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THE ECONOMIC CONTRIBUTION OF UTILITY SCALE SOLAR DEVELOPMENT TO VIRGINIA

MANGUM economics

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About Mangum Economics, LLC

Mangum Economics, LLC is a Richmond, Virginia based firm that specializes in producing objective economic, quantitative, and qualitative analysis in support of strategic decision making. Much of our recent work relates to IT & Telecom Infrastructure (data centers, terrestrial and subsea fiber), Renewable Energy, and Economic Development. Examples of typical studies include:

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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 businesses and other enterprises make to their localities.

WORKFORCE ANALYSIS

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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Executive Summary

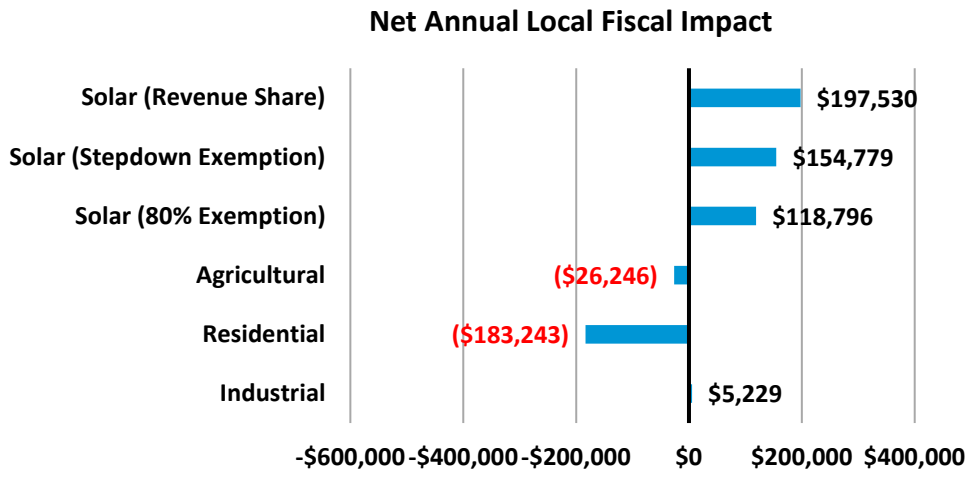
This report provides an analysis of the development of utility scale solar energy in Virginia, the factors driving that development, and what it means for host localities within the state. The most salient findings from that analysis are:

1. **Utility scale solar energy is advancing rapidly, both at the national level and here in Virginia. According to data from the U.S. Energy Information Administration, nationally the amount of electricity generated by utility scale solar facilities increased from 0.9 million megawatt hours in 2008 to 63.8 million megawatt hours in 2018 – an increase of 7,284 percent over ten years. While here in Virginia, electricity generated by utility scale solar facilities increased from zero megawatt hours as recently as 2015 to 0.8 million megawatt hours in 2018.**
2. **There are several factors driving this surging interest in solar:**
    - Utility scale solar facilities can be particularly attractive for rural communities that are facing demographic, economic, and fiscal challenges as the focus of economic activity in Virginia continues to shift toward the urban centers within the I-95/I-64 corridor.
    - Many rural communities in Virginia are experiencing declining population and labor force, and below average economic growth. As a result, many are struggling to maintain local services in the face of a stagnant or shrinking tax base.
    - With new legislation enacted in the 2020 General Assembly, utility scale solar facilities can generate local tax revenue from two of three sources: 1) revenue share agreements in lieu of taxes on equipment, 2) taxes on equipment, and 3) a typically eleven-fold increase in property taxes as the land on which the facility is built is rezoned from agricultural or the heavily subsidized Land Use program.
    - Local governments in Virginia obtain about 66 percent of their overall revenue from property taxes, while spending about 53 percent of their overall budgets on education. Because utility scale solar is a capital-intensive industry that generates substantial investments in capital equipment while employing relatively fewer people, it also generates substantial local tax revenue while imposing few costs on local services. That provides localities with a high benefit to cost ratio.
    - In times of economic uncertainty, utility scale solar facilities provide localities with a dependable, constant, and near-zero-risk source of tax revenue that helps to balance their revenue portfolios and reduce downside fiscal risk.

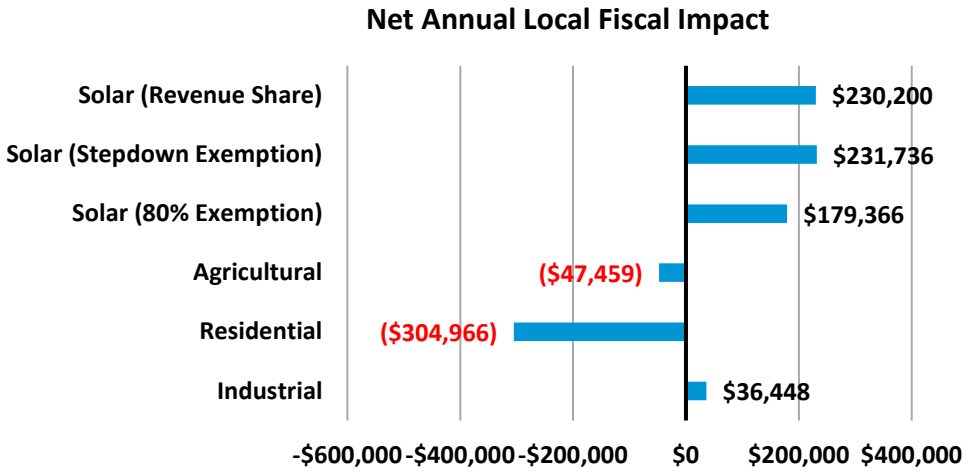
3. **Utility scale solar has a high net fiscal impact on localities relative to other likely economic development alternatives:**

   - We compared the local net fiscal impact associated with a typical 100 megawatt utility scale solar facility to the three most common alternative uses for that property: 1) a 1,000 acre farm, 2) a 200 single-family home residential development, and 3) a $12.9 million manufacturing facility.
   - Our analysis focused on the three regions of Virginia that have experienced the largest number of interconnection requests filed with PJM for utility scale solar projects: 1) South-Central Virginia, 2) North-Central Virginia, and 3) Southeastern Virginia.
   - Our analysis considered the direct fiscal benefit of each use in terms of major applicable business or residential taxes as well as the indirect fiscal benefit from major local taxes paid by employees or residents, along with the indirect fiscal cost in terms of local educational and other services provided to employees.
   - In each case, the specific scenario was based on current local economic, demographic, and fiscal data. As a result, the assumptions used in the scenarios were region-specific.
   - **Taking into account both the direct and indirect fiscal benefits and costs provided the following <u>net</u> annual fiscal impact for each alternative use:**

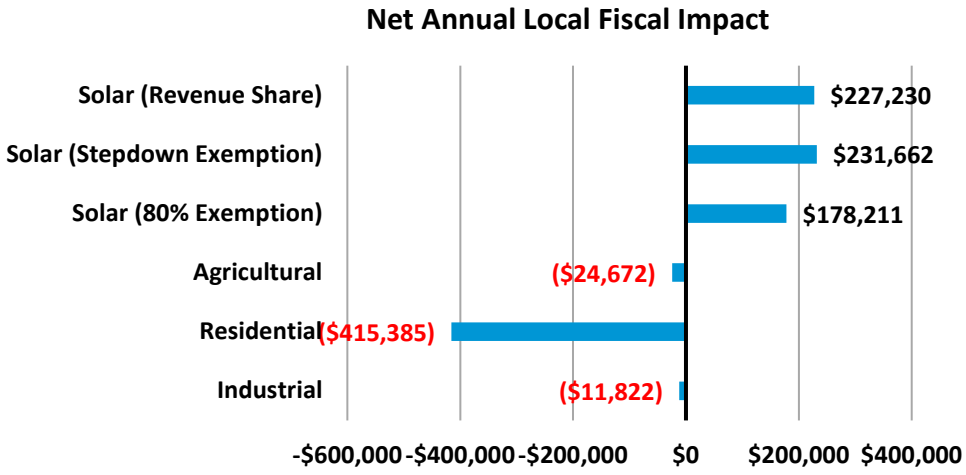
     - <u>South-Central Virginia</u>: (the counties of Campbell, Halifax, Henry, Mecklenburg, and Pittsylvania)



- North-Central Virginia: (the counties of Caroline, Culpeper, Fauquier, Hanover, and Spotsylvania)



- Southeastern Virginia: (the city of Chesapeake and the counties of Greensville, Isle of Wight, Southampton, Surry, and Sussex)



- **In short, utility scale solar can be a viable economic development alternative for many localities.**

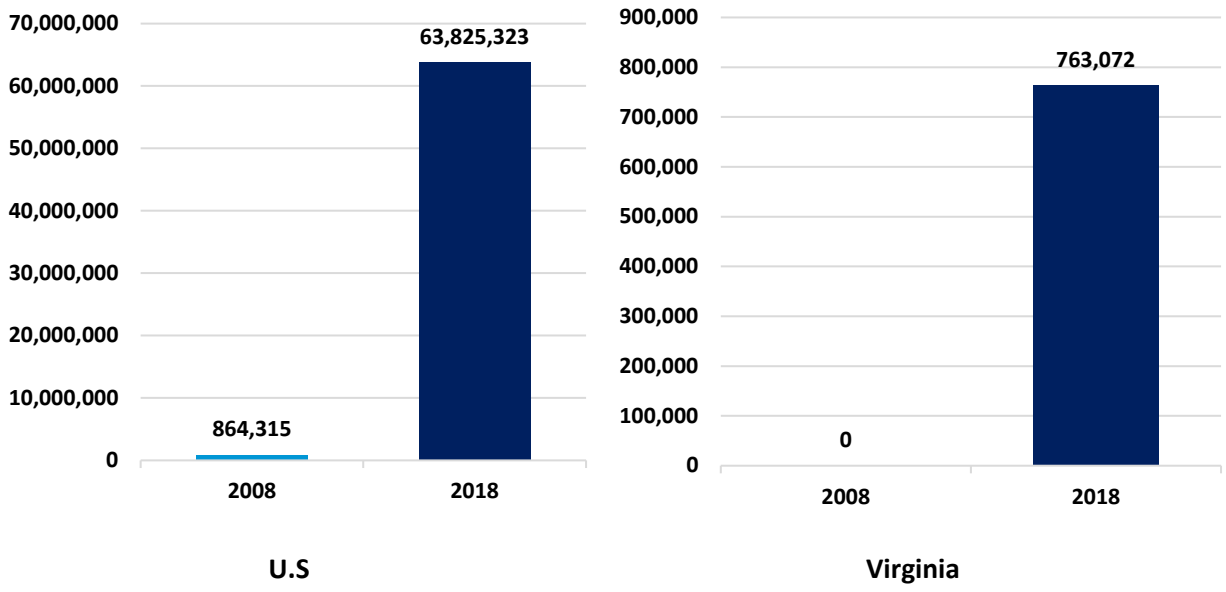
Introduction

In this report, we provide an analysis of the development of utility scale solar energy in Virginia, the factors driving that development, and what it means for host localities within the state. This report was commissioned by the Maryland-DC-Delaware-Virginia Solar Energy Industries Association (MDV-SEIA) and produced by Mangum Economics.

Deployment of Solar Energy is Advancing Rapidly

Utility scale solar energy is advancing rapidly, both at the national level and here in Virginia. According to data from the U.S. Energy Information Agency, nationally the amount of electricity generated by utility scale solar facilities increased from 0.9 million megawatt hours in 2008 to 63.8 million megawatt hours in 2018 – an increase of 7,284 percent over ten years. While here in Virginia, electricity generated by utility scale solar facilities increased from zero megawatt hours as recently as 2015 to 0.8 million megawatt hours in 2018.

Figure 1: Megawatt Hours of Electricity Production from Solar Energy [1]



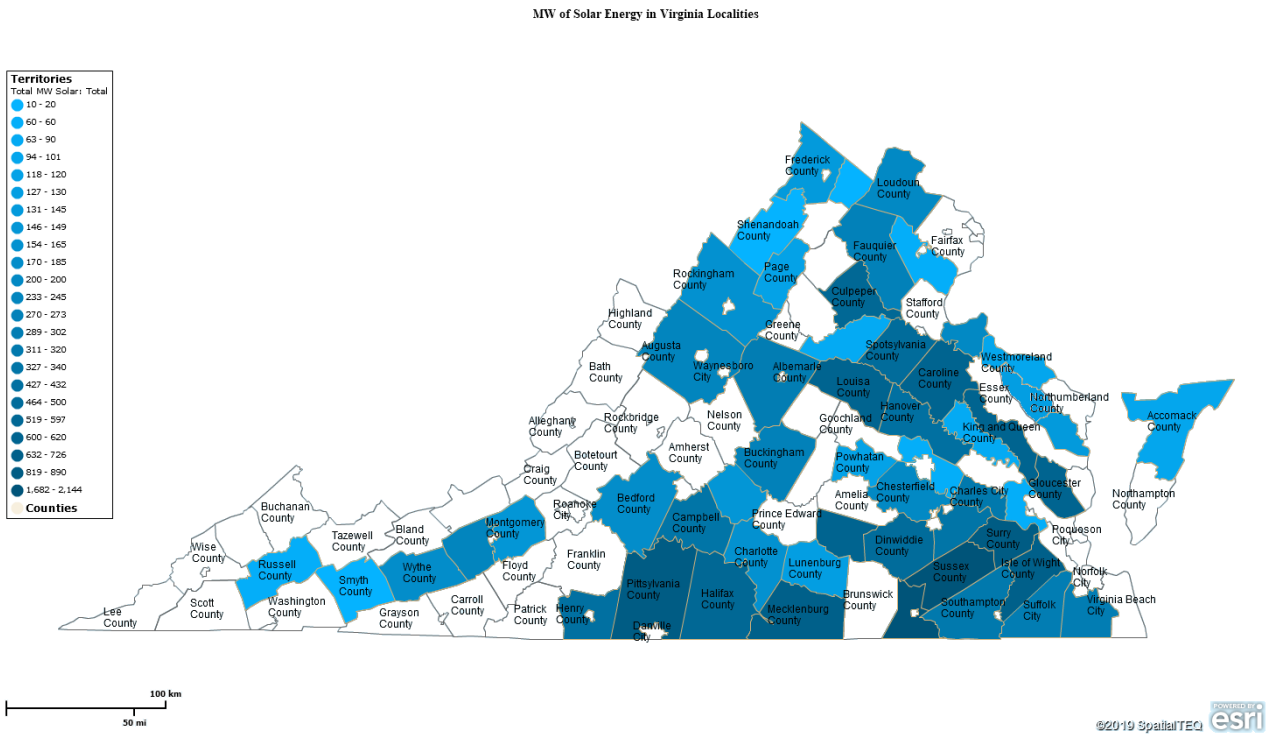
Moreover, additional utility scale solar facilities are coming on line every day. PJM is the regional transmission organization that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. Filing an interconnection request is the first step in the development of a utility scale solar energy facility. Figure 2 provides a heat

[1] Data Source: U.S. Energy Information Administration.

map for the 16,605 megawatts of interconnection requests filed with PJM for utility scale solar projects between July 2015 and September 2019.

In this map, the megawatts of solar energy proposed in each of the 54 Virginia localities for which interconnection requests were filed increase as the shading goes from light to dark blue. As these data indicate, the largest amount of proposed utility scale solar development over this period occurred in localities in South-Central Virginia, North-Central Virginia, and Southeastern Virginia. However, it is important to note that only about a third of the projects for which an interconnection request is filed ever actually become operational.

Figure 2: Interconnection Requests Filed with PJM for Utility Scale Solar Projects in Virginia between July 2015 and September 2019 (in megawatts)[2]



[2] Data Source: PJM.

Why Solar?

One of the main reasons for the sudden interest in solar is that utility scale solar facilities are a capital intensive industry that generates substantial local tax revenue, while imposing few if any costs on local services. That makes them an attractive way to diversify the economic portfolio of many localities.

Demographic and Economic Trends in Prospective Host Localities

Utility scale solar facilities can be particularly attractive for rural communities that are facing demographic, economic, and fiscal challenges as the focus of economic activity in Virginia continues to shift toward the urban centers within the I-95/I-64 corridor. In this portion of the section we look at recent trends in the 54 largely rural Virginia localities for which interconnection requests were filed with PJM for utility scale solar facilities between July 2015 and September 2019.

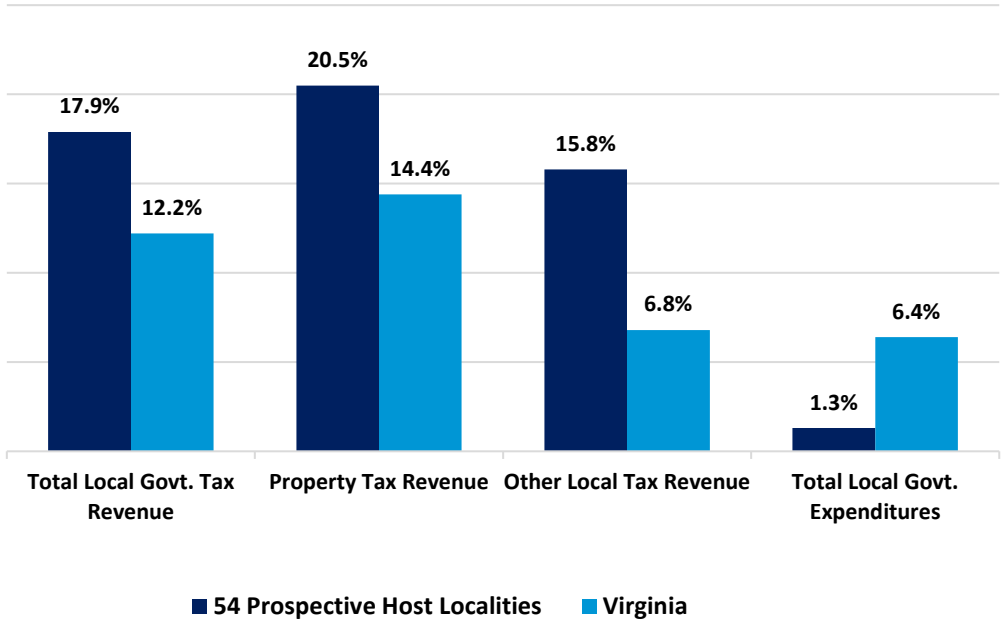
That evaluation shows that many of these 54 prospective host localities are facing negative demographic and economic trends. More specifically:

- Between the 2010 decennial census and 2018, 21 experienced a decline in population.
- Over the five-year period from 2013 to 2018, 17 experienced a decline in labor force.
- Over the five-year period from 2013 to 2018, 4 experienced a decline in employment.

Significantly, these adverse demographic and economic trends were also correlated with above average per capita growth in tax revenue and below average per capita growth in expenditures on government services. More specifically, over the five-year period from 2013 to 2018:

- Total per capita local revenue increased by 12.2 percent statewide, while in the 54 prospective host localities it increased by 17.9 percent.
- Total per capita local property tax revenue increased by 14.4 percent statewide, while in the 54 prospective host communities it increased by 20.5 percent.
- Total per capita local other tax revenue (*e.g.*, local sales tax, utility tax, meals tax, etc.) increased by 6.8 percent statewide, while in the 54 prospective host communities it increased by 15.8 percent.
- Total per capita local expenditures increased by 6.4 percent statewide, while in the 54 prospective host communities it increased by 1.3 percent.

Figure 3: Change in Local Per Capita Tax Revenue and Local Per Capita Government Expenditures – 2013 to 2018 [3]



Taken together, these data indicate that over this period the per capita tax burden increased by more in these 54 prospective host localities than it did statewide, while per capita expenditures on local government services increased by less than it did statewide. All else equal, this is exactly what one would expect if these localities were struggling to maintain local services in the face of shrinking population and labor force, and therefore a shrinking tax base tax base.

High Benefit to Cost Ratio

Local governments in Virginia obtain about 66 percent of their overall revenue from property taxes, while spending about 53 percent of their overall budgets on education.[4] As a result, industries such as utility scale solar, that involve substantial investments in capital equipment while employing relatively few people, generate substantial local tax revenue while imposing few costs on local services. As will be addressed more fully in the Comparative Net Fiscal Impact section, that translates into a high benefit to cost ratio for local governments.

[3] Data Source: Virginia Auditor of Public Accounts.

[4] Data Source: Virginia Auditor of Public Accounts.

With new legislation that was enacted in the 2020 General Assembly Session, utility scale solar facilities in Virginia can now generate local tax revenue from two of three sources:

- Revenue share agreement:

  Section 58.1-2636 of the Code of Virginia was enacted in the 2020 General Assembly. Pursuant to that code section, any locality may by ordinance assess a revenue share of up to $1,400 per megawatt AC on solar facilities, if the facility is more than 20 megawatts (if an interconnection request was filed on or before December 31, 2018 and it does not serve a public or private institution of higher education), or more than 5 megawatts AC (if an interconnection request was filed on or after January 1, 2019).

  If a locality adopts a revenue share ordinance, solar facilities receive a 100 percent exemption from local taxes on equipment (*e.g.*, the solar panels and supporting equipment), although the provision does not apply retroactively to existing facilities, unless the owner and the locality mutually agree to enter into such an arrangement.

- Taxes on equipment (*e.g.*, the solar panels and supporting equipment):

  Absent a revenue share agreement, local taxes on solar equipment are governed by §58.1-3660 of the Code of Virginia. That code section stipulates that solar facilities:

  - Greater than 5 megawatts AC and less than 150 megawatts AC (for which an interconnection request was filed on or after January 1, 2019), are subject to an 80 percent exemption from local taxation for the first five years of service, declining to a 70 percent exemption in the second five years, and a 60 percent exemption for all remaining years of service. This portion of the section was enacted in the 2020 General Assembly and is commonly referred to as the "stepdown provision."
  - Greater than 20 megawatts AC (if an interconnection request was filed between January 1, 2015 and June 30, 2018), or greater than 5 megawatts AC and less than 150 megawatts AC (if an interconnection request was filed between July 1, 2018 and January 1, 2019), and for which construction starts on or before December 31, 2023, are subject to an 80 percent exemption from local taxation.
  - Of 20 megawatts AC or less (if an interconnection request was filed on or before December 31, 2018 or that serve a public or private institution of higher education), or 5 megawatts AC or less (if an interconnection request was filed on or after January 1, 2019) are exempt from local taxation.

  §58.1-2606 of the Code of Virginia further stipulates that the local tax rate on capital equipment in solar facilities shall be capped at the locality's real property tax rate.

- Increased assessments on the land on which the solar facility is built:

  Because §58.1-3660 of the Code of Virginia specifically states that the land upon which the solar facility is constructed is itself not exempt from local taxation, increased assessment of that land can also generate substantial additional local tax revenue.

Generally, the land upon which solar facilities are constructed is zoned agricultural, which is a zoning category that typically benefits from low assessment rates. In addition, often the property is in Land Use, a state and local program that allows eligible agricultural land to be taxed on the land's use value as opposed to its market value. Land use assessments are frequently less than a third of the already low agricultural assessment.

As a result, rezoning the land upon which a solar facility is constructed from agricultural to industrial typically generates a large increase in local real property tax revenue because the value at which the property is assessed increases from as little as less than $1,000 per acre to around $11,000 per acre – generating an eleven-fold or greater increase in tax revenue.

As will be demonstrated in the Comparative Net Fiscal Impact section to follow, even after fully accounting for all local tax exemptions these revenue streams, combined with the low impact that utility scale solar facilities have on local services, translate into a high relative benefit to cost ratio for local governments.

Composite Index

One concern that has been raised about utility scale solar facilities is the impact that a solar facility can have on a locality'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." Each locality's Composite Index is based on three factors – the locality's total taxable property 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 such as a solar facility could increase a locality's Composite Index and thereby increase the required local contribution to the county's school budget. However, there are three important issues to keep in mind when evaluating the real-life impact that a solar project could have on a locality's Composite Index.

First, solar equipment is exempt from local property tax in those localities that enact a revenue share agreement. As a result, it does not count as taxable property and has no impact on the computation of a locality's Composite Index.

Second, when calculating a locality's Composite Index, utility scale solar facilities are treated no differently than manufacturing facilities, residential neighborhoods, or any other large capital investment. The part of the investment that is taxable is included in the real property tax base portion of the calculation. Pursuant to Virginia Code §58.1-3660, that means for solar facilities over 5 megawatts AC and under 150 megawatts AC, the 20 percent (or 20 to 40 percent with the step down) of the investment that is taxable is considered in the Composite Index, and only that 20 percent (or 20 to 40 percent with the step down).

Third, changes in a locality's Composite Index are driven by changes in a locality's total taxable property 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. Between the Virginia Department of Education's 2018-20 and 2020-22 Composite Index calculations, the total real property tax base across all Virginia localities increased by 7.3 percent.

Seven point three percent of the City of Norton's $268 million total real property tax base is substantially different from 7.3 percent of Fairfax County's $263 billion total real property tax base. But on average across all Virginia localities, for a single solar project to trigger a change in a locality's Composite Index it would take a total capital investment of around $3.4 billion, once one takes into account the fact that 80 percent (or 80 to 60 percent with the step down) of that investment would be untaxable and would therefore not add to the locality's real property tax base. Not even the largest utility scale solar facility comes even close to approaching that level of investment.

In fact, a review of the Virginia Department of Education's 2020-22 Composite Index calculations shows that the typical total capital investment for a 100 megawatt utility scale solar facility, which is around $134 million, by itself would only trigger a Composite Index increase in three Virginia localities and those three are the cities of Buena Vista, Emporia, and Norton. None of which would likely qualify as a host locality for a 100 megawatt solar project because of their limited geographic size.

Revenue Stability

From 2017 through February of 2020, the nation as a whole and many localities were experiencing levels of economic growth and employment that were the best they had seen in half a century. Many understandably built their forward looking plans on the expectation that those good times would continue for the foreseeable future. But, the Covid19 virus has suddenly and dramatically changed all that. The non-partisan Congressional Budget Office is now projecting a 14 percent decline in GDP in the second quarter of 2020. And in April alone, the U.S. unemployment rate shot up to 14.7 percent, 20.5 million Americans lost their jobs, and an additional 6.4 million dropped out of the workforce.

To put those numbers in perspective, in the Great Depression – the worst economic downturn the country has ever experienced – the largest annual decrease in GDP was just 13 percent and we did not reach that level until the third full year of the depression in 1932, while unemployment did not reach 14 percent until the second full year in 1931. This time, we are hitting those regrettable benchmarks, not in years, but in weeks. That dramatic change of events will have profound negative impacts on individuals as their income is adversely affected and on localities as their sales tax, meals tax, accommodation tax, and other local revenue streams are adversely impacted as a result.

This unfortunate event is a reminder that, as much as we might want it to be otherwise, the future is truly unknowable and the risk of an economic downturn is always with us. Just as individuals minimize downside risk by diversifying their investment portfolio between higher-risk stocks and near-zero-risk

bonds, localities can also minimize their downside risk by ensuring they have a similarly diversified tax base. Because it provides a dependable, constant, and near-zero-risk source of local tax revenue that is largely immune to economic fluctuations, solar development can be a key component of that diversification strategy.

Comparative Net Fiscal Impact by Region

In this section we compare the local net fiscal impact associated with a typical 100 megawatt solar facility to the three most common alternative uses for that property: 1) agricultural use, 2) residential development, and 3) industrial development. In addition, we calculate those comparisons for the three regions of Virginia that have experienced the largest number of interconnection requests filed with PJM for utility scale solar projects: 1) South-Central Virginia, 2) North-Central Virginia, and 3) Southeastern Virginia.

For purposes of this analysis, we define fiscal benefits as the direct and induced local tax revenue generated by a particular use, while fiscal costs are defined as the cost of local government services required to meet the needs of the number of employees or residents associated with a particular use.

Region 1: South-Central Virginia

We define Region 1 to include the counties of Campbell, Halifax, Henry, Mecklenburg, and Pittsylvania. In combination, 2,803 megawatts of interconnection requests were filed with PJM for utility scale solar projects in these localities between July 2015 and September 2019.

Hypothetical Solar Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical solar development used in our analysis is a 100 megawatt facility, with $134 million in total capital investment, and no direct employment.[5]
- The hypothetical solar development would be situated on an approximately 1,000-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[6]
- Average real property tax rates in the region are $0.523 per $100 of assessed value.[7]

[5] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.
[6] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.
[7] Based on an average of existing county real estate tax rates within the region.

- The State Corporation Commission's average 2019 assessment ratio for taxation of public utilities in the region is 0.9646.[8]
- The hypothetical solar development would have an expected operational life of 35 years.[9]

Fiscal Benefits

Tables 2 through 4 detail the additional annual revenue that the hypothetical solar facility would generate for its host locality over a 35-year period. These calculations are based on the local tax revenue from the $134 million in capital equipment and improvements or a hypothetical revenue share agreement between the solar company and locality, as well as the reassessed value of the land after rezoning.

- Local tax revenue from the capital equipment and improvements is calculated as:
    - The taxable portion of capital investments pursuant to Virginia Code §58.1-3660:
        - 80 percent local tax exemption for projects with an initial interconnection request before January 1, 2019 (*see* Table 2a), or
        - Stepdown local tax exemption (80 percent in years 1-5, 70 percent in years 6-10, and 60 percent in years 11+) for projects with an initial interconnection request on or after January 1, 2019 (*see* Table 2b), times
    - the State Corporation Commission's 2019 0.9646 average utility assessment ratio for taxation of public utilities in Region 1, times
    - the State Corporation Commission's depreciation guidelines for solar facilities, times
    - the average real property tax rate of $0.523 per $100 of assessed value in the region pursuant to Virginia Code §58.1-2606.
- Local annual revenue share is subject to a locality having adopted a revenue share ordinance under Virginia Code §58.1-2636 and is calculated as:
    - Annual revenue share of $1,400 per megawatt (MW) alternating current (AC) times 100 megawatt generation capacity of the solar facility.
    - The Code stipulates that the capital investments of the solar project will be exempt from taxation if the locality and solar company enter into such a revenue share agreement.
- Local real estate tax revenue from the land is calculated as the average regional property tax rate, times $11,000 per acre of assessed value, times 1,000 acres. It is important to note that this estimate does not include any "roll back" taxes that would be due as a result of removing the property from the Land Use program.

[8] Based on an average of State Corporation Commission's local 2019 utility assessment ratios for taxation of public utilities within the region.

[9] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

80 Percent Exemption

As shown in Table 2a, based on these calculations we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the 80 percent exemption (for projects with an initial interconnection request before January 1, 2019) would be approximately $121,682 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $13,520 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $61,266 (in 2020 dollars).

Table 2a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 1, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[10]	Depreciation[11]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[12]
1	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
2	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
3	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
4	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
5	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
6	$134,000,000	$25,851,280	87%	$22,490,614	$117,626
7	$134,000,000	$25,851,280	85%	$21,973,588	$114,922
8	$134,000,000	$25,851,280	82%	$21,198,050	$110,866
9	$134,000,000	$25,851,280	79%	$20,422,511	$106,810
10	$134,000,000	$25,851,280	76%	$19,646,973	$102,754
11	$134,000,000	$25,851,280	73%	$18,871,434	$98,698
12	$134,000,000	$25,851,280	69%	$17,837,383	$93,290
13	$134,000,000	$25,851,280	66%	$17,061,845	$89,233
14	$134,000,000	$25,851,280	62%	$16,027,794	$83,825
15	$134,000,000	$25,851,280	58%	$14,993,742	$78,417
16	$134,000,000	$25,851,280	53%	$13,701,178	$71,657
17	$134,000,000	$25,851,280	49%	$12,667,127	$66,249

[10] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an 80 percent exemption from local taxes on capital equipment and improvements if an initial interconnection request has been filed before January 1, 2019, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[11] Data Source: State Corporation Commission guidelines.

[12] 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 the assumed average real property tax rate of $0.523 per $100 of assessed value.

Table 2a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 1, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[10]	Depreciation[11]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[12]
18	$134,000,000	$25,851,280	44%	$11,374,563	$59,489
19	$134,000,000	$25,851,280	38%	$9,823,486	$51,377
20	$134,000,000	$25,851,280	33%	$8,530,922	$44,617
21	$134,000,000	$25,851,280	27%	$6,979,846	$36,505
22	$134,000,000	$25,851,280	21%	$5,428,769	$28,392
23	$134,000,000	$25,851,280	14%	$3,619,179	$18,928
24	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
25	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
26	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
27	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
28	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
29	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
30	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
31	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
32	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
33	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
34	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
35	$134,000,000	$25,851,280	10%	$2,585,128	$13,520
Cumulative Total					**$2,144,307**
Average Annual					**$61,266**

Stepdown Exemption

As shown in Table 2b, based on these calculations we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the stepdown exemption (for projects with an initial interconnection request on or after January 1, 2019) would be approximately $121,682 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $27,040 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $97,249 (in 2020 dollars).

Table 2b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 1, Stepdown Exemption

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[13]	Depreciation[14]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[15]
1	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
2	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
3	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
4	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
5	$134,000,000	$25,851,280	90%	$23,266,152	$121,682
6	$134,000,000	$38,776,920	87%	$33,735,920	$176,439
7	$134,000,000	$38,776,920	85%	$32,960,382	$172,383
8	$134,000,000	$38,776,920	82%	$31,797,074	$166,299
9	$134,000,000	$38,776,920	79%	$30,633,767	$160,215
10	$134,000,000	$38,776,920	76%	$29,470,459	$154,131
11	$134,000,000	$51,702,560	73%	$37,742,869	$197,395
12	$134,000,000	$51,702,560	69%	$35,674,766	$186,579
13	$134,000,000	$51,702,560	66%	$34,123,690	$178,467
14	$134,000,000	$51,702,560	62%	$32,055,587	$167,651
15	$134,000,000	$51,702,560	58%	$29,987,485	$156,835
16	$134,000,000	$51,702,560	53%	$27,402,357	$143,314
17	$134,000,000	$51,702,560	49%	$25,334,254	$132,498
18	$134,000,000	$51,702,560	44%	$22,749,126	$118,978
19	$134,000,000	$51,702,560	38%	$19,646,973	$102,754
20	$134,000,000	$51,702,560	33%	$17,061,845	$89,233
21	$134,000,000	$51,702,560	27%	$13,959,691	$73,009
22	$134,000,000	$51,702,560	21%	$10,857,538	$56,785
23	$134,000,000	$51,702,560	14%	$7,238,358	$37,857
24	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
25	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
26	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
27	$134,000,000	$51,702,560	10%	$5,170,256	$27,040

[13] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an exemption from local taxes on capital equipment and improvements (80 percent in years 1-5, 70 percent in years 6-10, and 60 percent in years 11+) if an initial interconnection request has been filed on or after January 1, 2019, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[14] Data Source: State Corporation Commission guidelines.

[15] 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 the assumed average real property tax rate of $0.523 per $100 of assessed value.

Table 2b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 1, Stepdown Exemption

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[13]	Depreciation[14]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[15]
28	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
29	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
30	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
31	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
32	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
33	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
34	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
35	$134,000,000	$51,702,560	10%	$5,170,256	$27,040
Cumulative Total					**$3,403,715**
Average Annual					**$97,249**

Revenue Share

Table 2c details the revenue generated from a revenue share agreement between the solar company and locality. Based on a total generation capacity of 100 MW AC and a revenue share of $1,400 per MW, the locality would receive a revenue of $140,000 per year over the anticipated 35-year operational life of the project (in 2020 dollars).

Table 2c: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years under a Revenue Share Agreement (2020 Dollars), Region 1

Estimated Total Generation Capacity (in MW AC)	100
Revenue Share per MW	$1,400
Annual County Revenue Share	**$140,000**
Cumulative Total	**$4,900,000**

Table 3 provides a similar calculation for the estimated annual local real estate tax revenue from the reassessed value of the land after rezoning. As these data indicate, based on an assumed 1,000 acre tract, a $11,000 per acre reassessed value after rezoning, and an average regional real property tax rate of $0.523 per $100 of assessed value, we estimate the annual local revenue from taxation of land alone would be $57,530 (in 2020 dollars) for all three scenarios (80 percent exemption, stepdown exemption and revenue share).

Table 3: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility from Reassessed Value of Land (2020 Dollars) – Region 1

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Estimated Increased Appraised Value of Property under Solar Use	$11,000,000	$11,000,000	$11,000,000
Average Regional Real Estate Tax Rate	0.00523	0.00523	0.00523
Annual Local Real Estate Tax Revenue	**$57,530**	**$57,530**	**$57,530**

Table 4 simply combines the annual local revenue estimates from Tables 2a-c and 3 to provide an estimate of total annual local revenue from a hypothetical 100 megawatt solar facility. As shown, we estimate that figure to be $118,796 per year on average for the 80 percent exemption scenario, $154,779 per year on average for the stepdown scenario, and $197,530 per year for the revenue share scenario over the anticipated 35-year life of the facility (in 2020 dollars).

Table 4: Estimated Total Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 1

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Average Annual Local Revenue from Taxation of Capital Investments / Revenue Share	$61,266	$97,249	$140,000
Annual Local Revenue from Taxation of Land	$57,530	$57,530	$57,530
TOTAL Average Annual Local Revenue	**$118,796**	**$154,779**	**$197,530**

Fiscal Costs

Because the hypothetical 100 megawatt solar facility is assumed to provide no direct employment, and based on our premise that fiscal costs are comprised of the local government services required to meet the needs of the number of employees or residents associated with a particular use, we estimate that the hypothetical solar facility would impose zero fiscal costs on its host locality.

Net Fiscal Impact

Table 5 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 100 megawatt solar facility on Region 1. As shown, that estimate is $118,796 annually for the 80 percent exemption scenario, $154,779 annually for the stepdown scenario and $197,530 for the revenue share scenario.

Table 5: Estimated Net Local Fiscal Impact from a Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 1

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Annual Local Fiscal Benefit	$118,796	$154,779	$197,530
Annual Local Fiscal Cost	$0	$0	$0
Net Annual Fiscal Impact	**$118,796**	**$154,779**	**$197,530**

Hypothetical Agricultural Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical agricultural enterprise used in our analysis encompasses the entire 1,000 acre site, generates $284.00 per acre in annual revenue, and directly employs 18 individuals.[16]
- The assessed value of the 1,000 acre site would be $947 per acre.[17]
- The average real property tax rate is $0.523 per $100 of assessed value.[18]
- The average median home value is $125,989.[19]
- Home ownership per employee is 0.69.[20]
- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.43 per $100 of assessed value.[21]
- The average number of local residents per employee is 2.3.[22]

[16] Data Sources: 1) the $284.00 in annual revenue per acre is an average of farm revenue per acre for localities within the region from the U.S. Department of Agriculture, 2017 Census of Agriculture, and 2) the direct employment of 18 workers is based on the $284.00 annual revenue estimate and derived using a region specific analysis from the IMPLAN economic impact simulation model.

[17] Based on an average of typical local assessments for agricultural land in the Land Use program and experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[18] Based on an average of local real estate tax rates across the localities in the region.

[19] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.

[20] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

[21] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[22] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

- Annual per employee local sales tax revenue is $195.60.[23]
- Annual per employee local meals tax revenue is $30.22.[24]
- Annual per employee local utility tax revenue is $66.05.[25]
- Annual per employee cost for locally funded non-educational services is $1,715.96.[26]
- Annual per employee cost for locally funded educational services is $988.61.[27]

Fiscal Benefits

Table 6 details the additional annual revenue that a hypothetical agricultural enterprise would generate for its host locality. This calculation is based on the direct local tax revenue from the agricultural enterprise itself and induced local tax revenue from the employees of the agricultural enterprise.

- Direct local tax revenue from the agricultural enterprise itself is calculated as the average real property tax rate, times $947 per acre of assessed value, times 1,000 acres.
- Induced local tax revenue from the employees of the agricultural enterprise is calculated as:
    - Real Estate Tax: the average median home price across localities in the region, times the average real estate tax rate across localities in the region, times the number of employees, times average home ownership rates across the region.
    - Personal Property Tax: the assumed value of vehicles, times one vehicle per employee, times the average personal property tax rate for vehicles across the region.
    - Local Sales, Meals, and Utility Taxes: the average per capita sales tax, meals tax, and utility tax revenue across localities in the region, times the average number of local residents per employee across localities in the region.

[23] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[24] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[25] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[26] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[27] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

As shown in Table 6, based on these calculations we estimate that the total of direct local tax revenue from the agricultural enterprise and induced local tax revenue from the employees of the enterprise is $22,436 annually (in 2020 dollars).

Table 6: Estimated Total Annual Local Revenue Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 1

Direct Local Revenue from the Business		
Revenue Source	**Total Assessed Value**	**Local Revenue**
Real Estate Tax	$947,000	$4,954
Total Direct Local Revenue from Business		**$4,954**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**
Real Estate Tax	$457.71	$8,239
Personal Property Tax	$221.60	$3,989
Local Sales Tax	$195.60	$3,521
Meals Tax	$30.22	$544
Utility Tax	$66.05	$1,189
Total Induced Local Revenue from Employees		**$17,482**
TOTAL Annual Local Revenue		**$22,436**

Fiscal Costs

Table 7 details the additional annual local government services required to meet the needs of the employees of the agricultural enterprise. This calculation is based on multiplying annual locally funded non-educational and educational local government services cost per employee times the total number of employees. Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the agricultural enterprise are $48,682 annually (in 2020 dollars).

Table 7: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 1

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$988.61	$17,795
Other Local Services	$1,715.96	$30,887
TOTAL Induced Local Government Services Expenditures for Employees		**$48,682**

Net Fiscal Impact

Table 8 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 1,000 acre agricultural enterprise on Region 1. As shown, that estimate is minus $26,246 annually.

Table 8: Estimated Net Local Fiscal Impact from a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 1

Annual Local Fiscal Benefit	$22,436
Annual Local Fiscal Cost	($48,682)
Net Annual Fiscal Impact	**($26,246)**

Hypothetical Residential Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical residential development used in our analysis encompasses 200 new single family units with an average assessed value of $214,490.[28]
- The average real property tax rate is $0.523 per $100 of assessed value.[29]
- Average residents per household in the region is 2.4.[30]

[28] Based on an average new construction single family building permit value in the region, U.S. Census Bureau, 2018 Building Permits Survey.

[29] Based on an average of local real estate tax rates across the localities in the region.

[30] Based on an average household size in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.

- New residents of the development would represent a net increase in population to the host community as they would either be new residents, or existing residents whose previous residences would be rented/sold to someone else.
- Average vehicles per household in the region is 2.04.[31]
- The average assessed vehicle value is $5,000 and the personal property tax rate applied to that personal property is $4.43 per $100 of assessed value.[32]
- Annual per household local sales tax revenue is $201.95.[33]
- Annual per household local meals tax revenue is $31.20.[34]
- Annual per household local utility tax revenue is $68.19.[35]
- Annual per household cost for locally funded non-educational services is $1,772.72.[36]
- Annual per household cost for locally funded educational services is $1,020.74.[37]

Fiscal Benefits

Table 9 details the additional annual revenue that a hypothetical residential development would generate for its host locality. This calculation is based on the direct local tax revenue from the households located in the development and is calculated as follows:

- Real Estate Tax: the average new home assessed value across localities in the region, times the average real estate tax rate across localities in the region, times the number of housing units.
- Personal Property Tax: the assumed value of vehicles, times the average number of vehicles per household in the region, times the number of housing units, times the average personal property tax rate for vehicles across the region.
- Local Sales, Meals, and Utility Taxes: the average per capita sales tax, meals tax, and utility tax revenue across localities in the region, times the average number of local residents per household time the number of housing units.

[31] Based on an average vehicles per household in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.
[32] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.
[33] Based on an average of 2017 per capita local sales tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[34] Based on an average of 2017 per capita meals tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[35] Based on an average of 2017 per capita utility tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[36] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[37] Based on an average of 2017 per capita expenditures for locally-funded educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.

As shown in Table 9, based on these calculations we estimate that the total direct local tax revenue from the households of the residential development is $375,248 annually (in 2020 dollars).

Table 9: Estimated Total Annual Local Revenue Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 1

Direct Local Revenue from the Households		
Revenue Source	**Revenue per Household**	**Local Revenue**
Real Estate Tax	$1,121.78	$224,357
Personal Property Tax	$453.11	$90,621
Local Sales Tax	$201.95	$40,390
Meals Tax	$31.20	$6,241
Utility Tax	$68.19	$13,639
TOTAL Annual Local Revenue from Households		**$375,248**

Fiscal Costs

Table 10 details the additional annual local government services required to meet the needs of the new households in the development. This calculation is based on multiplying annual locally funded non-educational and educational local government services cost per household times the total number of housing units. Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the new households are $558,491 annually (in 2020 dollars).

Table 10: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 1

Local Government Services Expenditures for Households		
Expenditure Category	**Expenditure Per Household**	**Local Government Expenditure**
Educational Services	$1,020.74	$204,148
Other Local Services	$1,771.72	$354,343
TOTAL Local Government Services Expenditures for Households		**$558,491**

Net Fiscal Impact

Table 11 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 200 unit single family residential development on Region 1. As shown, that estimate is minus $183,243 annually.

Table 11: Estimated Net Local Fiscal Impact from a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 1

Annual Local Fiscal Benefit	$375,248
Annual Local Fiscal Cost	($558,491)
Net Annual Fiscal Impact	**($183,243)**

Hypothetical Manufacturing Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical manufacturing facility used in our analysis involves a capital investment of $12.9 million and directly employs 45 individuals.[38]
- The $12.9 million investment is evenly split between capital improvements (*e.g.*, building and other improvements) and capital equipment.[39]
- The hypothetical manufacturing facility would be sited on an approximately 50-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[40]
- The average real property tax rate is $0.523 per $100 of assessed value.[41]
- The average effective machinery and tools tax rate is $0.723 per $100 of assessed value.[42]
- The average median home value is $125,989.[43]
- Home ownership per employee is 0.69.[44]

[38] Based on Virginia Economic Development Partnership (VEDP) announcements over the ten year period from 2010 through 2019. Over that period there were 1,153 announcements for new and expanding manufacturing facilities recorded in the VEDP announcements data base in Virginia, at an average of $12.9 million in capital investment and 45 new jobs

[39] Based on general experience with proposed manufacturing facilities.

[40] Based on general experience with proposed manufacturing facilities.

[41] Based on an average of local real estate tax rates across the localities in the region.

[42] Based on an average of effective machinery and tools tax rates across the localities in the region (*i.e.*, the effective rate takes into account the depreciation schedule used in each locality and assumes that all equipment is at the mid-point of that depreciation schedule).

[43] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.

[44] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.43 per $100 of assessed value.[45]
- The average number of local residents per employee is 2.3.[46]
- Annual per employee local sales tax revenue is $195.60.[47]
- Annual per employee local meals tax revenue is $30.22.[48]
- Annual per employee local utility tax revenue is $66.05.[49]
- Annual per employee cost for locally funded educational services is $988.61.[50]
- Annual per employee cost for locally funded non-educational services is $1,715.96.[51]

Fiscal Benefits

Table 12 details the additional annual revenue that a hypothetical manufacturing facility would generate for its host locality. This calculation is based on the direct local tax revenue from the manufacturing facility itself and induced local tax revenue from the employees of the manufacturing facility.

- Direct local tax revenue from the manufacturing facility itself is calculated as: 1) the average real property tax rate, times the assumed investment in capital improvements, plus 2) the average regional property tax rate, times $11,000 per acre of assessed value, times 50 acres, plus 3) the average effective machinery and tools tax rate, times the assumed investment in capital equipment.
- Induced local tax revenue from the employees of the manufacturing facility is calculated as:

[45] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.
[46] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.
[47] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[48] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[49] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[50] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[51] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

- Real Estate Tax: the average median home price across localities in the region, times the average real estate tax rate across localities in the region, times the number of employees, times average home ownership rates across the region.
- Personal Property Tax: the assumed value of vehicles, times one vehicle per employee, times the average personal property tax rate for vehicles across the region.
- Local Sales, Meals, and Utility Taxes: the average per capita sales tax, meals tax, and utility tax revenue across localities in the region, times the average number of local residents per employee across localities in the region.

As shown in Table 12, based on these calculations we estimate that the total of direct local tax revenue from the hypothetical manufacturing facility and induced local tax revenue from the employees of the facility is $126,935 annually (in 2020 dollars).

Table 12: Estimated Total Annual Local Revenue Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 1

Direct Local Revenue from the Business		
Revenue Source		**Local Revenue**
Real Estate Tax from Land		$2,877
Real Estate Tax from Capital Improvements		$33,734
Machinery and Tools Tax		$46,621
Total Direct Local Revenue from Business		**$83,232**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**
Real Estate Tax	$457.71	$20,597
Personal Property Tax	$221.60	$9,972
Local Sales Tax	$195.60	$8,802
Meals Tax	$30.22	$1,360
Utility Tax	$66.05	$2,972
Total Induced Local Revenue from Employees		**$43,703**
TOTAL Annual Local Revenue		**$126,935**

Fiscal Costs

Table 13 details the additional annual local government services required to meet the needs of the employees of the hypothetical manufacturing facility. This calculation is based on multiplying annual locally funded non-educational and educational local government services cost per employee times the total number of employees. Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the hypothetical manufacturing facility are $121,706 annually (in 2020 dollars).

Table 13: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 1

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$988.61	$44,488
Other Local Services	$1,715.96	$77,218
TOTAL Induced Local Government Services Expenditures for Employees		**$121,706**

Net Fiscal Impact

Table 14 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical manufacturing facility on Region 1. As shown, that estimate is $5,229 annually.

Table 14: Estimated Net Local Fiscal Impact from a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 1

Annual Local Fiscal Benefit	$126,935
Annual Local Fiscal Cost	($121,706)
Net Annual Fiscal Impact	**$5,229**

Region 2: North-Central Virginia

We define Region 2 to include the counties of Caroline, Culpeper, Fauquier, Hanover, and Spotsylvania. In combination, 2,341 megawatts of interconnection requests were filed with PJM for utility scale solar projects in these localities between July 2015 and September 2019.

Hypothetical Solar Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical solar development used in our analysis is a 100 megawatt facility, with $134 million in total capital investment, and no direct employment.[52]
- The hypothetical solar development would be situated on an approximately 1,000-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[53]
- Average real property tax rates in the region are $0.820 per $100 of assessed value.[54]
- The State Corporation Commission's average 2019 assessment ratio for taxation of public utilities in the region is 0.8954.[55]
- The hypothetical solar development would have an expected operational life of 35 years.[56]

Fiscal Benefits

Tables 15 through 17 detail the additional annual revenue that the hypothetical solar facility would generate for its host locality over a 35-year period. These calculations are based on the same method used for Region 1 (*see* page 12).

80 Percent Exemption

As shown in Table 15a, we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the 80 percent exemption (for projects with an initial interconnection request before January 1, 2019) would be approximately $177,096 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $19,677 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $89,166 (in 2020 dollars).

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[52] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[53] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[54] Based on an average of existing county real estate tax rates within the region.

[55] Based on an average of State Corporation Commission's local 2019 utility assessment ratios for taxation of public utilities within the region.

[56] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

Table 15a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 2, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[57]	Depreciation[58]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[59]
1	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
2	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
3	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
4	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
5	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
6	$134,000,000	$23,996,720	87%	$20,877,146	$171,193
7	$134,000,000	$23,996,720	85%	$20,397,212	$167,257
8	$134,000,000	$23,996,720	82%	$19,677,310	$161,354
9	$134,000,000	$23,996,720	79%	$18,957,409	$155,451
10	$134,000,000	$23,996,720	76%	$18,237,507	$149,548
11	$134,000,000	$23,996,720	73%	$17,517,606	$143,644
12	$134,000,000	$23,996,720	69%	$16,557,737	$135,773
13	$134,000,000	$23,996,720	66%	$15,837,835	$129,870
14	$134,000,000	$23,996,720	62%	$14,877,966	$121,999
15	$134,000,000	$23,996,720	58%	$13,918,098	$114,128
16	$134,000,000	$23,996,720	53%	$12,718,262	$104,290
17	$134,000,000	$23,996,720	49%	$11,758,393	$96,419
18	$134,000,000	$23,996,720	44%	$10,558,557	$86,580
19	$134,000,000	$23,996,720	38%	$9,118,754	$74,774
20	$134,000,000	$23,996,720	33%	$7,918,918	$64,935
21	$134,000,000	$23,996,720	27%	$6,479,114	$53,129
22	$134,000,000	$23,996,720	21%	$5,039,311	$41,322
23	$134,000,000	$23,996,720	14%	$3,359,541	$27,548
24	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
25	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
26	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
27	$134,000,000	$23,996,720	10%	$2,399,672	$19,677

[57] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an 80 percent exemption from local taxes on capital equipment and improvements, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[58] Data Source: State Corporation Commission guidelines.

[59] 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 the assumed average real property tax rate of $0.820 per $100 of assessed value.

Table 15a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 2, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[57]	Depreciation[58]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[59]
28	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
29	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
30	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
31	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
32	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
33	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
34	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
35	$134,000,000	$23,996,720	10%	$2,399,672	$19,677
Cumulative Total					**$3,120,821**
Average Annual					**$89,166**

Stepdown Exemption

As shown in Table 15b, we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the stepdown exemption (for projects with an initial interconnection request on or after January 1, 2019) would be approximately $177,096 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $39,355 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $141,536 (in 2020 dollars).

Table 15b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 2, Stepdown Exemption

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[60]	Depreciation[61]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[62]
1	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
2	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
3	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
4	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
5	$134,000,000	$23,996,720	90%	$21,597,048	$177,096
6	$134,000,000	$35,995,080	87%	$31,315,720	$256,789
7	$134,000,000	$35,995,080	85%	$30,595,818	$250,886
8	$134,000,000	$35,995,080	82%	$29,515,966	$242,031
9	$134,000,000	$35,995,080	79%	$28,436,113	$233,176
10	$134,000,000	$35,995,080	76%	$27,356,261	$224,321
11	$134,000,000	$47,993,440	73%	$35,035,211	$287,289
12	$134,000,000	$47,993,440	69%	$33,115,474	$271,547
13	$134,000,000	$47,993,440	66%	$31,675,670	$259,740
14	$134,000,000	$47,993,440	62%	$29,755,933	$243,999
15	$134,000,000	$47,993,440	58%	$27,836,195	$228,257
16	$134,000,000	$47,993,440	53%	$25,436,523	$208,579
17	$134,000,000	$47,993,440	49%	$23,516,786	$192,838
18	$134,000,000	$47,993,440	44%	$21,117,114	$173,160
19	$134,000,000	$47,993,440	38%	$18,237,507	$149,548
20	$134,000,000	$47,993,440	33%	$15,837,835	$129,870
21	$134,000,000	$47,993,440	27%	$12,958,229	$106,257
22	$134,000,000	$47,993,440	21%	$10,078,622	$82,645
23	$134,000,000	$47,993,440	14%	$6,719,082	$55,096
24	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
25	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
26	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
27	$134,000,000	$47,993,440	10%	$4,799,344	$39,355

[60] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an exemption from local taxes on capital equipment and improvements (80 percent in years 1-5, 70 percent in years 6-10, and 60 percent in years 11+) if an initial interconnection request has been filed on or after January 1, 2019, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[61] Data Source: State Corporation Commission guidelines.

[62] 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 the assumed average real property tax rate of $0.523 per $100 of assessed value.

Table 15b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 2, Stepdown Exemption

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[60]	Depreciation[61]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[62]
28	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
29	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
30	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
31	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
32	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
33	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
34	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
35	$134,000,000	$47,993,440	10%	$4,799,344	$39,355
Cumulative Total					**$4,953,763**
Average Annual					**$141,536**

Revenue Share

Table 15c details the revenue generated from a revenue share agreement between the solar company and locality. Based on a total generation capacity of 100 MW AC and a revenue share of $1,400 per MW, the locality would receive a revenue of $140,000 per year over the anticipated 35-year operational life of the project (in 2020 dollars).

Table 15c: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years under a Revenue Share Agreement (2020 Dollars), Region 2

Estimated Total Generation Capacity (in MW AC)	100
Revenue Share per MW	$1,400
Annual County Revenue Share	**$140,000**
Cumulative Total	**$4,900,000**

Table 16 provides a similar calculation for the estimated annual local real estate tax revenue from the reassessed value of the land after rezoning. As these data indicate, based on an assumed 1,000 acre tract, a $11,000 per acre reassessed value after rezoning, and an average regional real property tax rate of $0.820 per $100 of assessed value, we estimate the annual local revenue from taxation of land alone would be $90,200 (in 2020 dollars) for all three scenarios (80 percent exemption, stepdown exemption and revenue share).

Table 16: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility from Reassessed Value of Land (2020 Dollars) – Region 2

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Estimated Increased Appraised Value of Property under Solar Use	$11,000,000	$11,000,000	$11,000,000
Average Regional Real Estate Tax Rate	0.00820	0.00820	0.00820
Annual Local Real Estate Tax Revenue	**$90,200**	**$90,200**	**$90,200**

Table 17 combines the annual local revenue estimates from Tables 15a-c and 16 to provide an estimate of total annual local revenue from a hypothetical 100 megawatt solar facility. As shown, we estimate that figure to be $179,366 per year on average for the 80 percent exemption scenario, $231,736 per year on average for the stepdown scenario, and $230,200 per year for the revenue share scenario over the anticipated 35-year life of the facility (in 2020 dollars).

Table 17: Estimated Total Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 2

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Average Annual Local Revenue from Taxation of Capital Investments / Revenue Share	$89,166	$141,536	$140,000
Annual Local Revenue from Taxation of Land	$90,200	$90,200	$90,200
TOTAL Average Annual Local Revenue	**$179,366**	**$231,736**	**$230,200**

Fiscal Costs

Because the hypothetical 100 megawatt solar facility is assumed to provide no direct employment, and based on our premise that fiscal costs are comprised of the local government services required to meet the needs of the number of employees or residents associated with a particular use, we estimate that the hypothetical solar facility would impose zero fiscal costs on its host locality.

Net Fiscal Impact

Table 18 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 100 megawatt solar facility on Region 2. As shown, that estimate is $179,366 annually for the 80 percent exemption scenario, $231,736 annually for the stepdown scenario and $230,200 for the revenue share scenario.

Table 18: Estimated Net Local Fiscal Impact from a Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 2

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Annual Local Fiscal Benefit	$179,366	$231,736	$230,200
Annual Local Fiscal Cost	$0	$0	$0
Net Annual Fiscal Impact	**$179,366**	**$231,736**	**$230,200**

Hypothetical Agricultural Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical agricultural enterprise used in our analysis encompasses the entire 1,000 acre site, generates $427.55 per acre in annual revenue, and directly employs 34 individuals.[63]
- The assessed value of the 1,000 acre site would be $951 per acre.[64]
- The average real property tax rate is $0.820 per $100 of assessed value.[65]
- The average median home value is $302,074.[66]
- Home ownership per employee is 0.55.[67]
- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.41 per $100 of assessed value.[68]
- The average number of local residents per employee is 2.0.[69]

[63] Data Sources: 1) the $427.55 in annual revenue per acre is an average of farm revenue per acre for localities within the region from the U.S. Department of Agriculture, 2017 Census of Agriculture, and 2) the direct employment of 34 workers is based on the $427.55 annual revenue estimate and derived using a region specific analysis from the IMPLAN economic impact simulation model.

[64] Based on an average of typical local assessments for agricultural land in the Land Use program and experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[65] Based on an average of local real estate tax rates across the localities in the region.

[66] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.

[67] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

[68] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[69] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

- Annual per employee local sales tax revenue is $282.72.[70]
- Annual per employee local meals tax revenue is $45.32.[71]
- Annual per employee local utility tax revenue is $42.30.[72]
- Annual per employee cost for locally funded non-educational services is $1,869.79.[73]
- Annual per employee cost for locally funded educational services is $1,715.75.[74]

Fiscal Benefits

Table 19 details the additional annual revenue that a hypothetical agricultural enterprise would generate for its host locality. This calculation is based on the direct local tax revenue from the agricultural enterprise itself and induced local tax revenue from the employees of the agricultural enterprise and is derived using the same method employed for Region 1 (*see* page 20). Based on these calculations we estimate that the total of direct local tax revenue from the agricultural enterprise and induced local tax revenue from the employees of the enterprise is $74,449 annually (in 2020 dollars).

Table 19: Estimated Total Annual Local Revenue Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 2

Direct Local Revenue from the Business		
Revenue Source	**Total Assessed Value**	**Local Revenue**
Real Estate Tax	$951,000	$7,800
Total Direct Local Revenue from Business		**$7,800**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**

[70] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[71] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[72] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[73] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[74] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

Real Estate Tax	$1,369.23	$46,554
Personal Property Tax	$220.70	$7,504
Local Sales Tax	$282.72	$9,612
Meals Tax	$45.32	$1,541
Utility Tax	$42.30	$1,438
Total Induced Local Revenue from Employees		**$66,649**
TOTAL Annual Local Revenue		**$74,449**

Fiscal Costs

Table 20 details the additional annual local government services required to meet the needs of the employees of the agricultural enterprise. This calculation is based on the same method employed for Region 1 (*see* page 21). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the agricultural enterprise are $121,908 annually (in 2020 dollars)

Table 20: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 2

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$1,715.75	$58,335
Other Local Services	$1,869.79	$63,573
TOTAL Induced Local Government Services Expenditures for Employees		**$121,908**

Net Fiscal Impact

Table 21 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 1,000 acre agricultural enterprise on Region 2. As shown, that estimate is minus $47,459 annually.

Table 21: Estimated Net Local Fiscal Impact from a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 2

Annual Local Fiscal Benefit	$74,449
Annual Local Fiscal Cost	($121,908)
Net Annual Fiscal Impact	**($47,459)**

Hypothetical Residential Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical residential development used in our analysis encompasses 200 new single family units with an average assessed value of $286,892.[75]
- The average real property tax rate is $0.820 per $100 of assessed value.[76]
- Average residents per household in the region is 2.79.[77]
- New residents of the development would represent a net increase in population to the host community as they would either be new residents, or existing residents whose previous residences would be rented/sold to someone else.
- Average vehicles per household in the region is 2.24.[78]
- The average assessed vehicle value is $5,000 and the personal property tax rate applied to that personal property is $4.41 per $100 of assessed value.[79]
- Annual per household local sales tax revenue is $384.42.[80]

[75] Based on an average new construction single family building permit value in the region, U.S. Census Bureau, 2018 Building Permits Survey.

[76] Based on an average of local real estate tax rates across the localities in the region.

[77] Based on an average household size in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.

[78] Based on an average vehicles per household in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.

[79] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[80] Based on an average of 2017 per capita local sales tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.

- Annual per household local meals tax revenue is $61.62.[81]
- Annual per household local utility tax revenue is $57.52.[82]
- Annual per household cost for locally funded non-educational services is $2,542.40.[83]
- Annual per household cost for locally funded educational services is $2,332.95.[84]

Fiscal Benefits

Table 22 details the additional annual revenue that a hypothetical residential development would generate for its host locality. This calculation is based on the direct local tax revenue from the households located in the development and is derived using the same method employed for Region 1 (*see* page 23). Based on these calculations we estimate that the total direct local tax revenue from the households of the residential development is $670,104 annually (in 2020 dollars).

Table 22: Estimated Total Annual Local Revenue Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 2

Direct Local Revenue from the Households		
Revenue Source	**Revenue per Household**	**Local Revenue**
Real Estate Tax	$2,353.32	$470,663
Personal Property Tax	$493.66	$98,732
Local Sales Tax	$384.42	$76,883
Meals Tax	$61.62	$12,323
Utility Tax	$57.52	$11,503
TOTAL Annual Local Revenue from Households		**$670,104**

Fiscal Costs

Table 23 details the additional annual local government services required to meet the needs of the new households in the development. This calculation is based on the same method employed for Region 1 (*see* page 24). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the new households are $975,070 annually (in 2020 dollars).

[81] Based on an average of 2017 per capita meals tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[82] Based on an average of 2017 per capita utility tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[83] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[84] Based on an average of 2017 per capita expenditures for locally-funded educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.

Table 23: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 2

Local Government Services Expenditures for Households		
Expenditure Category	**Expenditure Per Household**	**Local Government Expenditure**
Educational Services	$2,332.95	$466,590
Other Local Services	$2,542.40	$508,481
TOTAL Local Government Services Expenditures for Households		**$975,070**

Net Fiscal Impact

Table 24 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 200 unit single family residential development on Region 2. As shown, that estimate is minus $304,966 annually.

Table 24: Estimated Net Local Fiscal Impact from a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 2

Annual Local Fiscal Benefit	$670,104
Annual Local Fiscal Cost	($975,070)
Net Annual Fiscal Impact	**($304,966)**

Hypothetical Manufacturing Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical manufacturing facility used in our analysis involves a capital investment of $12.9 million and directly employs 45 individuals.[85]
- The $12.9 million investment is evenly split between capital improvements (*e.g.*, building and other improvements) and capital equipment.[86]

[85] Based on Virginia Economic Development Partnership (VEDP) announcements over the ten year period from 2010 through 2019. Over that period there were 1,153 announcements for new and expanding manufacturing facilities recorded in the VEDP announcements data base in Virginia, at an average of $12.9 million in capital investment and 45 new jobs

[86] Based on general experience with proposed manufacturing facilities.

- The hypothetical manufacturing facility would be sited on an approximately 50-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[87]
- The average real property tax rate is $0.820 per $100 of assessed value.[88]
- The average effective machinery and tools tax rate is $0.809 per $100 of assessed value.[89]
- The average median home value is $302,074.[90]
- Home ownership per employee is 0.55.[91]
- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.41 per $100 of assessed value.[92]
- The average number of local residents per employee is 2.0.[93]
- Annual per employee local sales tax revenue is $282.72.[94]
- Annual per employee local meals tax revenue is $45.32.[95]
- Annual per employee local utility tax revenue is $42.30.[96]
- Annual per employee cost for locally funded non-educational services is $1,869.79.[97]

[87] Based on general experience with proposed manufacturing facilities.
[88] Based on an average of local real estate tax rates across the localities in the region.
[89] Based on an average of effective machinery and tools tax rates across the localities in the region (*i.e.*, the effective rate takes into account the depreciation schedule used in each locality and assumes that all equipment is at the mid-point of that depreciation schedule).
[90] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.
[91] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.
[92] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.
[93] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.
[94] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[95] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[96] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.
[97] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

- Annual per employee cost for locally funded educational services is $1,715.75.[98]

Fiscal Benefits

Table 25 details the additional annual revenue that a hypothetical manufacturing facility would generate for its host locality. This calculation is based on the direct local tax revenue from the manufacturing facility itself and induced local tax revenue from the employees of the manufacturing facility and is derived using the same method employed for Region 1 (*see* pages 26-27). Based on these calculations we estimate that the total of direct local tax revenue from the manufacturing facility and induced local tax revenue from the employees of the manufacturing facility is $197,837 annually (in 2020 dollars).

Table 25: Estimated Total Annual Local Revenue Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 2

Direct Local Revenue from the Business		
Revenue Source		**Local Revenue**
Real Estate Tax from Land		$4,512
Real Estate Tax from Capital Improvements		$52,908
Machinery and Tools Tax		$52,206
Total Direct Local Revenue from Business		**$109,626**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**
Real Estate Tax	$1,369.23	$61,615
Personal Property Tax	$220.70	$9,932
Local Sales Tax	$282.72	$12,722
Meals Tax	$45.32	$2,039
Utility Tax	$42.30	$1,903
Total Induced Local Revenue from Employees		**$88,211**
TOTAL Annual Local Revenue		**$197,837**

[98] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

Fiscal Costs

Table 26 details the additional annual local government services required to meet the needs of the employees of the hypothetical manufacturing facility. This calculation is based on multiplying annual locally funded non-educational and educational local government services cost per employee times the total number of employees and is derived using the same method employed for Region 1 (*see* page 28). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the hypothetical manufacturing facility are $161,349 annually (in 2020 dollars).

Table 26: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 2

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$1,715.75	$77,209
Other Local Services	$1,869.79	$84,140
TOTAL Induced Local Government Services Expenditures for Employees		**$161,349**

Net Fiscal Impact

Table 27 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical manufacturing facility on Region 2. As shown, that estimate is $36,488 annually.

Table 27: Estimated Net Local Fiscal Impact from a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 2

Annual Local Fiscal Benefit	$197,837
Annual Local Fiscal Cost	($161,349)
Net Annual Fiscal Impact	**$36,488**

Region 3: Southeastern Virginia

We define Region 3 to include the counties of Greensville, Isle of Wight, Southampton, Surry, and Sussex, and the city of Chesapeake. In combination, 4,049 megawatts of interconnection requests were filed with PJM for utility scale solar projects in these localities between July 2015 and September 2019.

Hypothetical Solar Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical solar development used in our analysis is a 100 megawatt facility, with $134 million in total capital investment, and no direct employment.[99]
- The hypothetical solar development would be situated on an approximately 1,000-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[100]
- Average real property tax rates in the region are $0.793 per $100 of assessed value.[101]
- The State Corporation Commission's average 2019 assessment ratio for taxation of public utilities in the region is 0.9448.[102]
- The hypothetical solar development would have an expected operational life of 35 years.[103]

Fiscal Benefits

Tables 28 through 30 detail the additional annual revenue that the hypothetical solar facility would generate for its host locality over a 35-year period. These calculations are based on the same approach used for Region 1 (*see* page 12).

As shown in Table 28a, we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the 80 percent exemption (for projects with an initial interconnection request before January 1, 2019) would be approximately $180,720 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $20,080 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $90,991 (in 2020 dollars).

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[99] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[100] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[101] Based on an average of existing county real estate tax rates within the region.

[102] Based on an average of State Corporation Commission's local 2019 utility assessment ratios for taxation of public utilities within the region.

[103] Based on experience with nearly two dozen proposed utility scale solar facilities in Virginia.

Table 28a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 3, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[104]	Depreciation[105]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[106]
1	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
2	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
3	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
4	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
5	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
6	$134,000,000	$25,321,533	87%	$22,029,734	$174,696
7	$134,000,000	$25,321,533	85%	$21,523,303	$170,680
8	$134,000,000	$25,321,533	82%	$20,763,657	$164,656
9	$134,000,000	$25,321,533	79%	$20,004,011	$158,632
10	$134,000,000	$25,321,533	76%	$19,244,365	$152,608
11	$134,000,000	$25,321,533	73%	$18,484,719	$146,584
12	$134,000,000	$25,321,533	69%	$17,471,858	$138,552
13	$134,000,000	$25,321,533	66%	$16,712,212	$132,528
14	$134,000,000	$25,321,533	62%	$15,699,351	$124,496
15	$134,000,000	$25,321,533	58%	$14,686,489	$116,464
16	$134,000,000	$25,321,533	53%	$13,420,413	$106,424
17	$134,000,000	$25,321,533	49%	$12,407,551	$98,392
18	$134,000,000	$25,321,533	44%	$11,141,475	$88,352
19	$134,000,000	$25,321,533	38%	$9,622,183	$76,304
20	$134,000,000	$25,321,533	33%	$8,356,106	$66,264
21	$134,000,000	$25,321,533	27%	$6,836,814	$54,216
22	$134,000,000	$25,321,533	21%	$5,317,522	$42,168
23	$134,000,000	$25,321,533	14%	$3,545,015	$28,112
24	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
25	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
26	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
27	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
28	$134,000,000	$25,321,533	10%	$2,532,153	$20,080

[104] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an 80 percent exemption from local taxes on capital equipment and improvements, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[105] Data Source: State Corporation Commission guidelines.

[106] 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 the assumed average real property tax rate of $0.793 per $100 of assessed value.

Table 28a: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 3, 80 Percent Exemption

Year	Total Capital Investment subject to 80% Exemption	Less Exemption and SCC Utility Assessment Ratio[104]	Depreciation[105]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[106]
29	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
30	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
31	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
32	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
33	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
34	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
35	$134,000,000	$25,321,533	10%	$2,532,153	$20,080
Cumulative Total					**$3,184,684**
Average Annual					**$90,991**

Stepdown Exemption

As shown in Table 28b, we estimate that the local revenue from taxation of capital investments associated with the hypothetical solar facility under the stepdown exemption (for projects with an initial interconnection request on or after January 1, 2019) would be approximately $180,720 in the solar facility's first year of operation, with that figure projected to gradually decline to approximately $40,160 in the facility's 35th year of operation, as the value of the proposed capital investments is depreciated. Over the period as a whole, the average annual local revenue from taxation of capital investments alone would be $144,432 (in 2020 dollars).

Table 28b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 3, Stepdown

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[107]	Depreciation[108]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[109]
1	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
2	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
3	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
4	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
5	$134,000,000	$25,321,533	90%	$22,789,380	$180,720
6	$134,000,000	$37,982,300	87%	$33,044,601	$262,044
7	$134,000,000	$37,982,300	85%	$32,284,955	$256,020
8	$134,000,000	$37,982,300	82%	$31,145,486	$246,984
9	$134,000,000	$37,982,300	79%	$30,006,017	$237,948
10	$134,000,000	$37,982,300	76%	$28,866,548	$228,912
11	$134,000,000	$50,643,067	73%	$36,969,439	$293,168
12	$134,000,000	$50,643,067	69%	$34,943,716	$277,104
13	$134,000,000	$50,643,067	66%	$33,424,424	$265,056
14	$134,000,000	$50,643,067	62%	$31,398,701	$248,992
15	$134,000,000	$50,643,067	58%	$29,372,979	$232,928
16	$134,000,000	$50,643,067	53%	$26,840,825	$212,848
17	$134,000,000	$50,643,067	49%	$24,815,103	$196,784
18	$134,000,000	$50,643,067	44%	$22,282,949	$176,704
19	$134,000,000	$50,643,067	38%	$19,244,365	$152,608
20	$134,000,000	$50,643,067	33%	$16,712,212	$132,528
21	$134,000,000	$50,643,067	27%	$13,673,628	$108,432
22	$134,000,000	$50,643,067	21%	$10,635,044	$84,336
23	$134,000,000	$50,643,067	14%	$7,090,029	$56,224
24	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
25	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
26	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
27	$134,000,000	$50,643,067	10%	$5,064,307	$40,160

[107] Calculated pursuant to Virginia Code § 58.1-3660 which stipulates that solar facilities over 5 megawatts and under 150 megawatts are subject to an exemption from local taxes on capital equipment and improvements (80 percent in years 1-5, 70 percent in years 6-10, and 60 percent in years 11+) if an initial interconnection request has been filed on or after January 1, 2019, and the State Corporation Commission's published 2019 assessment ratio for taxation of public utilities.

[108] Data Source: State Corporation Commission guidelines.

[109] 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 the assumed average real property tax rate of $0.523 per $100 of assessed value.

Table 28b: Estimated Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years from Capital Investment (2020 Dollars) – Region 3, Stepdown

Year	Total Capital Investment subject to Stepdown Exemption	Less Exemption and SCC Utility Assessment Ratio[107]	Depreciation[108]	Depreciated Value of Taxable Capital Investment	Additional Annual Local Tax Revenue Solar Investment[109]
28	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
29	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
30	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
31	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
32	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
33	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
34	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
35	$134,000,000	$50,643,067	10%	$5,064,307	$40,160
Cumulative Total					**$5,055,134**
Average Annual					**$144,432**

Revenue Share

Table 28c details the revenue generated from a revenue share agreement between the solar company and locality. Based on a total generation capacity of 100 MW AC and a revenue share of $1,400 per MW, the locality would receive a revenue of $140,000 per year over the anticipated 35-year operational life of the project (in 2020 dollars).

Table 28c: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility over 35-Years under a Revenue Share Agreement (2020 Dollars), Region 3

Estimated Total Generation Capacity (in MW AC)	100
Revenue Share per MW	$1,400
Annual County Revenue Share	**$140,000**
Cumulative Total	**$4,900,000**

Table 29 provides a similar calculation for the estimated annual local real estate tax revenue from the reassessed value of the land after rezoning. As these data indicate, based on an assumed 1,000 acre tract, a $11,000 per acre reassessed value after rezoning, and an average regional real property tax rate of $0.793 per $100 of assessed value, we estimate the annual local revenue from taxation of land alone would be $87,230 (in 2020 dollars) for all three scenarios (80 percent exemption, stepdown exemption and revenue share).

Table 29: Estimated Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility from Reassessed Value of Land (2020 Dollars) – Region 3

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Estimated Increased Appraised Value of Property under Solar Use	$11,000,000	$11,000,000	$11,000,000
Average Regional Real Estate Tax Rate	0.00793	0.00793	0.00793
Annual Local Real Estate Tax Revenue	**$87,230**	**$87,230**	**$87,230**

Table 30 combines the annual local revenue estimates from Tables 28a-c and 29 to provide an estimate of total annual local revenue from a hypothetical 100 megawatt solar facility. As shown, we estimate that figure to be $178,221 per year on average for the 80 percent exemption scenario, $231,662 per year on average for the stepdown scenario, and $227,230 per year for the revenue share scenario over the anticipated 35-year life of the facility (in 2020 dollars).

Table 30: Estimated Total Average Annual Local Revenue Generated by Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 3

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Average Annual Local Revenue from Taxation of Capital Investments / Revenue Share	$90,991	$144,432	$140,000
Annual Local Revenue from Taxation of Land	$87,230	$87,230	$87,230
TOTAL Average Annual Local Revenue	**$178,221**	**$231,662**	**$227,230**

Fiscal Costs

Because the hypothetical 100 megawatt solar facility is assumed to provide no direct employment, and based on our premise that fiscal costs are comprised of the local government services required to meet the needs of the number of employees or residents associated with a particular use, we estimate that the hypothetical solar facility would impose zero fiscal costs on its host locality.

Net Fiscal Impact

Table 31 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 100 megawatt solar facility on Region 3. As shown, that estimate is $178,221 annually for the 80 percent exemption scenario, $231,662 annually for the stepdown scenario and $227,230 for the revenue share scenario.

Table 31: Estimated Net Local Fiscal Impact from a Hypothetical 100 Megawatt Solar Facility (2020 Dollars) – Region 3

	80 Percent Exemption	Stepdown Exemption	Revenue Share
Annual Local Fiscal Benefit	$178,221	$231,662	$227,230
Annual Local Fiscal Cost	$0	$0	$0
Net Annual Fiscal Impact	**$178,221**	**$231,662**	**$227,230**

Hypothetical Agricultural Use

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical agricultural enterprise used in our analysis encompasses the entire 1,000 acre site, generates $677.54 per acre in annual revenue, and directly employs 13 individuals.[110]
- The assessed value of the 1,000 acre site would be $1,567 per acre.[111]
- The average real property tax rate is $0.793 per $100 of assessed value.[112]
- The average median home value is $186,095.[113]
- Home ownership per employee is 0.59.[114]
- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.57 per $100 of assessed value.[115]
- The average number of local residents per employee is 2.3.[116]

[110] Data Sources: 1) the $677.54 in annual revenue per acre is an average of farm revenue per acre for localities within the region from the U.S. Department of Agriculture, 2017 Census of Agriculture, and 2) the direct employment of 13 workers is based on the $677.54 annual revenue estimate and derived using a region specific analysis from the IMPLAN economic impact simulation model.

[111] Based on an average of typical local assessments for agricultural land in the Land Use program and experience with nearly two dozen proposed utility scale solar facilities in Virginia.

[112] Based on an average of local real estate tax rates across the localities in the region.

[113] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.

[114] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

[115] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[116] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

- Annual per employee local sales tax revenue is $210.49.[117]
- Annual per employee local meals tax revenue is $62.71.[118]
- Annual per employee local utility tax revenue is $52.19.[119]
- Annual per employee cost for locally funded non-educational services is $2,316.70.[120]
- Annual per employee cost for locally funded educational services is $1,965.59.[121]

Fiscal Benefits

Table 32 details the additional annual revenue that a hypothetical agricultural enterprise would generate for its host locality. This calculation is based on the direct local tax revenue from the agricultural enterprise itself and induced local tax revenue from the employees of the agricultural enterprise and is derived using the same method employed for Region 1 (*see* page 20). Based on these calculations we estimate that the total of direct local tax revenue from the agricultural enterprise and induced local tax revenue from the employees of the enterprise is $30,998 annually (in 2020 dollars).

[117] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[118] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[119] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[120] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[121] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

Table 32: Estimated Total Annual Local Revenue Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 3

Direct Local Revenue from the Business		
Revenue Source	**Total Assessed Value**	**Local Revenue**
Real Estate Tax	$1,567,000	$12,422
Total Direct Local Revenue from Business		**$12,422**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**
Real Estate Tax	$874.97	$11,375
Personal Property Tax	$228.58	$2,972
Local Sales Tax	$210.49	$2,736
Meals Tax	$62.71	$815
Utility Tax	$52.19	$678
Total Induced Local Revenue from Employees		**$18,576**
TOTAL Annual Local Revenue		**$30,998**

Fiscal Costs

Table 33 details the additional annual local government services required to meet the needs of the employees of the agricultural enterprise. This calculation is based on the same method employed for Region 1 (*see* page 21). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the agricultural enterprise are $55,670 annually (in 2020 dollars).

Table 33: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 3

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$1,965.59	$25,553
Other Local Services	$2,316.70	$30,117
TOTAL Induced Local Government Services Expenditures for Employees		**$55,670**

Net Fiscal Impact

Table 34 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 1,000 acre agricultural enterprise on Region 3. As shown, that estimate is minus $24,672 annually.

Table 34: Estimated Net Local Fiscal Impact from a Hypothetical 1,000 Acre Agricultural Enterprise (2020 Dollars) – Region 3

Annual Local Fiscal Benefit	$30,998
Annual Local Fiscal Cost	($55,670)
Net Annual Fiscal Impact	**($24,672)**

Hypothetical Residential Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical residential development used in our analysis encompasses 200 new single family units with an average assessed value of $194,879.[122]
- The average real property tax rate is $0.793 per $100 of assessed value.[123]
- Average residents per household in the region is 2.43.[124]
- New residents of the development would represent a net increase in population to the host community as they would either be new residents, or existing residents whose previous residences would be rented/sold to someone else.
- Average vehicles per household in the region is 2.11.[125]
- The average assessed vehicle value is $5,000 and the personal property tax rate applied to that personal property is $4.57 per $100 of assessed value.[126]
- Annual per household local sales tax revenue is $218.25.[127]

[122] Based on an average new construction single family building permit value in the region, U.S. Census Bureau, 2018 Building Permits Survey.

[123] Based on an average of local real estate tax rates across the localities in the region.

[124] Based on an average household size in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.

[125] Based on an average vehicles per household in the region from the U.S. Census Bureau, 2013-2017 American Community Survey.

[126] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[127] Based on an average of 2017 per capita local sales tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.

- Annual per household local meals tax revenue is $65.02.[128]
- Annual per household local utility tax revenue is $54.11.[129]
- Annual per household cost for locally funded non-educational services is $2,402.06.[130]
- Annual per household cost for locally funded educational services is $2,038.01[131]

Fiscal Benefits

Table 35 details the additional annual revenue that a hypothetical residential development would generate for its host locality. This calculation is based on the direct local tax revenue from the households located in the development and is derived using the same method employed for Region 1 (*see* page 23). Based on these calculations we estimate that the total direct local tax revenue from the households of the residential development is $472,631 annually (in 2020 dollars).

Table 35: Estimated Total Annual Local Revenue Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 3

Direct Local Revenue from the Households		
Revenue Source	**Revenue per Household**	**Local Revenue**
Real Estate Tax	$1,544.41	$308,883
Personal Property Tax	$481.36	$96,272
Local Sales Tax	$218.25	$43,650
Meals Tax	$65.02	$13,004
Utility Tax	$54.11	$10,822
TOTAL Annual Local Revenue from Households		**$472,631**

Fiscal Costs

Table 36 details the additional annual local government services required to meet the needs of the new households in the development. This calculation is based on the same method employed for Region 1

[128] Based on an average of 2017 per capita meals tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[129] Based on an average of 2017 per capita utility tax revenue times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[130] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.
[131] Based on an average of 2017 per capita expenditures for locally-funded educational services times average household size across the localities in the region as derived from data from the Virginia Auditor of Public Accounts and U.S. Census Bureau.

(see page 24). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the new households are $888,016 annually (in 2020 dollars).

Table 36: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 3

Local Government Services Expenditures for Households		
Expenditure Category	**Expenditure Per Household**	**Local Government Expenditure**
Educational Services	$2,038.01	$407,603
Other Local Services	$2,402.06	$480,413
TOTAL Local Government Services Expenditures for Households		**$888,016**

Net Fiscal Impact

Table 37 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical 200 unit single family residential development on Region 3. As shown, that estimate is minus $415,385 annually.

Table 37: Estimated Net Local Fiscal Impact from a Hypothetical 200 Unit Single Family Residential Development (2020 Dollars) – Region 3

Annual Local Fiscal Benefit	$472,631
Annual Local Fiscal Cost	($888,016)
Net Annual Fiscal Impact	**($415,385)**

Hypothetical Manufacturing Development

Assumptions

In conducting our analysis, we employ the following assumptions:

- The hypothetical manufacturing facility used in our analysis involves a capital investment of $12.9 million and directly employs 45 individuals.[132]
- The $12.9 million investment is evenly split between capital improvements (*e.g.*, building and other improvements) and capital equipment.[133]

[132] Based on Virginia Economic Development Partnership (VEDP) announcements over the ten year period from 2010 through 2019. Over that period there were 1,153 announcements for new and expanding manufacturing facilities recorded in the VEDP announcements data base in Virginia, at an average of $12.9 million in capital investment and 45 new jobs

[133] Based on general experience with proposed manufacturing facilities.

- The hypothetical manufacturing facility would be sited on an approximately 50-acre tract of land, the tract would be rezoned as industrial, and the assessed value of the land would increase to $11,000 per acre.[134]
- The average real property tax rate is $0.793 per $100 of assessed value.[135]
- The average effective machinery and tools tax rate is $0.947 per $100 of assessed value.[136]
- The average median home value is $186,095.[137]
- Home ownership per employee is 0.59.[138]
- Each employee owns one vehicle with an average assessed value of $5,000 and the personal property tax rate applied to that personal property is $4.57 per $100 of assessed value.[139]
- The average number of local residents per employee is 2.3.[140]
- Annual per employee local sales tax revenue is $210.49.[141]
- Annual per employee local meals tax revenue is $62.71.[142]
- Annual per employee local utility tax revenue is $52.19.[143]
- Annual per employee cost for locally funded educational services is $1,965.59.[144]

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[134] Based on general experience with proposed manufacturing facilities.

[135] Based on an average of local real estate tax rates across the localities in the region.

[136] Based on an average of effective machinery and tools tax rates across the localities in the region (*i.e.*, the effective rate takes into account the depreciation schedule used in each locality and assumes that all equipment is at the mid-point of that depreciation schedule).

[137] Based on an average of median home value estimates across the localities in the region from the National Association of Realtors.

[138] Based on an average of 2017 owner occupied homes divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

[139] Based on general experience with median assessed value of privately owned vehicles across Virginia localities, and an average of local personal property tax rates for vehicles across the localities in the region.

[140] Based on the ratio of 2017 total population divided by 2017 total employment across the localities in the region as derived from data from the U.S. Census Bureau and U.S. Bureau of Labor Statistics.

[141] Based on an average of 2017 per capita local sales tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[142] Based on an average of 2017 per capita meals tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[143] Based on an average of 2017 per capita utility tax revenue times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

[144] Based on an average of 2017 per capita expenditures for locally-funded educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

- Annual per employee cost for locally funded non-educational services is $2,316.70.[145]

Fiscal Benefits

Table 38 details the additional annual revenue that a hypothetical manufacturing facility would generate for its host locality. This calculation is based on the direct local tax revenue from the manufacturing facility itself and induced local tax revenue from the employees of the manufacturing facility and is derived using the same method employed for Region 1 (*see* pages 26-27). Based on these calculations we estimate that the total of direct local tax revenue from the manufacturing facility and induced local tax revenue from the employees of the manufacturing facility is $180,880 annually (in 2020 dollars).

Table 38: Estimated Total Annual Local Revenue Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 3

Direct Local Revenue from the Business		
Revenue Source		**Local Revenue**
Real Estate Tax from Land		$4,359
Real Estate Tax from Capital Improvements		$51,116
Machinery and Tools Tax		$61,103
Total Direct Local Revenue from Business		**$116,578**
Induced Local Revenue from Employees		
Revenue Source	**Revenue Per Employee**	**Local Revenue**
Real Estate Tax	$874.97	$39,374
Personal Property Tax	$228.58	$10,286
Local Sales Tax	$210.49	$9,472
Meals Tax	$62.71	$2,822
Utility Tax	$52.19	$2,348
Total Induced Local Revenue from Employees		**$64,302**
TOTAL Annual Local Revenue		**$180,880**

[145] Based on an average of 2017 per capita expenditures for locally-funded non-educational services times average local residents per employee across the localities in the region as derived from data from the Virginia Auditor of Public Accounts, U.S. Census Bureau, and U.S. Bureau of Labor Statistics.

Fiscal Costs

Table 39 details the additional annual local government services required to meet the needs of the employees of the hypothetical manufacturing facility. This calculation is based on multiplying annual locally funded non-educational and educational local government services cost per employee times the total number of employees and is derived using the same method employed for Region 1 (*see* page 28). Based on these calculations we estimate that the total annual local government services costs required to meet the needs of the employees of the hypothetical manufacturing facility are $192,702 annually (in 2020 dollars).

Table 39: Estimated Total Annual Local Government Service Expenditures Generated by a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 3

Induced Local Government Services Expenditures for Employees		
Expenditure Category	**Expenditure Per Employee**	**Local Government Expenditure**
Educational Services	$2,316.70	$104,251
Other Local Services	$1,965.59	$88,451
TOTAL Induced Local Government Services Expenditures for Employees		**$192,702**

Net Fiscal Impact

Table 40 combines the annual fiscal benefit and fiscal cost estimates derived above to provide an estimate of net fiscal impact from a hypothetical manufacturing facility on Region 3. As shown, that estimate is minus $11,822 annually.

Table 40: Estimated Net Local Fiscal Impact from a Hypothetical $12.9 million Manufacturing Facility (2020 Dollars) – Region 3

Annual Local Fiscal Benefit	$180,880
Annual Local Fiscal Cost	($192,702)
Net Annual Fiscal Impact	**($11,822)**