224,594,708	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,901,147	\$278,773
5	\$16,138,769,358	\$85,567,874	\$16,224,337,231	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,900,311	\$277,937
6	\$16,138,769,358	\$83,241,053	\$16,222,010,411	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3636	\$106,892,753	\$270,379
7	\$16,138,769,358	\$80,771,191	\$16,219,540,548	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3635	\$106,884,730	\$262,356
8	\$16,138,769,358	\$78,158,285	\$16,216,927,643	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3635	\$106,876,243	\$253,869
9	\$16,138,769,358	\$75,392,802	\$16,214,162,159	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3635	\$106,867,260	\$244,886
10	\$16,138,769,358	\$72,455,668	\$16,211,225,025	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3634	\$106,857,720	\$235,346
11	\$16,138,769,358	\$69,337,347	\$16,208,106,704	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3634	\$106,847,591	\$225,217

<sup>31</sup> Data Source: Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay.

<sup>32</sup> Data Source: From Table 3.

<sup>33</sup> Data Source: Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay.

<sup>34</sup> Data Source: Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay.

<sup>35</sup> Data Source: Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay.

<sup>36</sup> Data Source: Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay.

<sup>37</sup> Data Source: Baseline data taken from the Virginia Department of Education, 2018-20 Composite Index of Local Ability to Pay. Subsequent annual calculations are based on the Adjusted County Taxable Real Property, Adjusted Gross Income, County School Average Daily Membership (ADM), and County Population data presented for each year.

<sup>38</sup> Data Source: Virginia Auditor of Public Accounts.

Table 4: Hypothetical Upper Limit to Change in Composite Index and Required Local Contribution to School Budget from the Proposed SSEC Project over 40-years (2018 Dollars)

Year	County Taxable Real Property <sup>31</sup>	Taxable Proposed Capital Investment <sup>32</sup>	Adj. County Taxable Real Property	Adj. Gross Income <sup>33</sup>	Taxable Retail Sales <sup>34</sup>	County School ADM <sup>35</sup>	County Pop. <sup>36</sup>	Composite Index <sup>37</sup>	Locally Funded School Budget <sup>38</sup>	Change in Locally Funded School Budget
12	\$16,138,769,358	\$66,037,839	\$16,204,807,196	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3634	\$106,836,874	\$214,500
13	\$16,138,769,358	\$62,538,072	\$16,201,307,429	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3633	\$106,825,506	\$203,132
14	\$16,138,769,358	\$58,838,046	\$16,197,607,403	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3633	\$106,813,488	\$191,114
15	\$16,138,769,358	\$54,909,152	\$16,193,678,509	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3633	\$106,800,727	\$178,353
16	\$16,138,769,358	\$50,741,854	\$16,189,511,212	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3632	\$106,787,191	\$164,817
17	\$16,138,769,358	\$46,326,617	\$16,185,095,974	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3632	\$106,772,849	\$150,475
18	\$16,138,769,358	\$41,644,367	\$16,180,413,725	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3631	\$106,757,641	\$135,267
19	\$16,138,769,358	\$36,685,569	\$16,175,454,927	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3630	\$106,741,534	\$119,160
20	\$16,138,769,358	\$31,421,614	\$16,170,190,972	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3630	\$106,724,436	\$102,062
21	\$16,138,769,358	\$25,852,503	\$16,164,621,860	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3629	\$106,706,347	\$83,973
22	\$16,138,769,358	\$19,940,090	\$16,158,709,447	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3629	\$106,687,142	\$64,768
23	\$16,138,769,358	\$13,674,839	\$16,152,444,197	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3628	\$106,666,792	\$44,418
24	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
25	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
26	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
27	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
28	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
29	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
30	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
31	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
32	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
33	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975

Table 4: Hypothetical Upper Limit to Change in Composite Index and Required Local Contribution to School Budget from the Proposed SSEC Project over 40-years (2018 Dollars)

Year	County Taxable Real Property <sup>31</sup>	Taxable Proposed Capital Investment <sup>32</sup>	Adj. County Taxable Real Property	Adj. Gross Income <sup>33</sup>	Taxable Retail Sales <sup>34</sup>	County School ADM <sup>35</sup>	County Pop. <sup>36</sup>	Composite Index <sup>37</sup>	Locally Funded School Budget <sup>38</sup>	Change in Locally Funded School Budget
34	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
35	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
36	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
37	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
38	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
39	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
40	\$16,138,769,358	\$9,536,150	\$16,148,305,508	\$3,790,488,329	\$1,547,887,315	23,094	128,998	0.3627	\$106,653,349	\$30,975
<b>TOTAL</b>										<b>\$5,063,696</b>

Table 5 combines the results from the calculations depicted in Table 3 and 4 to provide an estimate of the fiscal contribution that the proposed SSEC project would make to Spotsylvania County over 40-years. As these data indicate, even taking into account the hypothetical upper limit of the additional local school funding that could be required as a result of the proposed SSEC project's addition to Spotsylvania County's real property tax base, we estimate county revenue from the project to be approximately \$1.1 million in the project's first year of operation, with that figure projected to gradually decline to approximately \$149,582 in the project's 40<sup>th</sup> year of operation, as the value of the proposed capital investments is depreciated, for a cumulative total of approximately \$12.5 million.

**Table 5: Estimated County Tax Revenue Generated by the Proposed SSEC Project over 40-years, taking into account Hypothetical Upper Limit of Effect on Composite Index (2018 Dollars)**

Year	Gross Additional Annual County Tax Revenue <sup>39</sup>	Change in Locally Funded School Budget <sup>40</sup>	Net Additional Annual County Tax Revenue
1	\$1,395,167	(\$278,773)	\$1,116,394
2	\$816,046	(\$278,773)	\$537,273
3	\$816,046	(\$278,773)	\$537,273
4	\$816,046	(\$278,773)	\$537,273
5	\$813,901	(\$277,937)	\$535,964
6	\$794,519	(\$270,379)	\$524,140
7	\$773,945	(\$262,356)	\$511,589
8	\$752,180	(\$253,869)	\$498,311
9	\$729,143	(\$244,886)	\$484,257
10	\$704,677	(\$235,346)	\$469,331
11	\$678,701	(\$225,217)	\$453,484
12	\$651,216	(\$214,500)	\$436,716
13	\$622,063	(\$203,132)	\$418,931
14	\$591,242	(\$191,114)	\$400,128
15	\$558,514	(\$178,353)	\$380,161
16	\$523,801	(\$164,817)	\$358,984
17	\$487,022	(\$150,475)	\$336,547
18	\$448,019	(\$135,267)	\$312,752
19	\$406,712	(\$119,160)	\$287,552
20	\$362,863	(\$102,062)	\$260,801
21	\$316,472	(\$83,973)	\$232,499
22	\$267,222	(\$64,768)	\$202,454
23	\$215,032	(\$44,418)	\$170,614
24	\$180,557	(\$30,975)	\$149,582
25	\$180,557	(\$30,975)	\$149,582

<sup>39</sup> From Table 5.

<sup>40</sup> From Table 6.

Table 5: Estimated County Tax Revenue Generated by the Proposed SSEC Project over 40-years, taking into account Hypothetical Upper Limit of Effect on Composite Index (2018 Dollars)

Year	Gross Additional Annual County Tax Revenue <sup>39</sup>	Change in Locally Funded School Budget <sup>40</sup>	Net Additional Annual County Tax Revenue
26	\$180,557	(\$30,975)	\$149,582
27	\$180,557	(\$30,975)	\$149,582
28	\$180,557	(\$30,975)	\$149,582
29	\$180,557	(\$30,975)	\$149,582
30	\$180,557	(\$30,975)	\$149,582
31	\$180,557	(\$30,975)	\$149,582
32	\$180,557	(\$30,975)	\$149,582
33	\$180,557	(\$30,975)	\$149,582
34	\$180,557	(\$30,975)	\$149,582
35	\$180,557	(\$30,975)	\$149,582
36	\$180,557	(\$30,975)	\$149,582
37	\$180,557	(\$30,975)	\$149,582
38	\$180,557	(\$30,975)	\$149,582
39	\$180,557	(\$30,975)	\$149,582
40	\$180,557	(\$30,975)	\$149,582
<b>TOTAL</b>	<b>\$17,610,021</b>	<b>(\$5,063,696)</b>	<b>\$12,546,325</b>

## Current Agricultural Use

In this section, we provide a benchmark for the previous estimates of the economic contribution that the proposed SSEC project would make to Spotsylvania County by estimating the economic contribution that the site makes to the county in its current agricultural use. In conducting that analysis, we employ the following assumptions:

- The proposed SSEC project would be situated on an approximately 6,500 acre tract of land.
- Approximately 65 percent of the property is currently used for agricultural production.<sup>41</sup>
- Average revenue per acre for Virginia farmland is approximately \$411.62.<sup>42</sup>
- Real property tax payments by current landowners to Spotsylvania County are approximately \$18,875 each year.<sup>43</sup>

<sup>41</sup> Data Source: sPower.

<sup>42</sup> Data Source: Estimated based on data from the Virginia Department of Agriculture and Consumer Services.

<sup>43</sup> Data Source: sPower and Spotsylvania County Commissioner of the Revenue.

By feeding these assumptions into the IMPLAN model, we obtain the following estimates of annual economic and fiscal impact. As shown in Table 6, in its current agricultural use we estimate that the proposed SSEC project site directly provides approximately: 1) 210 full-time-equivalent jobs, 2) \$809,198 in labor income, and 3) \$1.7 million in economic output to Spotsylvania County. Taking into account the economic ripple effects that direct impact generates, we estimate that the total annual impact on Spotsylvania County is: 1) 228 full-time-equivalent jobs, 2) \$1.2 million in labor income, 3) \$2.8 million in economic output, and 4) \$18,875 in direct real property tax payments to Spotsylvania County, for a cumulative total of \$754,993 over 40-years.

**Table 8: Total Annual Economic Impact of the SSEC Solar Project site on Spotsylvania County – Current Agricultural Use (2018 Dollars)**

Economic Impact	Employment	Labor Income	Output
<b>1<sup>st</sup> Round Direct Economic Activity</b>	216	\$809,198	\$1,739,095
<b>2<sup>nd</sup> Round Indirect and Induced Economic Activity</b>	12	\$380,956	\$1,037,243
<b>Total Economic Activity</b>	<b>228</b>	<b>\$1,190,154</b>	<b>\$2,776,338</b>
<b>Fiscal Impact</b>			
<b>Local Tax Revenue</b>			<b>\$18,875</b>
<b>Cumulative Local Tax Revenue over 40 Years</b>			<b>\$754,993</b>

## Other Considerations

One of the methodological problems associated with conducting economic impact assessments is that not all of the economic effects associated with a given enterprise can easily be captured and quantified in standard simulation models. To compensate for this limitation, in this portion of the section we attempt to at least qualify some of the potential economic effects associated with the proposed SSEC project that cannot be easily quantified.

## State Energy Policy

The proposed SSEC project would be entirely consistent with Virginia’s stated energy policy objectives as presented in Governor McAuliffe’s 2014 Virginia Energy Plan.<sup>44</sup> The very first goal of which is to “accelerate the development of renewable energy sources in the Commonwealth to ensure a diverse fuel mix,” because doing so “will lead to economic prosperity through increased jobs and environmental health through lower harmful emissions.”

<sup>44</sup> Virginia Energy Plan, Virginia Department of Mines, Minerals, and Energy, October 1, 2014.



## Renewable Energy Supports Economic Development

Industrial development prospects with high energy needs are becoming increasingly sensitive to the proportion of their energy requirements that are produced through renewable sources. A good example of this is data centers. According to a recent analysis by the U.S. Chamber of Commerce, energy costs comprise between 40 and 80 percent of a data center's annual operating budget.<sup>45</sup> As a result, data centers are constantly working to reduce their energy footprint. This has caused leading data center companies such as Amazon Web Services (AWS), Apple, Facebook, Google, and Microsoft to move toward sourcing 100 percent of their power needs from renewable energy. And for that reason, data centers have become a driving force behind the development of utility scale renewable energy projects.

Where as recently as 2015 wind and solar energy did not materially contribute to electricity production in Virginia, today Dominion Energy, Virginia's largest electricity producer, has more than 744-megawatts of in-state solar generation capacity that is either operational or under development, and 78 percent of that capacity is directly attributable to partnerships with leading data center companies. One such partnership is Amazon Solar Farm U.S. East, an 80-megawatt solar project located on Virginia's Eastern Shore in Accomack County, Virginia. Construction of that project was made possible as a result of a long-term power purchase agreement with Amazon Web Services, an affiliate of Amazon's cloud computing business.

As this example illustrates, renewable energy is becoming an important asset for localities in promoting technology-driven economic development. And more importantly for Spotsylvania County, data centers are becoming a key component of regional economic development. In nearby Prince William County, data centers accounted for \$1.2 billion in investment in 2016 alone.<sup>46</sup> Moreover, since 2012 data centers have accounted for 92 percent of all industry investment in Prince William County.<sup>47</sup>

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

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<sup>45</sup> Data Source: "Data Centers: Jobs and Opportunities in Communities Nationwide," U.S. Chamber of Commerce, June 2017.

<sup>46</sup> Data Source: Prince William County, Department of Economic Development.

<sup>47</sup> Data Source: "The Economic and Fiscal Contribution that data Center make to Virginia: Spotlight on Prince William County," produced for Northern Virginia Technology Council by Mangum Economics, February 2018.