RE-EVALUATING THE LAND USE IMPACTS OF UTILITY-SCALE SOLAR ENERGY DEVELOPMENT IN VIRGINIA

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Table of Contents

Executive Summary

Virginia is one of the nation's leading producers of utility-scale solar energy. The state's first utility-scale solar facilities – defined here as solar photovoltaic (PV) systems with a power generation capacity of 5 megawatts (MW) alternating current (AC) or greater – went into operation in December 2016. Virginia now has 94 such facilities, as of June 2024. With a total capacity of over 4,000 MW (AC), Virginia is among the top 10 U.S. states in utility-scale solar capacity, in terms of both total MW and population-adjusted MW per-capita. Hundreds more facilities, totaling thousands of MW of capacity, are in various stages of planning, development, or construction. This rapid growth is likely to continue for some time, as utility-scale solar is now the least expensive form of new electricity supply in the United States. Furthermore, the Virginia Clean Economy Act calls for the state's two primary electric utilities to reach a 100% renewable energy standard over the next 20-25 years, and declares up to 16,100 MW of utility-scale solar to be "in the public interest."

To research the impacts of this technology, we have built a Geographic Information Systems (GIS) database of all utility-scale solar facilities currently operating in the state, and overlaid those project footprints with the Virginia Land Cover Dataset to identify the previous land uses at those locations. Importantly, unlike other studies that use acreage totals from these facilities' state and/or local-level permitting documents, we use aerial imagery to identify the "disturbed acreage" of each facility, i.e., the land area that has actually been converted from its previous state into solar development. This approach provides a much more accurate understanding of the rate at which land is being consumed by utility-scale solar, in terms of acres per MW, and the types of lands that are being displaced.

In addition to identifying the degree to which utility-scale solar development is displacing farmland, forest land, and other types of land cover, this report also uses data from the Virginia Department of Conservation and Recreation and the Virginia Department of Forestry to determine the "quality" of the land that is being affected, in terms of agricultural suitability and forest conservation value. Our high-level findings are as follows:

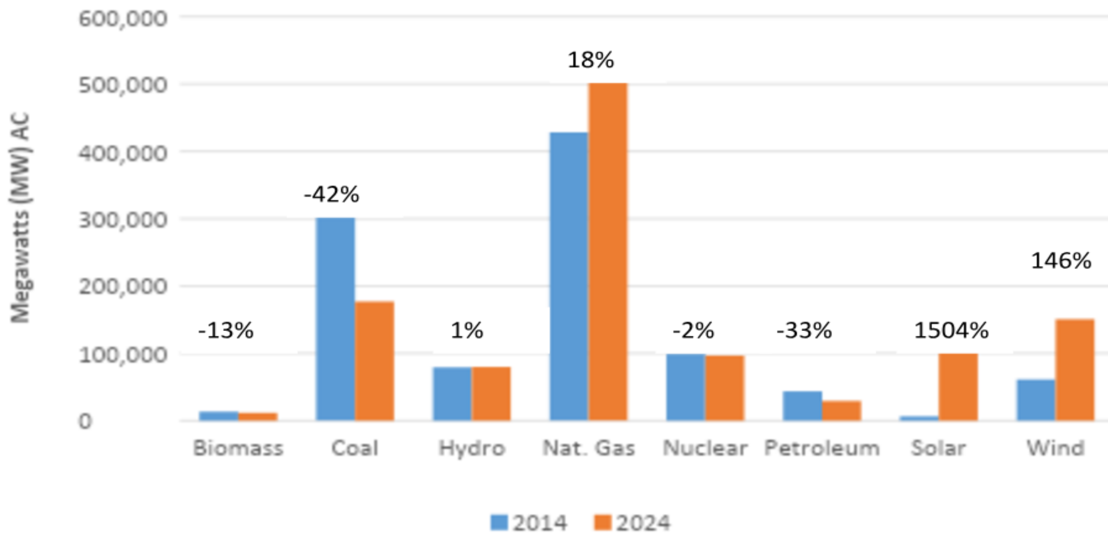
- The impacted land area of utility-scale solar facilities in Virginia averages 6.93 acres per MW (AC).
- The vast majority of utility-scale solar is placed on former forest (50%) and cropland (28%) land cover classifications.
- In aggregate, the impacts of utility-scale solar on the best natural resources in Virginia is heavily influenced by a small number of solar facilities.

This research is presented with the goal of updating past findings and providing a more detailed understanding of the land-use impacts of utility-scale solar in Virginia, in order to inform state and local-level policy approaches.

1. Status of Utility-Scale Solar in Virginia

According to the U.S. Energy Information Administration (EIA) Electric Power Monthly data, the United States' total net summer capacity for utility-scale solar photovoltaic (PV) electricity generation grew from 6,348 megawatts (MW) in July 2014, to 103,290 MW in July 2024.[1] [All electric power metrics in this report are shown in alternating current (AC) capacity, unless otherwise noted]. This 1504% change over the course of that decade makes utility-scale solar by far the fastest growing source of electric power generation in the country, as shown in Figure 1 below.

Figure 1. Growth of Utility-Scale Electricity Generation Capacity in United States (2014-2024)



Sources: U.S. Energy Information Administration (2024, 2014). Electric Power Monthly tables 6.02.A, 6.02.B, and 6.02.C. Reports from September 2024 and September 2014. https://www.eia.gov/electricity/monthly/.

The numbers shown in Figure 1 indicate that solar represents nearly 10% of the nation's total of 1.06 million MW of electric generation capacity. However, this does not mean that solar represents the same amount of total electricity production, as the different generation technologies have different capacity factors. Given that solar and wind rely on intermittent, non-dispatchable sources of energy input, they produce at their full capacity a much smaller percentage of the time, compared to conventional sources such as natural gas, coal, and nuclear power. As a result, solar accounted for only 3.9% of all utility-scale generation in the United States, as of 2023.

In Virginia, utility-scale solar has grown from 0 MW in late 2016 to 3,928 MW as of July, 2024, per the U.S. Energy Information Administration (EIA) Electric Power Monthly data. [*Note that our findings in this analysis include a larger total MW capacity, as not all electric generators report to the EIA on a monthly basis*]. Virginia's total utility-scale solar capacity currently ranks seventh among all U.S. states, as shown in Table 1. Adjusted for population, Virginia's 455 MW per million residents ranks eighth among all states, per data from the U.S. Census Bureau's American Community Survey 5-Year estimates.[2]

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[1] U.S. Energy Information Administration (2024b). Electric Power Monthly.

[2] U.S. Census Bureau (2022). American Community Survey 5-Year Data (2009-2022).

Table 1. Ranking of U.S. States by Total Utility-Scale Capacity and Population-Weighted Capacity

State	Population (Millions)	Capacity (MW AC)	Capacity Rank	Capacity Per-Capita (MW per Million)	Capacity Per-Capita Rank
California	39.4	19,816	1	504	7
Texas	29.2	17,788	2	608	5
Florida	21.6	9,666	3	447	9
North Carolina	10.5	6,715	4	641	4
Nevada	3.1	4,928	5	1,587	1
Georgia	10.7	4,283	6	399	12
Virginia	8.6	3,928	7	455	8
Arizona	7.2	3,918	8	546	6
Ohio	11.8	2,460	9	209	26
Utah	3.3	2,191	10	667	3

Sources: U.S. Energy Information Administration (September, 2024). Electric Power Monthly Table 6.02.B; U.S. Census Bureau (2022), American Community Survey 5-Year Estimates.

Note: The total MW of utility-scale capacity indicated above is less than the total we have identified in our research, due to the lag in the reporting of installed capacity data to the U.S. Energy Information Administration.

Utility-scale solar is now the second-largest source of electrical generation capacity in Virginia, behind natural gas (13,727 MW) and just ahead of nuclear (3,586 MW). These systems produced 5.4 million megawatt-hours (MWh) of electricity in 2023, nearly 6% of all in-state electricity generation, making utility-scale solar the state's third-largest source of electricity generation after nuclear and natural gas.[3]

This report is based on a database, built and maintained by Virginia Energy and Virginia Commonwealth University, of utility-scale solar facilities operating in Virginia. As of June, 2024, the state has 94 utility-scale solar facilities, defined as facilities with a generation capacity of 5 MW and above. The total nameplate capacity of these sites is 4,423 MW (AC), for an average of 47.05 MW. This total capacity is higher than in Table 1, as there is a lag time in the reporting of data to EIA.

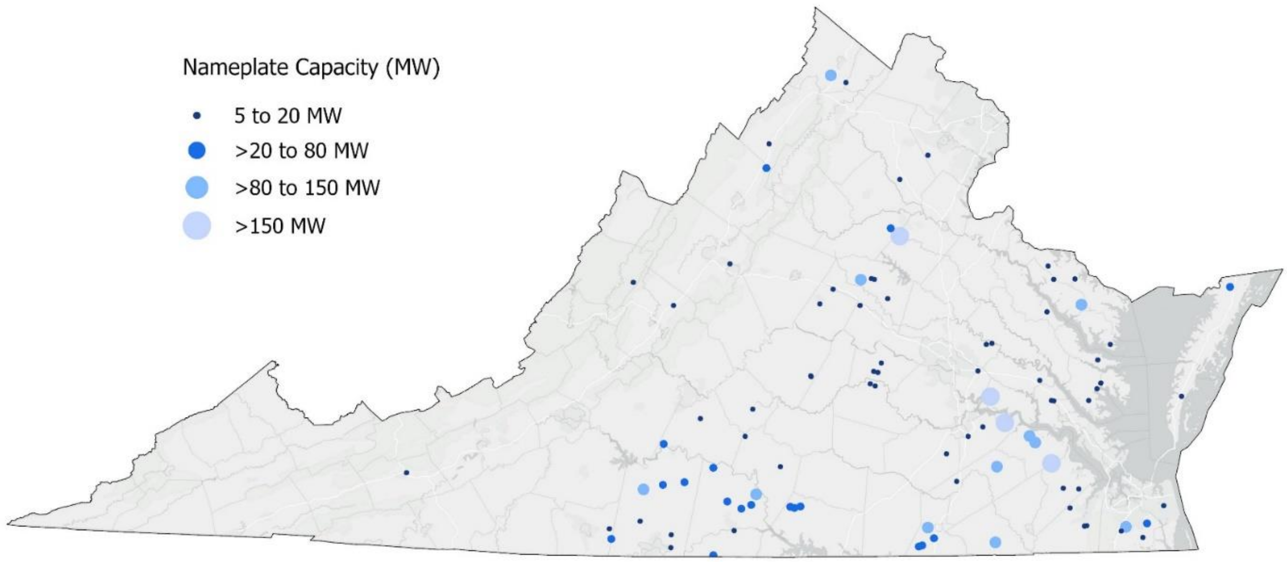
The vast majority (79) of the 94 utility-scale facilities in the data set are between 5 and 80 MW, with another 12 facilities between 80 and 150 MW, and only three with a capacity beyond 150 MW. The one extreme outlier (485 MW) is the Spotsylvania Solar facility (Pleinmont Solar), which at the time of construction was to be the largest solar PV facility in the eastern United States.[4] The median capacity is 20 MW, and over a quarter of the facilities are close to that total (between 19.7 and 20.0 MW). Many facilities are in this size range of 20 MW and under because they can interconnect to the distribution system and qualify for "small generator" interconnection procedures. Facilities above 20 MW are subject to more rigorous interconnection procedures for "large generators."[5]

3 U.S. Energy Information Administration (2024c). Electricity Data Browser.

4 Fitzgerald Weaver, J. (2018). "Virginia approves largest solar power plant east of the Rockies."

5 Federal Energy Regulatory Commission (2024). Generator Interconnection.

Figure 2. Location and Size of Utility-Scale Solar Projects in Virginia



Source: Virginia Department of Energy

The full data set and the findings of this analysis are significantly skewed by a few large facilities. One project (Spotsylvania Solar) makes up 11.5% of the total disturbed acreage calculated in this analysis. The three largest facilities (above 150 MW) make up 20% of both the total power capacity and total disturbed acreage across all utility-scale solar facilities in the dataset. By comparison, the 59 smallest facilities (5-20 MW) also make up 20% of both the total power capacity and total disturbed acreage in the dataset. Additionally, the 15 largest solar facilities, all above 80 MW, account for 51% of power capacity (2,275 MW) and 52% of disturbed acreage. The locations and relative sizes of these utility-scale solar facilities are shown in Figure 2 below.

Table 2. Distribution of Utility-Scale Solar Facilities

Generating Capacity	Number of Solar Facilities	Share of Total Acreage	Share of Total Capacity
5 to 20 MW	59	20%	20%
> 20 to 80 MW	20	28%	29%
>80 to 150 MW	12	32%	31%
> 150 MW	3	20%	20%
Totals	**94**	**100%**	**100%**

2. Background on Utility-Scale Solar Market and Policy Context

2.1. Utility-Scale Solar Pricing and Growth Trends

Demand for utility-scale solar is likely to continue growing to help meet the nation's ever-increasing electricity needs. The EIA estimates the country's total electricity use to rise from 3.84 million Gigawatt-hours (GWh) in 2020 to 4.24 million by 2030 and 4.61 million by 2040. This would be a total increase of 20.2% over 20 years, for an average annual growth rate (AAGR) of just under 1% per year.[6]

By comparison, the January 2024 load forecast report from PJM, the regional transmission organization (RTO) serving Virginia and much of the Mid-Atlantic and Midwest regions, specifically takes into account projected growth from electric vehicles and data centers, among many other factors. The PJM projections anticipate total annual electricity use within the region to grow roughly twice as quickly as the national projections from EIA. From a baseline usage of 813,329 GWh in 2024, the PJM projects an overall increase of 26% by 2034, to 1.02 million GWh, for an AAGR of 2.3%. Extending out to 2039, PJM expects regional electricity use to exceed 1.12 million GWh, a 38% total increase from 2024 and a 2.3% AAGR over that 15-year period.[7] PJM projects a far more rapid increase in electricity demand within the Dominion (DOM) sub-region. Here, PJM's modeling predicts the annual net energy load will double between 2004 and 2035 – from 127,947 to 260,020 GWh – representing a total increase of 103% and an AAGR of 7.7%. From there, the load growth is expected to grow at a slightly slower rate of 3.4% AAGR from 2035 through 2039, reaching a total of 308,147 GWh.[8] This adds up to a total projected growth in the DOM sub-region of 141% over a 15-year period, for an AAGR of 6.0%.

Solar energy, particularly utility-scale solar, is anticipated to continue expanding rapidly in response to this increased electricity demand. The EIA estimates that total solar PV generating capacity (distributed and utility-scale) in the United States will cross the 100 GW threshold sometime in 2025, double to above 200 GW by 2033, and increase to above 350 GW by 2050. Solar power is projected to generate a little over 218 billion kWh of electricity in 2025, equal to 5% of the EIA's projected U.S. electricity use in that year. Moving forward, solar electricity is projected to reach over 500 billion kWh by 2035 (12% of total projected use) and nearly 700 billion kWh by 2045 (14% of projected use).[9]

The US Solar Market Insight reports from Wood Mackenzie and the Solar Energy Industries Association (SEIA) provides another set of solar industry-focused market projections. Their latest report (Q3 2024) forecasts that nearly 30 GW of utility-scale solar capacity will be built in the U.S. in 2024, representing a slight 2% decline from 2023 due largely to interconnection delays and labor and equipment shortages. They project that all solar energy sectors (residential, commercial, community, and utility-scale) will collectively grow at roughly 4% AAGR from 2024-2029, with 186 GW (DC), or roughly 150 GW (AC), of new utility-scale solar added to the grid. This would be a significantly faster growth rate than anticipated in the EIA data discussed above, which estimates about 75 GW (AC) to be added between 2024 - 2029.[10]

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[6] U.S. Energy Information Administration (2024a). Annual Energy Outlook, Analysis and Projections, Table A8.

[7] PJM Interconnection, LLC (2024). PJM Load Forecast Report. Executive Summary, p. 2.

[8] PJM Interconnection, LLC (2024). PJM Load Forecast Report. See Table E-1.

[9] U.S. Energy Information Administration (2024a). Annual Energy Outlook, Analysis and Projections, Tables A8 and A16.

[10] U.S. Solar Energy Industries Association (2024). Solar Market Insight Report Q3 2024.

Another report, from the Lawrence Berkeley National Laboratory (LBNL) shows more detailed data from the Wood Mackenzie / SEIA reports, indicating that total utility-scale solar capacity is expected to reach about 500 GW by the year 2033, which again is significantly higher number than the EIA projection.[11]

The growth of utility-scale solar in Virginia and across the country has been propelled by rapidly decreasing prices. The National Renewable Energy Laboratory (NREL) conducts ongoing research into solar energy costs. Per their data, the installed cost of utility-scale solar dropped rapidly from 2010 to 2017, from $6.50 / watt to $1.13 / watt (DC). The price has hovered at around that same level since, sitting at $1.12 / watt in 2023 (all in 2022 dollars).[12] NREL also maintains an "Annual Technology Baseline (ATB) dataset, which tracks the costs of various renewable energy electricity generation technologies. Their data shows a national average capital expenditure (CAPEX) of $1.61 / watt (AC) for utility-scale solar in 2023, which corresponds to about $1.29 / watt (DC). Under a "moderate" market scenario, these costs are projected to drop to $1.19 / watt (AC) by 2030 and $0.82 (AC) by 2040. These numbers correspond to about $0.95 and $0.66 / watt (DC), respectively.[13]

2.2. U.S. Federal Policy Context for Utility-Scale Solar

The cost of utility-scale solar has also been supported by federal tax credits. These tax credits were initially established via the Energy Policy Act of 1992, and have been expanded and enhanced by the Inflation Reduction Act (2022). The Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (2021) has provided additional support for solar and other renewable energy sources.[14] The existing Energy Investment Tax Credit and the new Clean Energy Investment Tax Credit (CEITC) program supports investments in clean and renewable energy by providing owners of those systems with a tax credit worth a percentage of the installed cost of a renewable energy system.[15]

The new CEITC establishes a 30% rate for projects with a capacity below 1 MW (AC). For larger facilities, the base tax credit is worth only 6% of the total project value, but can be boosted to the full 30% if the project meets new prevailing wage and apprenticeship requirements spelled out under the Inflation Reduction Act (IRA).[22]

The Inflation Reduction Act also established a Clean Energy Production Tax Credit (CEPTC), which applies a tax credit for every kWh of electricity produced by an eligible clean energy system, including solar. Under the IRA, the PTC has a value of $0.0275 / kWh for projects with a capacity below 1 MW (AC), and a base value of $0.005 / kWh for larger projects, which can be boosted to the full $0.0275 / kWh rate if the project meets the IRA's prevailing wage and apprenticeship requirements.[16] These credits apply to all electricity produced by the system over the course of 10 years.[2] While solar energy projects are now eligible for both the CEITC and the CEPTC, they must choose one or the other, both cannot be applied to the same project. This decision depends on factors such as project costs, sunlight availability, and eligibility for bonus tax credits.

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[11] Bolinger, et al. (2023). Lawrence Berkeley National Laboratory. Utility-Scale Solar, 2023 Edition.

[12] National Renewable Energy Laboratory (2024). Solar Installed System Cost Analysis.

[13] National Renewable Energy Laboratory (2023). Annual Technology Baseline.

[14] The White House (2022). A Guidebook to the Bipartisan Infrastructure Law.

[15] The White House (2023). Clean energy tax provisions in the Inflation Reduction Act.

[16] U.S. Department of Energy, Solar Energy Technologies Office (2024). Federal solar tax credits for business.

2.3. State Policy Context for Utility-Scale Solar in Virginia

Virginia has seen a rapid increase in the development of utility-scale solar facilities in recent years, because of technological advancements, declining prices, increasing energy demand, and changes in federal and state policy. The growth in the total capacity of utility-scale solar in Virginia follows similar trends across the country.

Several relevant state policies in Virginia have been implemented to encourage the development of utility-scale solar, while also increasing the economic benefit of solar and mitigating development impacts on natural resources. The 2020 Virginia Clean Economy Act (VCEA) commits Virginia's major investor-owned electric utilities – Dominion Power and Appalachian Power – to produce 100% of their electricity from renewable sources by 2045 and 2050 respectively.[17] The VCEA creates targets for Dominion Energy to acquire 16,100 MW of solar or onshore wind, and Appalachian Power to acquire 600 MW of solar or onshore wind, by 2035. Accordingly, each utility now submits Annual RPS Development Plans, subject to approval by the State Corporation Commission, that outline their intentions to develop or acquire new solar projects on an annual basis.[18]

The Virginia General Assembly has also passed additional complementary legislation to facilitate the development of utility-scale solar facilities and provide additional incentives to local host communities. This includes allowing localities to negotiate siting agreements, establish revenue sharing ordinances, and allowing cash payments or public improvements contributions from solar developers.[19] Collectively, this new legislation presents several opportunities for localities to work with solar developers to approve solar facilities that can have a greater local economic impact.

Also, in response to concerns about the impacts of solar development on natural resources, the Virginia General Assembly passed HB 206 in 2022.[20] This policy amends the Department of Environmental Quality's (DEQ) Permit-by-Rule (PBR) process that applies to solar facilities greater than ten acres in size, and between five and 150 MW in generating capacity. Specifically, solar facilities with disturbances of more than 10 acres of prime agricultural soils or more than 50 acres of contiguous forest lands will now be subject to additional avoidance and mitigation measures once the regulations are finalized by December 31, 2024.

Solar facilities are also first permitted by local governments, to ensure that a project complies with all local land use ordinances. Compliance with local land use requirements is an important aspect of regulating the development of solar facilities. As solar development has increased, many localities have made updates to their local ordinances and polices in consideration of balancing the interests of future growth areas, prime farmland, sensitive environmental or historic sites, and adjacent business or residential interests. Given the variety of local land use factors that are considered when approving solar facilities, local and regional planners have an important role in providing clear guidance on how the development of solar facilities can be integrated within a local community while also supporting Virginia's overall energy needs.

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[17] Virginia Legislative Information System (2020). HB 1526/SB 851.

[18] See for example: Virginia State Corporation Commission (2024). Case Summary for Case Number: PUR-2024-00147: Virginia Electric and Power Company.

[19] Code of Virginia. § 58.1-2636., § 15.2-2316.6., § 15.2-2288.8.

[20] Virginia Legislative Information System (2022). HB 206.

2.4. Prior Research on the Land Use Impacts of Utility-Scale Solar

Electricity generation is an inherently land-intensive process. The term "energy sprawl" has been used to describe how meeting energy demands is one of the largest drivers of land use change in the United States. Past estimates suggest that energy-driven land use change could impact up to 2,500 square miles of land in the United States per year through 2040.[21] While solar is widely considered a clean energy source, the widespread implementation of utility-scale solar facilities may impact large areas of land and place development pressure on undeveloped rural areas.[22]

According to a 2013 study by NREL, utility-scale solar had a capacity-weighted average of 8.9 acres per MW (DC), including "land directly occupied by solar arrays, access roads, substations, service buildings, and other infrastructure."[23] A 2014 study of utility-scale solar facilities in California used secondary data sources to estimate the "land footprint" of those facilities, and found their "land use efficiency" to be 35 watts (DC) / m^2, which translates to 7.05 acres / MW.[24] These studies suggest a range of 9 – 12 acres / MW (AC), assuming an inverter loading ratio of 1.34.[25] A more recent study by the Lawrence Berkeley National Laboratory calculated a "power density" of 0.20 – 0.35 MW (DC) per acre, which translates to between 3 – 5 acres per MW (AC), however, this study only measured the area of the solar panels.[26]

Other studies have viewed the land use requirements of solar favorably, as compared to other energy sources. While solar may require a much larger direct land footprint per MW of power capacity,[27] solar and other renewables can use the same plot of land indefinitely, unlike extractive energy sources that must expand their footprint to acquire additional resources. Consequently, over the full-time life cycle of an energy production project, solar may ultimately require a smaller land footprint for an equivalent amount of cumulative energy production.[28, 29] Additionally, solar is considered much safer than other energy sources, requiring less additional land for buffering and spacing from other uses. Finally, solar is considered less likely to cause long-lasting harm to the quality of land at a particular site.[30]

Very few of these studies have identified findings specific to Virginia. In one case, an early NREL study found that meeting the state's energy needs with solar PV would require a total solar footprint of 233 m^2 per-capita, which could occupy around 1.6% of the state's total land area.[31] A study supported by the Chesapeake Conservancy identified the land area and prior land coverage of utility-scale solar facilities across the Chesapeake Bay watershed, but did not calculate the ratio of acres per MW.[32] The first version of our study found that the 38 utility-scale solar facilities operational in Virginia as of the end of 2020 had a median disturbed area ratio of 7.21 acres / MW.[33]

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[21] Trainor, et al. (2016). Energy Sprawl is the Largest Driver of Land Use Change in the United States.

[22] Poggi, Firmino, & Amado (2018). Planning Renewable Energy in Rural Areas.

[23] Ong, et al. (2013). Land-Use Requirements for Solar Power Plants in the United States.

[24] Hernandez, Hoffacker, & Field (2014). Land-Use Efficiency of Big Solar.

[25] National Renewable Energy Laboratory (2023). Annual Technology Baseline.

[26] Bolinger and Bolinger (2022). Land Requirements for Utility-Scale PV.

[27] Wachs and Engel (2021). Land Use for United States Power Generation.

[28] Fthenakis and Kim (2009). Land Use and Electricity Generation: A Life-Cycle Analysis.

[29] Trainor, et al. (2016). Energy Sprawl is the Largest Driver of Land Use Change in the United States.

[30] Turney and Fthenakis (2011). Environmental Impacts from the Installation and Operation of Large-Scale Solar.

[31] Denholm and Margolis (2008). Land-Use Requirements and the per-Capita Solar Footprint.

[32] Evans, et al. (2023). Predicting patterns of solar energy buildout.

[33] Berryhill (2021). Utility-Scale Solar in Virginia: An Analysis of Land Use and Development Trends.

3. Methodology

This analysis is built upon an updated spatial dataset of utility-scale solar sites in Virginia that were constructed as of June 2024, consisting of vector polygons outlining the “disturbed area” footprints for each utility-scale solar site in Virginia. This data set was built specifically for the original study in 2021, and has subsequently been updated to add 56 utility-scale solar facilities that have been constructed through June 2024. Building and maintaining the dataset requires cross-referencing of information from satellite imagery, aerial photography, and site maps to georeference the disturbed site areas for each utility-scale solar project. As new higher-resolution aerial imagery has become available, the boundaries for existing facilities in the dataset were refined to better match the disturbed area. As a result, the estimates for some facilities may differ from the 2021 study.

For this analysis, “utility-scale” means facilities with a nameplate capacity of greater than or equal to five MW (AC). The “disturbed area” includes the footprints of the solar panels themselves, as well as additional land disturbances for other uses such as inverters, fencing, and stormwater features. The footprints in this analysis do not include any undisturbed land on the applicable parcels. The disturbed area used in this analysis is also different from the “permitted area”, which is generally the total acreage of all land parcels identified in the larger project permit. This approach provides a much more nuanced understanding of the rate at which land is being used for utility-scale solar. Additional details on this methodology are available in Appendix A.

This updated analysis did not specifically consider the panel array boundaries, unlike in the 2021 report. Digitizing both the disturbed area and the panel array boundaries was duplicative and not critical for updating the key findings of the report. Additionally, the Lawrence Berkeley National Laboratory and the U.S. Geological Survey released the U.S. Large-Scale Solar Photovoltaic Database which now provides the locations and array boundaries of any ground-mounted solar facility in the U.S.[34]

Figure 3. Example of Solar Facility Permitted vs. Disturbed Area Footprints

[34] U.S. Geological Survey (2024). The US Large-Scale Solar Photovoltaic Database.

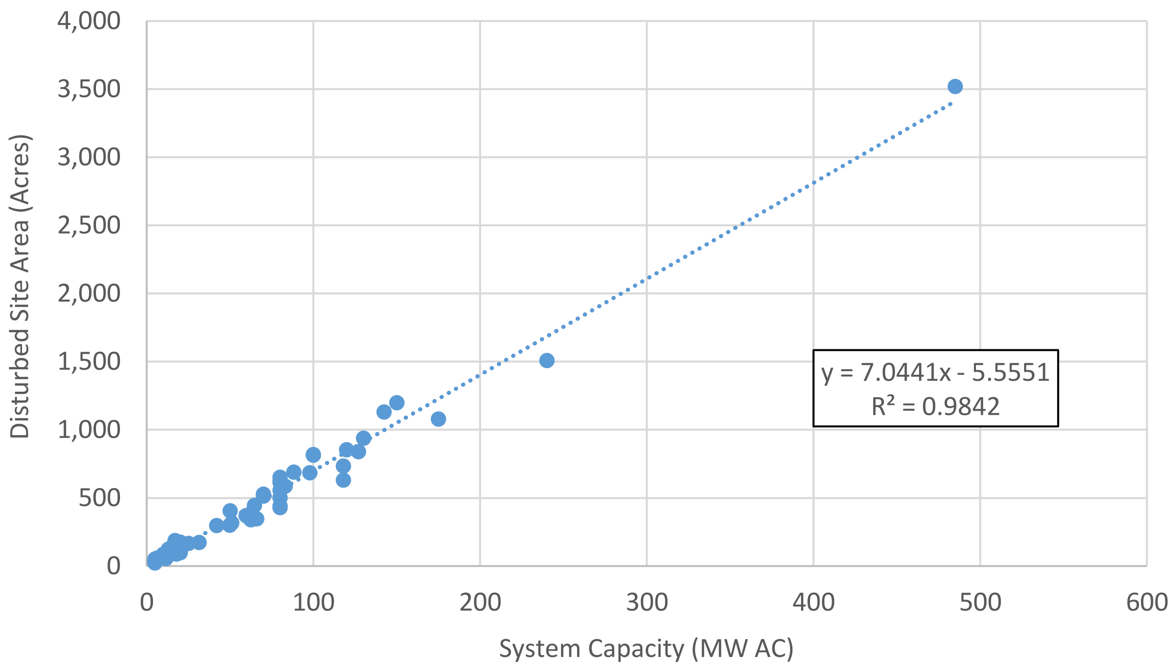
4. Land Use Impacts of Utility-Scale Solar in Virginia

4.1. Total Disturbed Acreage and Ratio of Disturbed Acres per MW

Per the research methods described above, we find that the total disturbed acreage across the 94 utility-scale solar facilities in our database is 30,632 acres. This is equal to about 0.11% of Virginia's 25.27 million acres of total land, not including land coverage classified as "open water."[35] The overall disturbed acreage ratio across all facilities is 6.93 acres / MW, and the median of the project-by-project ratios is also 6.93 acres / MW.

The chart in Figure 5 demonstrates the linear relationship between nameplate capacity and disturbed area footprint across all utility-scale solar facilities in our dataset. It shows that there is a strong linear relationship between system capacity and disturbed acreage. For each MW increase in capacity there is a 7-acre increase in required area, which is consistent with the average acres per MW indicated above. The figure indicates that there are limited outliers, that fall far above or below the trendline, and that larger sites are not necessarily more space-efficient than smaller sites.

Figure 4. Linear Relationship between Disturbed Site Area and Megawatt Capacity



These findings illustrate that the disturbed area ratio for utility-scale solar in Virginia is significantly lower than the range 9 – 12 acres / MW (AC) suggested by some of the earlier studies,[36, 37] although the methods employed by those earlier studies varied substantially from those used here.

[35] Virginia Geographic Information Network (2016b). Virginia Land Cover Download Application.

[36] Ong, et al. (2013). Land-Use Requirements for Solar Power Plants in the United States.

[37] Hernandez, Hoffacker, & Field (2014). Land-Use Efficiency of Big Solar.

4.2. Prior Land Cover at Utility-Scale Solar Project Sites

The disturbed acreage footprints for each project site were then overlaid with data from the Virginia Geographic Information Network (VGIN) Virginia Land Cover Dataset (VLCD), to identify the land coverage classifications of those sites prior to their conversion to utility-scale solar development.[38] This process reveals that the vast majority of disturbed area acreage had previously been classified as forest (50%) and cropland (28%), followed by pasture (11%), as shown in Table 3 below.

Table 3. Land Cover of Utility-Scale Solar Disturbed Areas vs. Land Cover of All Virginia

Land Cover Classification	Land Cover of Solar Sites		Land Cover of Virginia	
	Total Acres	Percent	Total Acres	Percent
Barren	3	0%	69,929	0%
Cropland	8,433	28%	1,335,967	5%
Forest	15,393	50%	14,770,460	54%
Harvested/Disturbed	2,258	7%	601,685	2%
Impervious	79	0%	987,354	4%
NWI/Other	139	0%	1,170,635	4%
Open Water	2	0%	2,107,259	8%
Pasture	3,246	11%	3,107,189	11%
Shrub/Scrub	335	1%	173,310	1%
Tree	518	2%	1,612,976	6%
Turf Grass	226	1%	1,439,213	5%
Totals	**30,632**	**100%**	**27,375,975**	**100%**

Table 3 also compares these numbers to the overall percentage of land in Virginia that falls into each land cover classification. Of note, both Forest and Pasture account for a smaller share of the land area converted to utility-scale solar, relative to their respective percentages of the state's total land area (i.e., 50% of the land converted to solar use had been Forest, whereas 54% of all land cover statewide is classified as Forest). On the other hand, Harvested / Disturbed and Cropland represent higher shares of the land that has been converted to solar, compared to their respective shares of all land cover statewide. This is particularly true of Cropland, which represents 28% of the land that has been converted to solar but only 5% of all statewide land cover.

In most cases, the total acreage that has been converted to solar represents no more than 0.1% of the state's total land cover within that classification. For example, the 15,393 acres of Forest land cover that has been converted to utility-scale solar use, represents 0.1% of the 14.77 million acres of Forest land cover in Virginia. The only classifications for which more than 0.1% of land cover have been converted to utility-scale solar are Shrub / Scrub (0.19%), Harvested / Disturbed (0.38%), and Cropland (0.63%).

[38] Virginia Geographic Information Network (2016b). Virginia Land Cover Dataset.

Some caveats are required when interpreting this data. First, while 50% of the disturbed land at utility-scale solar sites was classified as Forest, Table 2 shows that an additional 7% was classified as Harvested / Disturbed, and 1.6% as Tree. The VLCD describes these classifications as follows:[39]

- Forest: areas of more than one acre in size, characterized by tree cover of natural or semi-natural woody vegetation, including deciduous, evergreen, and mixed foliage types
- Tree: areas of less than one acre in size, characterized by tree cover of natural or semi-natural woody vegetation, including deciduous, evergreen, and mixed foliage types
- Harvested / Disturbed: areas where there is 30% canopy cover or less, including clear-cut forest, temporary clearing of vegetation, and other dynamically changing land cover

In other words, the Harvested / Disturbed category is comprised of land that may have previously been forested, but then harvested prior to when the VLCD was released in 2016. Some of the land classified as Harvested / Disturbed may have been replanted with tree cover, while conversely, some of the land classified as Forest may have been harvested prior to its conversion to solar development. It is also important to recognize that some of the land currently occupied by solar facilities could have undergone a separate, unrelated change in land cover or development status, sometime between 2016 and the construction of the applicable utility-scale solar facility.

Of the 94 projects in the data set, 71 can be characterized as having a dominant prior land use type, which is defined as having a single VLCD land cover classification representing at least 65% of the disturbed land area for the project site. Of these, 31 projects were predominantly on Forest land, with 28 on Cropland, 10 on Pasture, and one each on Harvested / Disturbed and Turf / Grass land. As demonstrated in Table 4, the facilities located on predominately Forest land tend to be substantially larger, on average, than any other type of project, in terms of both MW capacity and total disturbed acreage.

Table 4. Characteristics of Utility-Scale Solar Facilities with Dominant Prior Land Classifications

Dominant Land Cover	Number of Facilities	Average MW	Median MW	Average Disturbed Acres	Average Disturbed Acres / MW	Median Disturbed Acres / MW
Forest	31	69.89	49.90	486	6.69	6.38
Cropland	28	31.61	20.00	223	7.21	7.46
Pasture	10	35.99	25.70	244	6.88	7.15
All Other Facilities	25	40.45	20.00	274	7.01	6.94
All Facilities	94	47.05	20.00	326	6.93	6.93

[39] VGIN (2016a). Technical Plan of Operations: Virginia Statewide Land Cover Data Development.

4.3. Additional Land Use Considerations

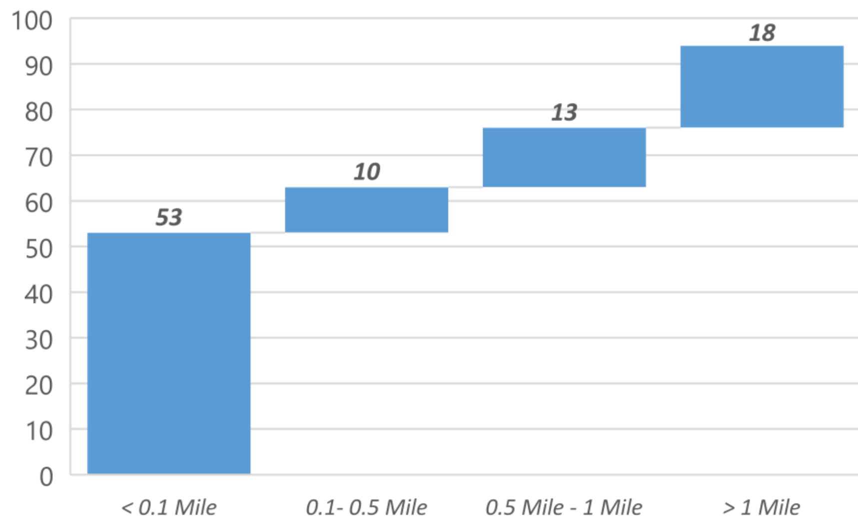
It is important to note that this analysis is based on land cover data, which describes the physical characteristics of a land area (forest, cropland, pasture). While "land cover" data can serve as a proxy for "land use," it does not fully describe the land use or primary human activity occurring on a given site. For example, a site classified by forest land cover does not indicate if the land is used primarily for timber production, conservation, or a mix of other uses. Similarly, many brownfields, capped landfills, and reclaimed mined lands may have a land cover classified as pasture, cropland or scrub once the site has been fully revegetated. Since land cover data is collected at a point in time, it may not recognize previous land uses without additional context.

Figure 5. Aerial Imagery: Hollyfield Solar (17 MW) & Hollyfield II Solar (13 MW)

For example, as shown in Figure 5, the Hollyfield I & II solar facilities in King William County are located on a site that was classified as 97% cropland based on the quantitative results of this land cover analysis. This site was previously disturbed and used for the surface mining of sand and gravel prior to the collection of the 2016 land cover data used in this analysis. The mining permit for this site was established in 1996 and was released in 2007. The site went through a reclamation process and was returned to an agricultural use. The total disturbance area of the previous mining operation was 223 acres. The two solar facilities have a disturbance area of 258 acres and reuse most of the previously disturbed area that was used for a surface mining operation.

A quantitative analysis of land cover on a specific site also does not recognize nearby infrastructure or adjacent land uses. For example, the siting of utility-scale solar facilities is heavily influenced by proximity to existing infrastructure such as transmission lines and substations. Of the 94 facilities considered in this analysis, 53 facilities (56%) at their closest point are less than 0.1 miles from an existing transmission line. A total of 76 facilities (81%) are within 1 mile of a transmission line. Only 18 facilities in this analysis were farther than 1 mile from a transmission line and they are all 20 MW or less in rated capacity and therefore are interconnected at the distribution level.

Figure 6. Distance of Utility-Scale Solar Sites to Nearest Transmission Line



The influence of a site's proximity to existing land uses, local zoning, and future land use designations is also not captured by this analysis of land cover. Certain areas may be more likely to be considered for development based on future land use designations and proximity to nearby industrial uses. Below are examples of solar facilities that have been sited on undeveloped land but are also sited close to other industrial land uses. In Figure 8, Foxhound Solar (83 MW) in Halifax County is on a 586-acre site, classified as 68% Forest land cover, near the Clover Power Station and its nearby coal ash landfills.

Figure 7. Aerial Imagery: Foxhound Solar (83 MW)

Similarly, the Remington Solar (20 MW) facility in Fauquier County is located adjacent to the Remington Power Station on a site bisected by power lines from a nearby substation. The site is also near other industrial uses including an active quarry and concrete plant. In the quantitative analysis, the site was classified as 76% Cropland.

Figure 8. Aerial Imagery: Remington Solar (20 MW)

Waverly Solar, located in Sussex County, is spread across several parcels totaling 733 acres. The site was classified as 80% Forest, based on the land cover analysis. However, parts of this solar site are in close proximity to the Sussex County Atlantic Waste Disposal Facility. This landfill is roughly 1,300 acres and is one of the largest landfills in the U.S. Two transmission line corridors also run along the edge of the project site.

Figure 9. Aerial Imagery: Waverly Solar (118 MW)

5. Quality of Impacted of Forest Land and Cropland

The next step in the analysis was to examine the "quality" of the cropland and forest land that has been converted to utility-scale solar use, from the perspective of their agricultural suitability and forest conservation values. To do so, we used GIS to overlay the vector polygons representing the disturbed area footprints of each project site with underlying data from the Virginia Department of Conservation and Recreation's Virginia Agricultural Model and the Virginia Department of Forestry's Forest Conservation Value (FCV) Model. Additional details on this methodology can be found in Appendix A.

5.1. Impacts of Utility-Scale Solar on Forest Land

To measure the quality of impacted of forest lands, this analysis used the Virginia Department of Forestry's (VDOF) Forest Conservation Value (FCV) Model. It is important to note that VDOF periodically updates the FCV model and releases new versions of this model. The previous version of this solar analysis, completed in 2021, used the 2018 version of the FCV model. While a new version of the FCV model is available, this analysis again used the 2018 version of the FCV model, to keep the underlying data sources consistent with the previous analysis.

As mentioned above in Table 3, 15,393 acres of solar-disturbed land were identified as Forest in the Virginia Land Cover dataset. This equals 50% of the total disturbed area from all utility-scale solar facilities in our database. Of that Forest-classified solar-disturbed land, 13,852 acres was classified in the Virginia Department of Forestry's Forest Conservation Value (FCV) model.[40] Table 4 shows that the majority (54%) of the FCV-designated Forest land that has been converted to utility-scale solar falls into the two lowest categories of Average to Moderate conservation value. Another 24% falls into the middle tier of High conservation value, and only 21% is in the two highest tiers of Very High to Outstanding.

Table 5. Forest Conservation Values of Solar-Disturbed Forest Land vs. all Forest Land in Virginia

Forest Conservation Value Classifications	Forest Conservation Value, Solar Sites on Forest Land		Forest Conservation Value, All Land in Virginia FCV Model	
	Total Acres	Percent	Total Acres	Percent
Class 1. Average	3,351	24%	2,563,327	19%
Class 2. Moderate	4,173	30%	2,702,972	21%
Class 3. High	3,390	24%	2,724,439	21%
Class 4. Very High	2,113	15%	2,558,724	19%
Class 5. Outstanding	824	6%	2,607,250	20%
Totals	**13,852**	**100%**	**13,156,710**	**100%**

Sources: Virginia Department of Forestry (2018). Forest Conservation Value Model (2018 Version); Virginia Geographic Information Network (2016). Virginia Land Cover Download Application.

By comparison, the right-hand columns show that over 13 million acres of Virginia land is classified in the FCV model, of which the solar-disturbed Forest acreage accounts for only 0.11%. Of all land in the

[40] Virginia Department of Conservation and Recreation (2020). Forest Conservation Value.

FCV model, 39% is rated as Very High or Outstanding, which indicates that the solar-disturbed Forest land is generally of lower conservation value than the state average.

When considering the impact of utility-scale solar on forest land, it is important to point out the disproportionate effect of a few facilities. Only 12 solar facilities impacted more than 50 acres of forest land classified as Very High (Class 4) or Outstanding (Class 5) by the FCV model. Of the 2,937 acres of solar disturbed Forest land rated as Very High or Outstanding by the FCV model, just over half (51%) comes from two facilities:

- *Spotsylvania (Pleinmont)*, the state's largest project at 485 MW, accounts for 849 Forest acres rated as Class 4-5 in the FCV model. This represents 29% of all the solar-disturbed Class 4-5 Forest acres in the analysis.
- *Fort Powhatan* in Prince George County, the state's fourth-largest project at 150 MW, sits on 646 acres of Class 4-5 Forest land, which represents 22% of all the solar-disturbed Class 4-5 Forest acres in the analysis.

Additionally, there are some smaller facilities that sit primarily on Class 4-5 forest land, per the FCV model. Together, these four facilities account for 1.4% of the state's total utility-scale solar capacity in MW, but 13% of the total solar-disturbed Class 4-5 forest land:

- *Scott II* (Powhatan County): 20 MW, with 99% of solar disturbed acreage on Class 4-5 Forest land
- *Scott I* (Powhatan County): 17 MW, with 83% of solar disturbed acreage on Class 4-5 Forest land
- *Apple Grove* (Louisa County): 19 MW, with 81% of solar disturbed acreage on Class 4-5 Forest land
- *Martin* (Goochland County): 5 MW, with 76% of solar disturbed acreage on Class 4-5 Forest land

Altogether, the six facilities identified above account for 60% of the solar-disturbed Very High (Class 4) conservation value Forest lands, and 64% of the solar-disturbed Outstanding (Class 5) Forest lands.

5.2. Impacts of Utility-Scale Solar on Cropland

The discussion around the impacts of utility-scale solar on agricultural productivity is often framed in terms of its impacts on "prime farmland," as designated by the US Department of Agriculture (USDA). The USDA defines "prime farmland" as land that has "the best combination of physical and chemical characteristics" for producing food, feed, fiber and other crops.[41] In total, 41% (12,541 acres) of the solar-disturbed land in the analysis was designated as prime farmland, based on NRCS SSURGO data. By comparison, 21% of all Virginia land (5.1 million acres) is designated as prime farmland. Thus, the 12,541 acres of solar-disturbed land that is designated as prime farmland accounts for 0.25% of all prime farmland Virginia.[42]

However, like land cover classifications, a prime farmland designation is not representative of the land use of a given land area. Many land areas designated as prime farmland may be used for non-agricultural purposes, such as conserved forests, or as developed areas. Similarly, many land areas used for growing crops may not be designated as prime farmland. As a result, this analysis sought to evaluate the degree to which utility-scale solar is taking place on cropland with high agricultural soil quality.

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[41] Natural Resources Conservation Service (2024). Soil Data Access (SDA) Prime and other Important Farmlands.

[42] Virginia Tech Center for Geospatial Information Technology (2024). Virginia's Land and Energy Navigator.

While there are different methods to estimate total farmland acreage and its quality, this analysis only measured the agricultural suitability of lands with a Cropland land cover classification. This analysis used the Agricultural Soil Quality Classifications from the Virginia Agricultural Model. The Agricultural Soil Quality Classification is a score that is based on farmland classifications from the SSURGO database, the non-irrigated capability class, and the National Commodity Crop Productivity Index (NCCPI).[43]

As discussed in Section 4.2, 28% of the solar-disturbed land in this analysis (8,433 acres) was classified as Cropland in the Virginia Land Cover dataset. This percentage is substantially higher than the 5% of all state land cover that is classified as Cropland. Currently, the solar-disturbed acreage represents 0.63% of Virginia's total Cropland (1.34 million acres). Table 6 shows that of those 8,433 acres of solar-disturbed Cropland, only 3% falls into the two lowest Agricultural Soil Quality categories (Class I and II). Of the remaining solar-disturbed Cropland, 23% falls into the middle category (Class III) and 74% is on land with the highest Class IV and V agricultural soil quality classifications.

Table 6. Soil Quality Score of Cropland Impacted by Solar Facilities vs. all Virginia Cropland

Agricultural Soil Quality Classifications	Soil Quality Score, Solar Sites on Cropland		Soil Quality Score, All Cropland in Virginia	
	Total Acres	Percent	Total Acres	Percent
Class I *(Low Suitability)*	12	0%	14,886	1%
Class II	223	3%	78,509	6%
Class III	1,938	23%	143,332	11%
Class IV	2,233	26%	341,455	26%
Class V *(High Suitability)*	4,027	48%	757,358	57%
Totals	**8,433**	**100%**	**1,335,539**	**100%**

Sources: Virginia Department of Conservation and Recreation (2015). Virginia Conservation Vision Agricultural Model; Virginia Geographic Information Network (2016). Virginia Land Cover Download Application.

It is important to note that the Virginia ConservationVision Agricultural Model dataset referenced here provides Agricultural Soil Quality classifications for all land in the state, regardless of how that land is actually being used. Therefore, any acreage with a Cropland classification in the Virginia Land Cover dataset is likely to skew towards the higher Agricultural Soil Quality classifications. This is demonstrated in the right-hand columns of Table 6, which shows that of the 1.34 million acres of designated Cropland in Virginia, the majority (57%) is in the highest Class V classification, and 83% is in Class IV and V combined. Thus, the solar-disturbed Cropland skews slightly away from Class IV and V soil quality land, compared to the state average of all Cropland.

As was the case with the Forest Land Classifications above, a relatively small number of utility-scale solar facilities account for the majority of the impacts to the highest quality Cropland. Of the 4,027 acres of solar on Class V soil quality Cropland, just five facilities - *Southampton*, *Bartonsville*, *Cavalier*, *Eastern Shore,* and *Greensville* – collectively account for 51% of the impacts to Class V soils on Cropland.

[43] Virginia Department of Conservation and Recreation (2015). Agricultural Model Technical Report.

6. Conclusions and Key Takeaways

The buildout of utility-scale solar facilities in Virginia has increased significantly, both in number and in area, over the last few years. As the development of solar continues, it is important to continue to study and contextualize the patterns in the associated land use transition. Changes in land use have important geographic, social, economic, and political implications, and the development of utility-scale solar is part of a much larger conversion of land brought on by development and human-activity of all kinds.

As shown in Table 7 below, the total number of utility-scale solar facilities operating in Virginia has increased by nearly 150%, from 38 to 94 facilities, since the prior version of this research was conducted in Spring 2021.[44] The total nameplate capacity from utility-scale solar has increased 161%, from 1,692 to 4,423 MW. The average project size has increased slightly, in terms of both total capacity and total disturbed acreage, despite the fact that the largest project in the dataset (Spotsylvania Solar) is included in the 2021 totals. Additionally, the median disturbed area ratio dropped from 7.21 to 6.72 acres per MW, suggesting that these facilities are becoming more efficient in their use of space.

Table 7. Utility-Scale Solar Trends in Virginia from 2020 to 2024

	Facilities through 2020	Facilities 2021-2024	All Facilities	Percent Change (2021-2024)
Total number of utility-scale solar facilities	38	56	94	147%
Total installed capacity (MW AC)	1,692	2,731	4,423	161%
Total disturbed area (acres)	12,305	18,327	30,632	149%
Average capacity (MW) per project	44.52	48.77	47.05	6%
Average disturbed acreage per project	324	327	326	1%
Median disturbed area ratio (acres / MW)	7.21	6.72	6.93	-4%

* *Note that the exact totals for MW capacity, disturbed acreage, etc. listed here for "Facilities through 2020" all differ slightly from the actual totals shown in the 2021 report, as we have refined our methodology and developed more accurate disturbed area footprints for some of those earlier projects.*

Another important finding of this analysis is the relative change between the 2021 study and the current 2024 totals. The 2021 study included all solar facilities that were developed in Virginia from the first facility in 2016 through the end of 2020. As shown in Table 8 below, the percentage of solar sites on land previously classified as Forest decreased from 58% to 50%, while the percentage for Pasture increased, and the Cropland percentage essentially held steady. Of the over 18,000 acres converted to solar development between 2021 and 2024, 45% was Forest, versus 28% Cropland, 13% Pasture, and 14% other.

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[44] Berryhill (2021). Utility-Scale Solar in Virginia: An Analysis of Land Use and Development Trends.

Table 8. Previous Land Cover of Utility-Scale Solar Disturbed Areas, Major Land Cover Types only

Land Cover Classification	Percent of Land in Solar Sites – 2016 to 2021	Percent of Land in Solar Sites – 2016 to 2024	Percent of Land in Solar Sites – 2021 to 2024
Forest	57%	50%	45%
Cropland	27%	28%	28%
Pasture	7%	11%	13%

While the summation of the solar disturbed acres across Virginia informs most of the discussion in this report, it is also important to consider the project-specific impacts that are detailed in the data tables in the Appendix. The aggregate statewide impacts are ultimately heavily influenced by a relatively small number of projects out of the 94 projects considered in this analysis. For example, as has been highlighted throughout this report:

- Fifteen (15 of 94) solar facilities account for 52% of the total disturbed acreage.
- Five (5 of 94) solar facilities account for 51% of the total impacts to Class V high suitability soils on cropland.
- Two (2 of 94) solar facilities account for 51% of the total impacts to Very High (Class 4) or Outstanding (Class 5) forests.

Finally, it is important to acknowledge the limitations of the conclusions from this desktop analysis. The drivers of land use change are dynamic and complex, and it is difficult to properly contextualize the scale of land use change caused by utility-scale solar alongside the many other drivers of land use change in Virginia. Additionally, it is difficult to fully recognize the implications of the land conversion caused by utility-scale solar development. Utility-scale solar facilities can offer both disadvantages and benefits to the land depending on the history of a given site and the development practices used to build a project. As environmental regulations continue to improve, along with more advanced development practices and more efficient solar technology, there remains great opportunity to ensure that utility-scale solar facilities minimize their impact to Virginia's natural landscape.

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Appendix A. Detailed Methodology

This analysis is built off the methodology used in the 2021 solar land use analysis.[45] Accordingly, this updated analysis used an expanded and updated dataset of solar disturbed area footprints and overlaid it on the same data layers as the 2021 analysis. This analysis kept the data layers constant to allow for comparisons of trends from the previous analysis. The land cover, forest quality, and soil quality score data layers used in this analysis are the same data layers that were used in the 2021 analysis.

Land Cover Analysis: VGIN Landcover Data

A statewide featureclass of the VGIN land cover data released in 2016 was used for the land cover analysis.[46] This dataset is represented at a 1-meter resolution. Data were already in the Virginia Lambert Conformal Conic projection. For additional information about the dataset and descriptions of each land cover classification, please review the Technical Plan of Operations.[47]

To conduct the analysis, the solar site boundaries were brought into ArcGIS Pro and projected to Virginia Lambert Conformal Conic NAD 1983. The VGIN landcover was brought into ArcGIS Pro. The Intersect Tool was used to overlay the land cover and solar sites. The summary statistics tool was used to summarize the total area of each land cover type within each unique solar site. The final table was exported to a .csv, opened in Excel, and formatted using a Pivot Table.

Additionally, this analysis isolated forestland and cropland disturbed by solar development and conducted an additional level of analysis that is detailed below.

Selecting Forestland

In ArcGIS Pro, the Analysis Tools Select, was used to extract class 41, forest within solar sites. The use of the class 41 is consistent with the first solar analysis.

Selecting Cropland

In ArcGIS Pro, the Analysis Tools Select, was used to extract class 82, cropland within solar sites. The use of the class 82 is consistent with the first solar analysis.

Forestland Quality Analysis: DOF FCV Analysis

The Virginia Department of Forestry's Forest Conservation Value (FCV model) is a tool "designed by the VDOF to strategically identify the highest priority forestland for conservation in Virginia. The intent is to maximize the efficiency of limited resources by focusing conservation efforts on the highest quality, most productive, and most vulnerable forestland statewide." The FCV model is represented at 30-meter resolution and is updated periodically by VDOF.

The previous 2021 report used a 2018 version of the FCV Model, but the most recent version of the model available online at the time of this updated report is the 2020 FCV model. To be able to compare with the findings of the previous report, the 2018 FCV model was used as the primary layer to measure

[45] Berryhill (2021). Utility-Scale Solar in Virginia: An Analysis of Land Use and Development Trends.

[46] VGIN (2016b). Virginia Land Cover Download Application.

[47] VGIN (2016a). Technical Plan of Operations: Virginia Statewide Land Cover Data Development.

forest quality. The more recent DOF FCV 2020 model was also downloaded from the Virginia Department of Forestry website and used as a supplemental data source.[48]

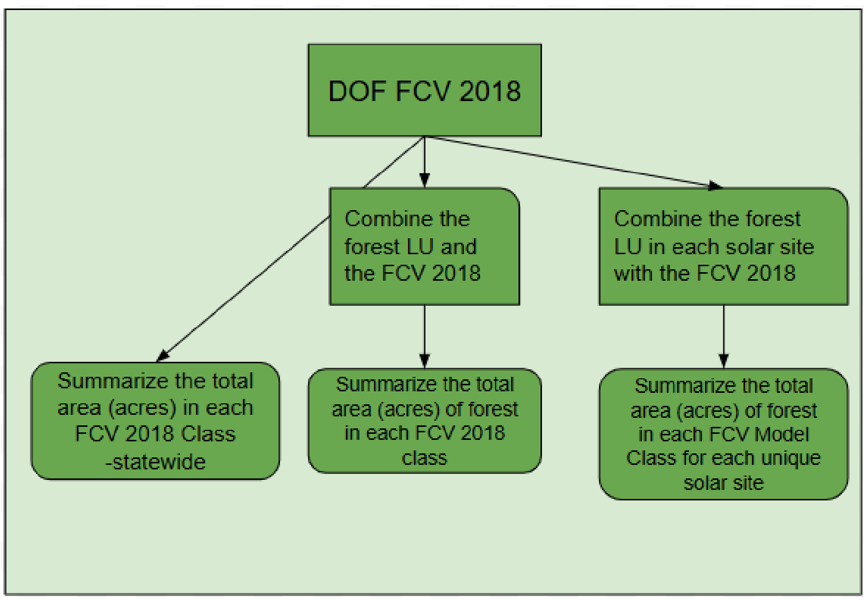
The FCV datasets were downloaded as rasters and the classification breaks representing model classes were set. Data was then converted from raster to a polygon feature class, with no simplification to retain the feature shape. Conversion to vector allows for use of geoprocessing tools and provides more discrete calculations versus raster. Data was in the Virginia Lambert Conformal Conic NAD 1983 projection.

Statewide Area Calculations

In ArcGIS Pro, Summary Statistics was used to calculate the total area of each FCV Model class in the state. Values were converted to acres, and exported to an excel spreadsheet.

Solar Site Forest FCV Model Area

To calculate the total area of the forested FCV classes within each solar site, the Intersect Tool was used to overlay the FCV model with forest area and the solar sites. This computes the geometric intersection of all three layers. Summary statistics was used to calculate the total area of forested area FCV model classes in each unique solar site. Values were converted to acres, and exported to an excel spreadsheet. A Pivot table was used to format the table.



[48] Virginia Department of Forestry (2024). Webmap Gallery.

Cropland Quality Analysis: Virginia ConservationVision Agricultural Model - Soil Quality Score

The Soil Quality Score, intended to quantify soil suitability for agriculture, is the primary component of the Virginia ConservationVision Agricultural Model. It is derived from data extracted from gSSURGO data provided by the Natural Resources Conservation Service (NRCS). The Soil Quality Score ranges from 0 (unsuitable) to 100 (optimal), and was calculated as the mean of three subscores:

- Farmland Classification Score
- Nonirrigated Capability Class Score
- National Commodity Crop Productivity Index Score

This dataset was created in 2015. For more information, see the technical report.[49] The DCR Soil Quality Model was downloaded from the Virginia Department of Conservation and Recreation Division of Natural Heritage website.[50] The data was downloaded as a TIF file. All data were projected to Virginia Lambert Conformal Conic NAD 1983.

The Model was a classified TIF with values ranging from 0 to 100. The data were brought into ArcGIS Pro and reclassified using the Spatial Analyst Reclassify tool. Class breaks were set using the VA DCR-DNH Model breaks:

- Class V = value 81-100 high suitability
- Class IV = value 61-80
- Class III = value 41-60
- Class II = value 21-40
- Class 1 = value 0 - 20 low suitability

Data was then converted from raster to a polygon feature class, with no simplification to retain the feature shape. Conversion to vector allows for use of the geoprocessing tools and provides more discrete calculations versus raster.

Statewide Area Calculations

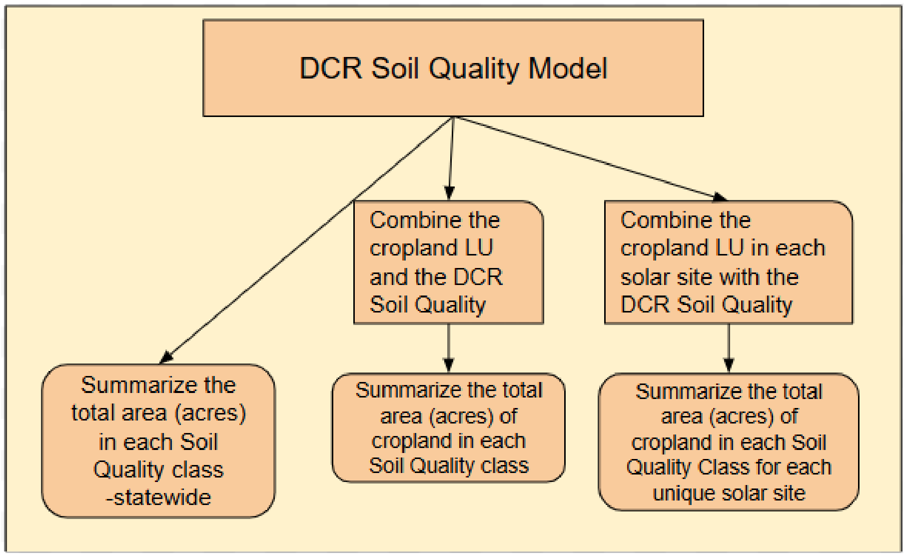
In ArcGIS Pro, Summary Statistics was used to calculate the total area of each Model class in the state. Values were converted to acres, and exported to an excel spreadsheet.

[49] Virginia Department of Conservation and Recreation (2015). Virginia ConservationVision: Agricultural Model 2015 Edition.

[50] ESRI (2015). Virginia Agricultural Model, 2015 edition: Soil Quality Score (TIF).

Solar Site Cropland Soil Quality Model Area

To calculate the total area of the cropland soil quality classes within each solar site, the Intersect Tool was used to overlay the soil quality model with cropland and the solar sites. This computes the geometric intersection of all three layers. Summary statistics was used to calculate the total area of cropland soil quality model classes in each unique solar site. Values were converted to acres, and exported to an excel spreadsheet. A Pivot table was used to format the table.

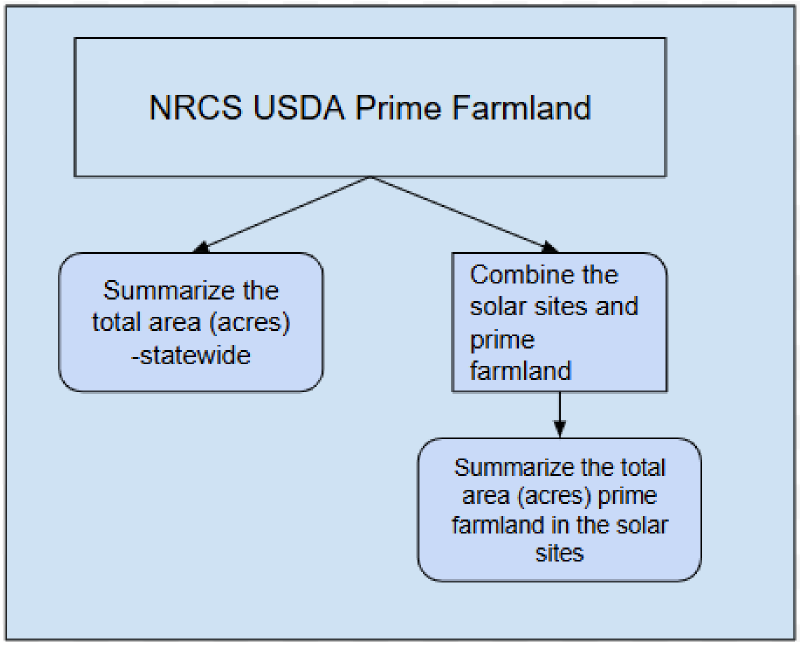


Prime Farmland

The USA SSURGO Farmland Class feature layer was used to quantify the total prime farmland area in Virginia and contained within the delineated solar sites. "The Farmland Protection Policy Act, part of the 1981 Farm Bill, is intended to limit federal activities that contribute to the unnecessary conversion of farmland to other uses. The law applies to construction projects funded by the federal government such as highways, airports, and dams, and to the management of federal lands. As part of the implementation of this law, the Natural Resources Conservation Service identifies high quality agricultural soils as prime farmland, unique farmland, and land of statewide or local importance. Each category may contain one or more limitations such as Prime Farmland if Irrigated. For more information of farmland classification see the National Soil Survey Handbook".

The SSURGO feature service was added to ArcGIS Pro. The data was extracted to Virginia using the Spatial Analyst Extract by Mask function. The data was projected to Virginia Lambert Conformal Conic NAD 1983. The raster was converted to a vector using the Data Conversion Raster to Polygon tool. The polygons were not simplified. Prime farmland was selected out using 'all areas are prime farmland' = 1 into a prime farmland feature class. An ACRES field was added and calculated.

Summary statistics was used to find the total area of prime farmland in Virginia. The Intersect Tool was used to overlay the prime farmland feature class and the solar footprints. Summary statistics was used to calculate the total area of prime farmland contained within the solar sites in Virginia and reported out in the Overall Statistics table.


NRCS USDA Prime Farmland
Summarize the total area (acres) -statewide
Combine the solar sites and prime farmland
Summarize the total area (acres) prime farmland in the solar sites

Appendix B. Final Data Tables

Table B.1. Locations and Characteristics of Utility-Scale Solar Projects in Virginia

ID	Name	Nameplate MW (AC)	County	Lat	Long	State Permit	Service Date	POI Voltage
101	Eastern Shore	80	Accomack	37.94	-75.57	PBR	2016-10	138 kV
102	Scott I	17	Powhatan	37.52	-77.93	CPCN	2016-12	34.5 kV
103	Woodland	19	Isle of Wight	36.89	-76.61	CPCN	2016-12	34.5 kV
104	Whitehouse	20	Louisa	38.02	-77.97	CPCN	2016-12	34.5 kV
105	Clarke	10	Clarke	39.06	-78.14	PBR	2017-08	34.5 kV
106	Remington	20	Fauquier	38.55	-77.78	CPCN	2017-10	34.5 kV
107	Correctional	20	New Kent	37.47	-76.86	PBR	2017-12	34.5 kV
108	Sappony	20	Sussex	36.94	-77.42	PBR	2017-11	34.5 kV
109	Buckingham I	19.8	Buckingham	37.50	-78.38	PBR	2017-11	34.5 kV
110	Cherrydale	20	Northampton	37.37	-75.91	PBR	2017-11	69 kV
111	Oceana	17.6	Virginia Beach City	36.79	-76.05	CPCN	2017-12	34.5 kV
112	Scott II	20	Powhatan	37.52	-77.93	PBR	2017-12	34.5 kV
113	Essex	20	Essex	37.83	-76.80	PBR	2017-12	34.5 kV
114	Southampton	100	Southampton	36.61	-77.17	PBR	2017-12	115 kV
115	Palmer	5	Fluvanna	37.97	-78.23	Sec. 130	2017-12	Distribution
116	Martin	5	Goochland	37.88	-78.05	Sec. 130	2017-12	Distribution
117	Kentuck	6	Pittsylvania	36.66	-79.30	Sec. 130	2018-03	Distribution
118	Hollyfield I	17	King William	37.67	-77.17	PBR	2018-09	34.5 kV
119	Puller	15	Middlesex	37.57	-76.47	PBR	2018-10	34.5 kV
120	Montross	20	Westmoreland	38.08	-76.79	PBR	2018-12	34.5 kV
121	Gloucester	19.9	Gloucester	37.45	-76.45	PBR	2019-04	34.5 kV
122	Colonial Trail West	142.4	Surry	37.14	-76.90	CPCN	2019-12	230 kV
123	Rives Road	19.7	Prince George	37.18	-77.34	PBR	2020-05	34.5 kV
124	Myrtle	15	Suffolk City	36.79	-76.67	PBR	2020-06	34.5 kV
125	Pamplin	15.7	Appomattox	37.33	-78.77	PBR	2020-07	34.5 kV
126	Grasshopper	80	Mecklenburg	36.81	-78.45	PBR	2020-09	115 kV
127	Hickory	20	Chesapeake City	36.62	-76.19	PBR	2020-08	34.5 kV
128	Mechanicsville	25	Hanover	37.67	-77.21	PBR	2020-09	34.5 kV
129	Spotsylvania	485	Spotsylvania	38.25	-77.78	CPCN	2020-09	500 kV
130	Irish Road/Whitmell	10	Pittsylvania	36.73	-79.51	Sec. 130	2020-08	Distribution

ID	Name	Nameplate MW (AC)	County	Lat	Long	State Permit	Service Date	POI Voltage
131	Spring Grove I	97.9	Surry	37.14	-76.90	CPCN	2020-10	230 kV
132	Danville	12	Pittsylvania	36.59	-79.30	PBR	2020-11	Distribution
133	Greensville County	80	Greensville	36.64	-77.57	PBR	2020-12	115 kV
134	Twittys Creek	13.8	Charlotte	37.02	-78.58	PBR	2020-12	34.5 kV
135	Gardy's Mill	14	Westmoreland	38.01	-76.61	PBR	2020-12	34.5 kV
136	Briel	20	Henrico	37.53	-77.27	PBR	2021-08	34.5 kV
137	Sadler	100	Greensville	36.69	-77.56	CPCN	2021-07	230 kV
138	Water Strider	80	Halifax	37.02	-79.03	PBR	2021-03	115 kV
139	Bluestone Solar	49.9	Mecklenburg	36.80	-78.49	PBR	2021-05	115 kV
140	Altavista Solar	80	Campbell	37.14	-79.36	PBR	2021-06	138 kV
141	Desper/Belcher Solar	88.2	Louisa	38.02	-78.04	PBR	2021-12	230 kV
142	Mt. Jackson Solar	15.7	Shenandoah	38.74	-78.66	PBR	2021-06	34.5 kV
143	Buckingham II Solar	20	Buckingham	37.51	-78.38	PBR	2021-07	34.5 kV
144	Hollyfield II Solar	13	King William	37.67	-77.17	PBR	2021-07	34.5 kV
145	Fort Powhatan Solar	150	Prince George	37.25	-77.09	PBR	2021-08	230 kV
146	Leatherwood Solar	20	Henry	36.69	-79.71	PBR	2021-08	34.5 kV
147	Westmoreland	19.9	Westmoreland	38.01	-76.75	PBR	2021-10	230 kV
148	Bedford	70	Chesapeake City	36.70	-76.17	PBR	2021-11	230 kV
149	Whitehorn	50	Pittsylvania	36.92	-79.36	PBR	2021-10	69 kV
150	Rochambeau	19.9	James City County	37.36	-76.77	PBR	2021-12	34.5 kV
151	Skipjack	175	Charles City County	37.39	-77.19	CPCN	2022-05	230 kV
152	Grassfield	20	Chesapeake City	36.66	-76.34	CPCN	2022-10	34.5 kV
153	Depot	15	Campbell	37.28	-79.11	PBR	2022-07	12.47 kV
154	Wytheville	20	Wythe	36.96	-81.05	PBR	2022-06	34.5 kV
155	Pumpkinseed	59.6	Greensville	36.60	-77.65	PBR	2022-09	115 kV
156	Stratford	15	Suffolk City	36.69	-76.57	PBR	2022-11	34.5 kV
157	Amelia I	5	Amelia	37.45	-77.95	Sec. 130	2023-12	Distribution
158	Amelia II	5	Amelia	37.46	-77.98	Sec. 130	2023-12	Distribution
159	Red House	5	Charlotte	37.18	-78.81	Sec. 130	2023-12	Distribution
160	Reams	5	Dinwiddie	37.09	-77.48	Sec. 130	2024-08	Distribution
161	Powhatan I	5	Powhatan	37.53	-77.96	Sec. 130	2023-12	Distribution
162	Millboro Springs	5	Bath	38.00	-79.57	Sec. 130	2023-12	Distribution

ID	Name	Nameplate MW (AC)	County	Lat	Long	State Permit	Service Date	POI Voltage
163	Nokesville	20	Prince William	38.67	-77.59	PBR	2022-11	34.5 kV
164	Sycamore	42	Pittsylvania	36.94	-79.22	CPCN	2023-03	69 kV
165	Maplewood	120	Pittsylvania	36.90	-79.49	PBR	2022-12	138 kV
166	Sunnybrook	51	Halifax	36.80	-78.84	PBR	2022-12	115 kV
167	Watlington	20	Halifax	36.68	-78.89	PBR	2023-03	34.5 kV
168	Cunningham	5	Fluvanna	37.89	-78.32	Sec. 130	2023-03	Distribution
169	Solidago	20	Isle of Wight	36.90	-76.71	CPCN	2023-06	34.5 kV
170	Pleasant Hill	20	Suffolk City	36.69	-76.58	PBR	2023-06	34.5 kV
171	Powell's Creek	70	Halifax	36.55	-79.03	PBR	2023-08	230 kV
172	Piney Creek	80	Halifax	36.82	-78.77	CPCN	2023-08	230 kV
173	Norge	20	James City County	37.37	-76.78	CPCN	2023-11	34.5 kV
174	Aditya	11.5	Louisa	38.02	-77.95	PBR	2023-08	Distribution
175	Winterberry	20	Gloucester	37.36	-76.53	CPCN	2024-06	34.5 kV
176	Camelia	20	Gloucester	37.42	-76.48	CPCN	Pending	34.5 kV
177	Chesapeake	118	Chesapeake City	36.69	-76.30	PBR	2023-12	115 kV
178	Fountain Creek	80	Greensville	36.60	-77.67	CPCN	Pending	115 kV
179	Crystal Hill	64.7	Halifax	36.84	-78.94	PBR	2023-12	230 kV
180	Foxhound	83	Halifax	36.87	-78.75	PBR	2024-04	230 kV
181	Otter Creek	60	Mecklenburg	36.81	-78.51	CPCN	2023-10	115 kV
182	Axton	66	Pittsylvania & Henry	36.63	-79.70	PBR	2023-12	138 kV
183	Endless Caverns	31.4	Rockingham	38.61	-78.68	PBR	2023-12	34.5 kV
184	Apple Grove	18.6	Louisa	37.92	-77.86	PBR	2023-12	34.5 kV
185	Waverly	118	Sussex	37.02	-77.12	PBR	2023-12	115 kV
186	Cavalier	240	Surry & Isle of Wight	37.04	-76.79	CPCN	Pending	500 kV
187	Quilwort	18	Powhatan	37.57	-77.92	CPCN	Pending	34.5 kV
188	Bookers Mill	127	Richmond	37.86	-76.56	PBR	Pending	115 kV
189	White Stone Ocran	5	Lancaster	37.66	-76.38	Sec. 130	2024-02	Distribution
190	Sebera	18	Prince George	37.23	-77.24	CPCN	Pending	34.5 kV
191	Bartonsville	130	Frederick	39.08	-78.25	PBR	Pending	138 kV
192	Fairfield Lee	5	Rockbridge	37.88	-79.30	Sec. 130	2024-05	Distribution
193	Waynesboro Bridge	5	Augusta	38.10	-78.92	Sec. 130	2024-04	Distribution
194	Madison	62.5	Orange	38.29	-77.84	PBR	2024-09	115 kV

Table B.2. Disturbed Acreage of Utility-Scale Solar Projects in Virginia

ID	Name	Nameplate MW (AC)	County	Disturbed Acreage	Disturbed Acres / MW
101	Eastern Shore	80	Accomack	613.62	7.67
102	Scott I	17	Powhatan	187.43	11.03
103	Woodland	19	Isle of Wight	145.64	7.67
104	Whitehouse	20	Louisa	154.92	7.75
105	Clarke	10	Clarke	87.11	8.71
106	Remington	20	Fauquier	114.64	5.73
107	Correctional	20	New Kent	143.39	7.17
108	Sappony	20	Sussex	142.36	7.12
109	Buckingham I	19.8	Buckingham	116.69	5.89
110	Cherrydale	20	Northampton	152.44	7.62
111	Oceana	17.6	Virginia Beach City	96.25	5.47
112	Scott II	20	Powhatan	127.31	6.37
113	Essex	20	Essex	174.82	8.74
114	Southampton	100	Southampton	813.83	8.14
115	Palmer	5	Fluvanna	40.15	8.03
116	Martin	5	Goochland	29.22	5.84
117	Kentuck	6	Pittsylvania	57.69	9.61
118	Hollyfield I	17	King William	134.14	7.89
119	Puller	15	Middlesex	114.49	7.63
120	Montross	20	Westmoreland	106.40	5.32
121	Gloucester	19.9	Gloucester	133.29	6.70
122	Colonial Trail West	142.4	Surry	1130.96	7.94
123	Rives Road	19.7	Prince George	98.36	4.99
124	Myrtle	15	Suffolk City	93.78	6.25
125	Pamplin	15.7	Appomattox	100.24	6.38
126	Grasshopper	80	Mecklenburg	622.92	7.79
127	Hickory	20	Chesapeake City	150.94	7.55
128	Mechanicsville	25	Hanover	166.42	6.66
129	Spotsylvania	485	Spotsylvania	3518.93	7.26
130	Irish Road/Whitmell	10	Pittsylvania	83.81	8.38

ID	Name	Nameplate MW (AC)	County	Disturbed Acreage	Disturbed Acres / MW
131	Spring Grove I	97.9	Surry	685.22	7.00
132	Danville	12	Pittsylvania	83.32	6.94
133	Greensville County	80	Greensville	440.21	5.50
134	Twittys Creek	13.8	Charlotte	82.68	5.99
135	Gardy's Mill	14	Westmoreland	87.92	6.28
136	Briel	20	Henrico	156.96	7.85
137	Sadler	100	Greensville	817.68	8.18
138	Water Strider	80	Halifax	650.37	8.13
139	Bluestone Solar	49.9	Mecklenburg	298.86	5.99
140	Altavista Solar	80	Campbell	554.41	6.93
141	Desper/Belcher Solar	88.2	Louisa	687.86	7.80
142	Mt. Jackson Solar	15.7	Shenandoah	146.48	9.33
143	Buckingham II Solar	20	Buckingham	172.57	8.63
144	Hollyfield II Solar	13	King William	124.60	9.58
145	Fort Powhatan Solar	150	Prince George	1197.89	7.99
146	Leatherwood Solar	20	Henry	171.88	8.59
147	Westmoreland	19.9	Westmoreland	147.93	7.43
148	Bedford	70	Chesapeake City	527.00	7.53
149	Whitehorn	50	Pittsylvania	404.25	8.08
150	Rochambeau	19.9	James City County	143.23	7.20
151	Skipjack	175	Charles City County	1077.39	6.16
152	Grassfield	20	Chesapeake City	168.42	8.42
153	Depot	15	Campbell	110.49	7.37
154	Wytheville	20	Wythe	120.13	6.01
155	Pumpkinseed	59.6	Greensville	368.87	6.19
156	Stratford	15	Suffolk City	91.00	6.07
157	Amelia I	5	Amelia	37.33	7.47
158	Amelia II	5	Amelia	40.57	8.11
159	Red House	5	Charlotte	28.47	5.69
160	Reams	5	Dinwiddie	28.50	5.70
161	Powhatan I	5	Powhatan	29.36	5.87
162	Millboro Springs	5	Bath	23.69	4.74

ID	Name	Nameplate MW (AC)	County	Disturbed Acreage	Disturbed Acres / MW
163	Nokesville	20	Prince William	137.19	6.86
164	Sycamore	42	Pittsylvania	296.58	7.06
165	Maplewood	120	Pittsylvania	853.43	7.11
166	Sunnybrook	51	Halifax	317.07	6.22
167	Watlington	20	Halifax	130.39	6.52
168	Cunningham	5	Fluvanna	31.15	6.23
169	Solidago	20	Isle of Wight	136.31	6.82
170	Pleasant Hill	20	Suffolk City	149.83	7.49
171	Powell's Creek	70	Halifax	514.03	7.34
172	Piney Creek	80	Halifax	502.11	6.28
173	Norge	20	James City County	132.68	6.63
174	Aditya	11.5	Louisa	56.10	4.88
175	Winterberry	20	Gloucester	149.61	7.48
176	Camelia	20	Gloucester	98.07	4.90
177	Chesapeake	118	Chesapeake City	629.49	5.33
178	Fountain Creek	80	Greensville	429.17	5.36
179	Crystal Hill	64.7	Halifax	443.93	6.86
180	Foxhound	83	Halifax	585.74	7.06
181	Otter Creek	60	Mecklenburg	367.99	6.13
182	Axton	66	Pittsylvania & Henry	346.50	5.25
183	Endless Caverns	31.4	Rockingham	173.49	5.53
184	Apple Grove	18.6	Louisa	111.13	5.97
185	Waverly	118	Sussex	732.76	6.21
186	Cavalier	240	Surry & Isle of Wight	1507.93	6.28
187	Quilwort	18	Powhatan	124.58	6.92
188	Bookers Mill	127	Richmond	839.29	6.61
189	White Stone Ocran	5	Lancaster	49.83	9.97
190	Sebera	18	Prince George	87.14	4.84
191	Bartonsville	130	Frederick	938.65	7.22
192	Fairfield Lee	5	Rockbridge	31.46	6.29
193	Waynesboro Bridge	5	Augusta	30.35	6.07
194	Madison	62.5	Orange	340.07	5.44

Table B.3. Land Coverage of Utility-Scale Solar Projects in Virginia (Acres)

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
101	Eastern Shore	0.0	4.9	0.0	15.5	4.3	0.1	5.1	3.0	0.0	580.6	0.1
102	Scott I	0.0	0.2	0.0	156.0	2.2	0.0	26.6	2.4	0.0	0.0	0.0
103	Woodland	0.0	3.6	0.0	1.1	0.9	0.0	1.1	3.1	0.0	135.8	0.0
104	Whitehouse	0.0	0.0	0.0	77.1	1.2	0.0	55.9	0.0	20.6	0.0	0.0
105	Clarke	0.0	0.5	0.0	0.0	1.4	0.0	0.0	0.6	58.8	25.8	0.0
106	Remington	0.0	0.0	0.0	6.9	8.1	0.1	0.0	0.3	11.2	87.4	0.6
107	Correctional	0.0	0.8	0.0	141.9	0.4	0.0	0.0	0.3	0.0	0.0	0.0
108	Sappony	0.0	0.0	0.0	8.8	0.7	0.0	1.8	0.0	0.0	130.9	0.1
109	Buckingham I	0.0	0.0	0.0	73.8	0.8	0.0	32.2	3.1	0.0	6.7	0.0
110	Cherrydale	0.0	0.0	0.0	30.8	0.6	0.0	0.0	1.0	0.0	120.1	0.0
111	Oceana	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.5	0.0	86.3	8.4
112	Scott II	0.0	0.1	0.0	126.9	0.1	0.0	0.0	0.2	0.0	0.0	0.0
113	Essex	0.0	0.2	0.0	60.4	10.3	0.0	0.0	0.7	0.0	103.2	0.0
114	Southampton	0.0	0.8	0.0	71.0	3.4	0.0	29.3	0.0	0.0	709.4	0.0
115	Palmer	0.0	0.3	0.0	4.3	3.2	0.0	0.0	0.0	0.2	32.3	0.0
116	Martin	0.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	1.7	0.0	0.0
117	Kentuck	0.0	0.0	0.0	35.2	1.2	0.0	0.0	1.9	0.0	19.4	0.0
118	Hollyfield I	0.0	0.0	0.0	0.8	0.7	0.0	0.0	1.8	0.0	130.8	0.1
119	Puller	0.0	0.8	0.0	24.8	5.0	0.0	0.0	0.8	0.0	83.1	0.0
120	Montross	0.0	0.8	0.0	1.2	0.1	0.0	0.0	0.6	0.0	103.7	0.0
121	Gloucester	0.0	0.0	0.0	0.1	4.2	0.0	0.0	0.0	0.0	129.0	0.0
122	Colonial Trail West	0.0	0.9	0.0	1044.8	0.7	23.9	48.2	0.3	11.5	0.0	0.6
123	Rives Road	0.0	1.1	0.0	36.3	4.0	0.0	0.0	12.5	0.0	44.2	0.2
124	Myrtle	0.0	0.7	0.0	0.0	0.2	0.0	0.0	0.1	0.0	92.7	0.0
125	Pamplin	0.0	0.0	0.0	100.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0
126	Grasshopper	0.0	0.2	0.0	12.4	28.5	0.0	0.0	0.1	580.1	0.0	1.6
127	Hickory	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150.9	0.0
128	Mechanicsville	0.0	1.5	0.0	0.0	2.4	0.0	0.0	2.3	0.0	160.3	0.0
129	Spotsylvania	0.0	1.2	0.0	3212.3	9.5	26.3	139.8	7.5	97.6	0.0	24.7
130	Irish Road/Whitmell	0.0	0.3	0.0	30.7	0.4	0.0	0.0	2.1	0.0	50.2	0.0

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
131	Spring Grove I	0.0	0.9	0.0	532.1	0.4	30.8	111.5	0.9	0.0	3.0	5.6
132	Danville	0.0	0.0	0.0	1.2	17.5	0.0	0.0	64.7	0.0	0.0	0.0
133	Greensville County	0.0	1.5	0.0	143.3	0.8	1.4	34.6	2.0	5.7	249.9	0.9
134	Twittys Creek	0.0	0.4	0.0	74.4	2.1	1.9	0.0	3.6	0.0	0.0	0.2
135	Gardy's Mill	0.0	0.4	0.0	33.6	0.8	0.0	0.0	2.6	0.0	50.5	0.0
136	Briel	0.0	1.0	0.0	21.0	11.6	0.0	0.0	4.6	19.9	97.0	1.9
137	Sadler	0.0	0.6	0.0	752.4	0.3	0.1	52.4	0.0	7.3	0.0	4.6
138	Water Strider	0.0	0.0	0.0	503.1	0.5	0.0	140.3	1.0	5.5	0.0	0.0
139	Bluestone Solar	0.0	0.4	0.0	205.0	18.9	19.1	0.0	0.0	54.9	0.0	0.5
140	Altavista Solar	0.0	0.5	0.0	119.4	33.6	14.5	0.0	0.2	386.2	0.0	0.0
141	Desper/Belcher Solar	0.0	0.0	0.0	227.3	0.9	2.8	456.1	0.6	0.0	0.0	0.0
142	Mt. Jackson Solar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	146.5	0.0
143	Buckingham II Solar	0.0	0.0	0.0	75.0	4.7	0.0	0.0	0.1	4.3	88.6	0.0
144	Hollyfield II Solar	0.0	0.0	0.0	1.4	0.3	0.0	0.0	2.7	0.0	120.2	0.0
145	Fort Powhatan Solar	0.0	6.8	0.0	1054.6	19.9	5.4	0.0	19.5	0.0	88.7	3.0
146	Leatherwood Solar	0.0	0.1	0.0	2.0	5.3	0.0	25.7	0.3	138.5	0.0	0.0
147	Westmoreland	0.0	0.0	0.0	43.1	0.4	0.0	0.0	0.8	0.0	103.7	0.0
148	Bedford	0.0	5.1	0.0	1.0	4.5	0.0	0.0	2.0	0.0	514.4	0.0
149	Whitehorn	0.0	0.7	0.0	43.2	1.9	0.0	0.0	0.0	162.4	196.0	0.0
150	Rochambeau	0.0	0.0	0.0	60.1	0.0	0.0	24.1	1.3	0.0	57.6	0.0
151	Skipjack	0.0	5.1	0.0	818.9	45.9	0.0	172.0	33.3	0.0	0.0	2.3
152	Grassfield	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	168.2	0.0
153	Depot	0.0	0.1	0.0	14.3	1.9	0.0	19.0	0.5	74.8	0.0	0.0
154	Wytheville	0.0	0.4	0.0	17.3	12.9	4.6	0.0	0.6	38.2	46.0	0.0
155	Pumpkinseed	0.0	1.3	0.0	186.1	6.7	1.1	38.2	0.7	0.0	134.7	0.1
156	Stratford	0.0	3.0	0.0	0.0	0.9	0.0	0.0	0.9	0.0	86.3	0.0
157	Amelia I	0.0	0.0	0.0	2.1	2.9	0.0	0.0	0.0	32.3	0.0	0.0
158	Amelia II	0.0	0.0	0.0	36.6	0.0	0.0	0.0	0.0	3.3	0.0	0.7
159	Red House	0.0	0.0	0.0	19.8	0.1	0.0	0.0	0.0	8.3	0.0	0.3
160	Reams	0.0	0.9	0.0	3.3	4.6	0.0	0.0	2.6	1.7	15.3	0.0
161	Powhatan I	0.0	0.0	0.0	29.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162	Millboro Springs	0.0	0.1	0.0	0.6	0.5	0.0	0.0	0.1	22.0	0.0	0.4

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
163	Nokesville	0.1	0.1	0.0	45.5	9.9	0.2	0.0	0.0	78.5	0.0	2.9
164	Sycamore	0.1	0.0	0.0	88.4	3.8	0.0	96.9	0.0	91.3	16.0	0.0
165	Maplewood	0.0	0.2	0.0	93.3	26.2	0.0	71.8	1.4	319.4	339.9	1.3
166	Sunnybrook	1.6	3.2	0.0	25.7	40.7	2.8	0.0	1.7	241.4	0.0	0.0
167	Watlington	0.0	1.2	0.0	94.8	2.5	0.7	12.4	0.1	18.7	0.0	0.0
168	Cunningham	0.0	0.2	0.0	24.0	0.6	0.0	0.0	1.7	4.7	0.0	0.0
169	Solidago	0.0	0.6	0.0	1.1	1.0	0.0	0.0	1.7	0.0	132.0	0.0
170	Pleasant Hill	0.0	0.1	0.0	0.8	0.3	0.0	0.0	0.5	0.0	147.1	1.0
171	Powell's Creek	0.0	0.3	0.0	486.9	0.3	13.4	0.0	0.6	10.4	0.0	2.2
172	Piney Creek	0.0	0.4	0.0	363.3	0.7	118.2	18.3	0.5	0.0	0.0	0.7
173	Norge	0.0	1.9	0.0	41.4	3.0	0.0	0.0	4.6	0.0	81.8	0.0
174	Aditya	0.0	0.0	0.0	56.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175	Winterberry	0.0	1.3	0.0	49.0	5.5	0.1	0.0	0.8	4.3	87.7	1.0
176	Camelia	0.0	1.1	0.0	0.1	2.2	0.0	0.0	0.0	0.0	94.7	0.0
177	Chesapeake	0.0	1.4	0.0	0.0	0.3	0.0	0.0	0.0	0.4	626.8	0.4
178	Fountain Creek	0.0	0.3	0.0	283.3	2.5	0.0	0.0	0.0	0.0	142.9	0.1
179	Crystal Hill	0.0	0.0	0.0	359.1	0.0	1.5	80.6	0.0	0.0	0.0	2.7
180	Foxhound	0.0	1.7	0.0	397.4	14.9	1.4	0.0	1.5	112.6	56.2	0.0
181	Otter Creek	0.0	0.1	0.0	194.5	3.8	0.0	97.0	0.0	71.5	0.0	1.1
182	Axton	0.0	0.2	0.0	289.2	0.3	56.8	0.0	0.1	0.0	0.0	0.0
183	Endless Caverns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	173.4	0.0	0.0
184	Apple Grove	0.0	0.0	0.0	92.4	1.2	0.0	0.0	0.1	0.0	17.4	0.0
185	Waverly	0.0	1.5	0.0	583.9	4.2	2.8	111.4	0.2	0.0	27.4	1.3
186	Cavalier	0.0	4.1	3.0	310.7	11.9	0.0	308.9	8.3	44.0	749.8	67.2
187	Quilwort	0.0	0.3	0.0	122.2	1.0	0.1	0.0	0.9	0.0	0.0	0.0
188	Bookers Mill	0.0	1.0	0.0	778.3	4.7	5.0	46.3	4.0	0.0	0.0	0.0
189	White Stone Ocran	0.0	0.0	0.0	2.1	0.3	0.0	0.2	0.0	0.0	47.1	0.0
190	Sebera	0.0	0.6	0.0	63.1	1.8	0.0	0.0	2.4	0.0	19.2	0.0
191	Bartonsville	0.0	6.9	0.0	133.8	57.5	0.0	0.0	2.9	90.8	646.7	0.0
192	Fairfield Lee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.5	0.0
193	Waynesboro Bridge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	19.5	0.0
194	Madison	0.0	1.6	0.0	89.6	21.7	0.0	0.0	0.6	226.6	0.0	0.0

Table B.4. Land Coverage of Utility-Scale Solar Projects in Virginia (Percent)

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
101	Eastern Shore	0%	1%	0%	3%	1%	0%	1%	0%	0%	95%	0%
102	Scott I	0%	0%	0%	83%	1%	0%	14%	1%	0%	0%	0%
103	Woodland	0%	2%	0%	1%	1%	0%	1%	2%	0%	93%	0%
104	Whitehouse	0%	0%	0%	50%	1%	0%	36%	0%	13%	0%	0%
105	Clarke	0%	1%	0%	0%	2%	0%	0%	1%	68%	30%	0%
106	Remington	0%	0%	0%	6%	7%	0%	0%	0%	10%	76%	0%
107	Correctional	0%	1%	0%	99%	0%	0%	0%	0%	0%	0%	0%
108	Sappony	0%	0%	0%	6%	1%	0%	1%	0%	0%	92%	0%
109	Buckingham I	0%	0%	0%	63%	1%	0%	28%	3%	0%	6%	0%
110	Cherrydale	0%	0%	0%	20%	0%	0%	0%	1%	0%	79%	0%
111	Oceana	0%	0%	0%	1%	0%	0%	0%	1%	0%	90%	9%
112	Scott II	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
113	Essex	0%	0%	0%	35%	6%	0%	0%	0%	0%	59%	0%
114	Southampton	0%	0%	0%	9%	0%	0%	4%	0%	0%	87%	0%
115	Palmer	0%	1%	0%	11%	8%	0%	0%	0%	0%	80%	0%
116	Martin	0%	0%	0%	94%	0%	0%	0%	0%	6%	0%	0%
117	Kentuck	0%	0%	0%	61%	2%	0%	0%	3%	0%	34%	0%
118	Hollyfield I	0%	0%	0%	1%	1%	0%	0%	1%	0%	97%	0%
119	Puller	0%	1%	0%	22%	4%	0%	0%	1%	0%	73%	0%
120	Montross	0%	1%	0%	1%	0%	0%	0%	1%	0%	97%	0%
121	Gloucester	0%	0%	0%	0%	3%	0%	0%	0%	0%	97%	0%
122	Colonial Trail West	0%	0%	0%	92%	0%	2%	4%	0%	1%	0%	0%
123	Rives Road	0%	1%	0%	37%	4%	0%	0%	13%	0%	45%	0%
124	Myrtle	0%	1%	0%	0%	0%	0%	0%	0%	0%	99%	0%
125	Pamplin	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
126	Grasshopper	0%	0%	0%	2%	5%	0%	0%	0%	93%	0%	0%
127	Hickory	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
128	Mechanicsville	0%	1%	0%	0%	1%	0%	0%	1%	0%	96%	0%
129	Spotsylvania	0%	0%	0%	91%	0%	1%	4%	0%	3%	0%	1%
130	Irish Road/Whitmell	0%	0%	0%	37%	0%	0%	0%	3%	0%	60%	0%

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
131	Spring Grove I	0%	0%	0%	78%	0%	4%	16%	0%	0%	0%	1%
132	Danville	0%	0%	0%	1%	21%	0%	0%	78%	0%	0%	0%
133	Greensville County	0%	0%	0%	33%	0%	0%	8%	0%	1%	57%	0%
134	Twittys Creek	0%	1%	0%	90%	3%	2%	0%	4%	0%	0%	0%
135	Gardy's Mill	0%	0%	0%	38%	1%	0%	0%	3%	0%	57%	0%
136	Briel	0%	1%	0%	13%	7%	0%	0%	3%	13%	62%	1%
137	Sadler	0%	0%	0%	92%	0%	0%	6%	0%	1%	0%	1%
138	Water Strider	0%	0%	0%	77%	0%	0%	22%	0%	1%	0%	0%
139	Bluestone Solar	0%	0%	0%	69%	6%	6%	0%	0%	18%	0%	0%
140	Altavista Solar	0%	0%	0%	22%	6%	3%	0%	0%	70%	0%	0%
141	Desper/Belcher Solar	0%	0%	0%	33%	0%	0%	66%	0%	0%	0%	0%
142	Mt. Jackson Solar	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
143	Buckingham II Solar	0%	0%	0%	43%	3%	0%	0%	0%	2%	51%	0%
144	Hollyfield II Solar	0%	0%	0%	1%	0%	0%	0%	2%	0%	96%	0%
145	Fort Powhatan Solar	0%	1%	0%	88%	2%	0%	0%	2%	0%	7%	0%
146	Leatherwood Solar	0%	0%	0%	1%	3%	0%	15%	0%	81%	0%	0%
147	Westmoreland	0%	0%	0%	29%	0%	0%	0%	1%	0%	70%	0%
148	Bedford	0%	1%	0%	0%	1%	0%	0%	0%	0%	98%	0%
149	Whitehorn	0%	0%	0%	11%	0%	0%	0%	0%	40%	48%	0%
150	Rochambeau	0%	0%	0%	42%	0%	0%	17%	1%	0%	40%	0%
151	Skipjack	0%	0%	0%	76%	4%	0%	16%	3%	0%	0%	0%
152	Grassfield	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
153	Depot	0%	0%	0%	13%	2%	0%	17%	0%	68%	0%	0%
154	Wytheville	0%	0%	0%	14%	11%	4%	0%	0%	32%	38%	0%
155	Pumpkinseed	0%	0%	0%	50%	2%	0%	10%	0%	0%	37%	0%
156	Stratford	0%	3%	0%	0%	1%	0%	0%	1%	0%	95%	0%
157	Amelia I	0%	0%	0%	6%	8%	0%	0%	0%	87%	0%	0%
158	Amelia II	0%	0%	0%	90%	0%	0%	0%	0%	8%	0%	2%
159	Red House	0%	0%	0%	70%	0%	0%	0%	0%	29%	0%	1%
160	Reams	0%	3%	0%	12%	16%	0%	0%	9%	6%	54%	0%
161	Powhatan I	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
162	Millboro Springs	0%	1%	0%	2%	2%	0%	0%	1%	93%	0%	2%

ID	Name	Open Water	Imperv-ious	Barren	Forest	Tree	Shrub / Scrub	Harvested / Disturbed	Turf / Grass	Pasture	Crop-land	NWI / Other
163	Nokesville	0%	0%	0%	33%	7%	0%	0%	0%	57%	0%	2%
164	Sycamore	0%	0%	0%	30%	1%	0%	33%	0%	31%	5%	0%
165	Maplewood	0%	0%	0%	11%	3%	0%	8%	0%	37%	40%	0%
166	Sunnybrook	0%	1%	0%	8%	13%	1%	0%	1%	76%	0%	0%
167	Watlington	0%	1%	0%	73%	2%	1%	9%	0%	14%	0%	0%
168	Cunningham	0%	0%	0%	77%	2%	0%	0%	5%	15%	0%	0%
169	Solidago	0%	0%	0%	1%	1%	0%	0%	1%	0%	97%	0%
170	Pleasant Hill	0%	0%	0%	1%	0%	0%	0%	0%	0%	98%	1%
171	Powell's Creek	0%	0%	0%	95%	0%	3%	0%	0%	2%	0%	0%
172	Piney Creek	0%	0%	0%	72%	0%	24%	4%	0%	0%	0%	0%
173	Norge	0%	1%	0%	31%	2%	0%	0%	3%	0%	62%	0%
174	Aditya	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
175	Winterberry	0%	1%	0%	33%	4%	0%	0%	1%	3%	59%	1%
176	Camelia	0%	1%	0%	0%	2%	0%	0%	0%	0%	97%	0%
177	Chesapeake	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
178	Fountain Creek	0%	0%	0%	66%	1%	0%	0%	0%	0%	33%	0%
179	Crystal Hill	0%	0%	0%	81%	0%	0%	18%	0%	0%	0%	1%
180	Foxhound	0%	0%	0%	68%	3%	0%	0%	0%	19%	10%	0%
181	Otter Creek	0%	0%	0%	53%	1%	0%	26%	0%	19%	0%	0%
182	Axton	0%	0%	0%	83%	0%	16%	0%	0%	0%	0%	0%
183	Endless Caverns	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
184	Apple Grove	0%	0%	0%	83%	1%	0%	0%	0%	0%	16%	0%
185	Waverly	0%	0%	0%	80%	1%	0%	15%	0%	0%	4%	0%
186	Cavalier	0%	0%	0%	21%	1%	0%	20%	1%	3%	50%	4%
187	Quilwort	0%	0%	0%	98%	1%	0%	0%	1%	0%	0%	0%
188	Bookers Mill	0%	0%	0%	93%	1%	1%	6%	0%	0%	0%	0%
189	White Stone Ocran	0%	0%	0%	4%	1%	0%	1%	0%	0%	95%	0%
190	Sebera	0%	1%	0%	72%	2%	0%	0%	3%	0%	22%	0%
191	Bartonsville	0%	1%	0%	14%	6%	0%	0%	0%	10%	69%	0%
192	Fairfield Lee	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
193	Waynesboro Bridge	0%	0%	0%	0%	0%	0%	0%	0%	36%	64%	0%
194	Madison	0%	0%	0%	26%	6%	0%	0%	0%	67%	0%	0%

Table B.5. Forest Conservation Values (FCV) of Forest Land Cover at Utility-Scale Solar Projects in VA

ID	Name	Disturbed Acreage	Total FCV Acres	Average	Moderate	High	Very High	Outstanding
101	Eastern Shore	613.62	15.23	14.89	0.33	0.00	0.00	0.00
102	Scott I	187.43	156.02	0.00	0.00	0.00	115.68	40.33
103	Woodland	145.64	1.05	0.00	0.00	0.15	0.67	0.23
104	Whitehouse	154.92	77.13	0.02	0.00	22.12	43.15	11.84
105	Clarke	87.11	0.00	0.00	0.00	0.00	0.00	0.00
106	Remington	114.64	3.29	0.55	0.22	1.64	0.88	0.00
107	Correctional	143.39	138.98	75.59	53.69	9.55	0.14	0.00
108	Sappony	142.36	6.73	3.55	0.54	1.67	0.97	0.00
109	Buckingham I	116.69	65.43	0.48	18.80	39.85	6.30	0.00
110	Cherrydale	152.44	26.96	13.90	11.40	1.66	0.00	0.00
111	Oceana	96.25	0.00	0.00	0.00	0.00	0.00	0.00
112	Scott II	127.31	126.56	0.00	0.00	0.33	61.06	65.17
113	Essex	174.82	42.26	32.99	9.28	0.00	0.00	0.00
114	Southampton	813.83	38.81	28.25	9.97	0.59	0.00	0.00
115	Palmer	40.15	2.42	1.98	0.44	0.00	0.00	0.00
116	Martin	29.22	24.65	0.62	0.04	1.89	0.67	21.42
117	Kentuck	57.69	33.28	6.04	25.84	1.40	0.00	0.00
118	Hollyfield I	134.14	0.12	0.00	0.06	0.06	0.00	0.00
119	Puller	114.49	22.93	0.17	6.49	15.76	0.50	0.00
120	Montross	106.40	0.54	0.36	0.19	0.00	0.00	0.00
121	Gloucester	133.29	0.00	0.00	0.00	0.00	0.00	0.00
122	Colonial Trail West	1130.96	996.38	470.27	393.24	126.16	6.72	0.00
123	Rives Road	98.36	33.47	27.54	5.93	0.00	0.00	0.00
124	Myrtle	93.78	0.01	0.01	0.00	0.00	0.00	0.00
125	Pamplin	100.24	99.35	39.29	49.50	10.56	0.00	0.00
126	Grasshopper	622.92	9.51	3.74	3.53	2.10	0.14	0.00
127	Hickory	150.94	0.00	0.00	0.00	0.00	0.00	0.00
128	Mechanicsville	166.42	0.00	0.00	0.00	0.00	0.00	0.00
129	Spotsylvania	3518.93	3,087.43	447.07	775.02	1,016.32	694.87	154.16
130	Irish Road/Whitmell	83.81	1.74	1.74	0.00	0.00	0.00	0.00

ID	Name	Disturbed Acreage	Total FCV Acres	Average	Moderate	High	Very High	Outstanding
131	Spring Grove I	685.22	499.34	254.71	200.44	39.19	4.99	0.00
132	Danville	83.32	0.14	0.00	0.02	0.12	0.00	0.00
133	Greensville County	440.21	130.86	53.66	60.34	16.72	0.14	0.00
134	Twittys Creek	82.68	73.56	44.18	25.66	3.31	0.42	0.00
135	Gardy's Mill	87.92	25.58	3.40	14.91	7.27	0.00	0.00
136	Briel	156.96	13.09	2.36	9.91	0.82	0.00	0.00
137	Sadler	817.68	680.07	112.53	326.44	215.99	25.11	0.00
138	Water Strider	650.37	476.25	29.25	141.93	273.38	31.69	0.00
139	Bluestone Solar	298.86	201.24	148.16	50.47	2.60	0.00	0.00
140	Altavista Solar	554.41	75.23	67.70	7.53	0.00	0.00	0.00
141	Desper/Belcher Solar	687.86	204.50	9.16	132.61	57.05	5.68	0.00
142	Mt. Jackson Solar	146.48	0.00	0.00	0.00	0.00	0.00	0.00
143	Buckingham II Solar	172.57	73.63	0.13	9.43	7.16	6.36	50.54
144	Hollyfield II Solar	124.60	0.54	0.00	0.00	0.15	0.40	0.00
145	Fort Powhatan Solar	1197.89	1,017.58	5.44	111.84	253.85	309.76	336.69
146	Leatherwood Solar	171.88	1.58	0.01	1.52	0.05	0.00	0.00
147	Westmoreland	147.93	36.75	0.52	3.33	17.69	13.67	1.54
148	Bedford	527.00	0.87	0.86	0.00	0.00	0.00	0.00
149	Whitehorn	404.25	36.61	33.24	3.37	0.00	0.00	0.00
150	Rochambeau	143.23	59.13	10.96	40.08	3.79	4.24	0.06
151	Skipjack	1077.39	745.88	144.47	187.05	177.56	175.44	61.38
152	Grassfield	168.42	0.06	0.00	0.00	0.00	0.04	0.02
153	Depot	110.49	11.21	10.46	0.40	0.00	0.35	0.00
154	Wytheville	120.13	10.80	2.20	6.54	2.06	0.00	0.00
155	Pumpkinseed	368.87	119.72	91.34	27.46	0.92	0.00	0.00
156	Stratford	91.00	0.00	0.00	0.00	0.00	0.00	0.00
157	Amelia I	37.33	1.36	0.00	0.17	0.44	0.36	0.39
158	Amelia II	40.57	36.56	19.20	17.33	0.04	0.00	0.00
159	Red House	28.47	19.37	0.00	5.62	6.54	4.56	2.64
160	Reams	28.50	1.48	1.02	0.46	0.00	0.00	0.00
161	Powhatan I	29.36	1.95	0.00	0.00	1.73	0.23	0.00
162	Millboro Springs	23.69	0.23	0.00	0.00	0.23	0.00	0.00

ID	Name	Disturbed Acreage	Total FCV Acres	Average	Moderate	High	Very High	Outstanding
163	Nokesville	137.19	43.50	0.65	3.18	4.31	31.07	4.28
164	Sycamore	296.58	62.75	54.91	7.84	0.00	0.00	0.00
165	Maplewood	853.43	65.86	61.35	4.50	0.00	0.00	0.00
166	Sunnybrook	317.07	14.08	0.00	4.78	7.67	1.64	0.00
167	Watlington	130.39	87.59	0.00	0.33	25.55	44.41	17.29
168	Cunningham	31.15	20.84	5.56	0.36	7.68	5.67	1.57
169	Solidago	136.31	0.41	0.00	0.01	0.41	0.00	0.00
170	Pleasant Hill	149.83	0.24	0.18	0.01	0.03	0.02	0.00
171	Powell's Creek	514.03	344.74	74.02	174.89	95.26	0.57	0.00
172	Piney Creek	502.11	301.80	195.22	100.62	5.97	0.00	0.00
173	Norge	132.68	34.49	8.72	18.92	6.79	0.06	0.00
174	Aditya	56.10	56.10	0.00	7.81	21.93	21.08	5.28
175	Winterberry	149.61	42.25	42.25	0.00	0.00	0.00	0.00
176	Camelia	98.07	0.00	0.00	0.00	0.00	0.00	0.00
177	Chesapeake	629.49	0.01	0.00	0.00	0.01	0.00	0.00
178	Fountain Creek	429.17	253.80	97.53	127.77	27.45	1.05	0.00
179	Crystal Hill	443.93	307.64	10.86	104.36	151.62	40.79	0.02
180	Foxhound	585.74	350.00	4.91	42.65	89.62	177.86	34.96
181	Otter Creek	367.99	178.08	119.30	54.60	4.19	0.00	0.00
182	Axton	346.50	280.61	98.80	173.07	8.75	0.00	0.00
183	Endless Caverns	173.49	0.00	0.00	0.00	0.00	0.00	0.00
184	Apple Grove	111.13	90.57	0.00	0.15	0.58	79.05	10.79
185	Waverly	732.76	544.73	94.54	144.73	206.25	95.81	3.40
186	Cavalier	1507.93	229.38	27.23	101.26	86.53	14.11	0.25
187	Quilwort	124.58	122.22	0.37	0.86	62.86	58.13	0.00
188	Bookers Mill	839.29	612.15	98.14	313.66	194.25	6.07	0.03
189	White Stone Ocran	49.83	0.96	0.09	0.87	0.00	0.00	0.00
190	Sebera	87.14	57.98	35.36	17.66	3.58	1.38	0.00
191	Bartonsville	938.65	104.71	102.35	2.36	0.00	0.00	0.00
192	Fairfield Lee	31.46	0.00	0.00	0.00	0.00	0.00	0.00
193	Waynesboro Bridge	30.35	0.00	0.00	0.00	0.00	0.00	0.00
194	Madison	340.07	78.58	4.23	16.79	38.33	19.23	0.00

Table B.6. Agricultural Soil Values (ASV) of Cropland Cover at Utility-Scale Solar Projects in Virginia

ID	Name	Disturbed Acreage	Total ASV Acres	Class I	Class II	Class III	Class IV	Class V
101	Eastern Shore	613.62	580.60	0.81	0.00	103.87	170.52	305.39
102	Scott I	187.43	0.00	0.00	0.00	0.00	0.00	0.00
103	Woodland	145.64	135.82	4.80	21.94	43.35	34.45	31.29
104	Whitehouse	154.92	0.00	0.00	0.00	0.00	0.00	0.00
105	Clarke	87.11	25.81	0.00	14.62	4.91	6.11	0.17
106	Remington	114.64	87.41	0.00	16.95	2.58	67.89	0.00
107	Correctional	143.39	0.00	0.00	0.00	0.00	0.00	0.00
108	Sappony	142.36	130.90	0.00	0.00	7.06	0.00	123.84
109	Buckingham I	116.69	6.74	0.00	0.00	0.00	1.00	5.74
110	Cherrydale	152.44	120.07	0.00	0.00	0.00	1.78	118.29
111	Oceana	96.25	86.25	0.00	0.00	0.00	86.25	0.00
112	Scott II	127.31	0.00	0.00	0.00	0.00	0.00	0.00
113	Essex	174.82	103.18	0.92	0.00	0.00	4.06	98.21
114	Southampton	813.83	709.38	0.00	7.36	97.95	9.59	594.48
115	Palmer	40.15	32.27	0.00	0.00	0.00	32.27	0.00
116	Martin	29.22	0.00	0.00	0.00	0.00	0.00	0.00
117	Kentuck	57.69	19.37	0.00	0.00	0.00	13.49	5.88
118	Hollyfield I	134.14	130.75	0.00	0.00	17.04	5.86	107.86
119	Puller	114.49	83.11	0.00	0.00	0.00	0.99	82.11
120	Montross	106.40	103.67	1.04	0.00	0.47	0.47	101.69
121	Gloucester	133.29	129.00	0.00	0.00	16.33	110.32	2.35
122	Colonial Trail West	1130.96	0.00	0.00	0.00	0.00	0.00	0.00
123	Rives Road	98.36	44.24	0.00	0.00	0.00	18.35	25.89
124	Myrtle	93.78	92.69	0.00	2.95	0.85	88.89	0.00
125	Pamplin	100.24	0.00	0.00	0.00	0.00	0.00	0.00
126	Grasshopper	622.92	0.00	0.00	0.00	0.00	0.00	0.00
127	Hickory	150.94	150.94	0.00	0.00	150.94	0.00	0.00
128	Mechanicsville	166.42	160.26	0.44	18.76	5.11	0.00	135.95
129	Spotsylvania	3518.93	0.00	0.00	0.00	0.00	0.00	0.00
130	Irish Road/Whitmell	83.81	50.24	0.00	0.00	0.00	1.30	48.94

ID	Name	Disturbed Acreage	Total ASV Acres	Class I	Class II	Class III	Class IV	Class V
131	Spring Grove I	685.22	3.04	0.00	0.00	0.42	0.52	2.10
132	Danville	83.32	0.00	0.00	0.00	0.00	0.00	0.00
133	Greensville County	440.21	249.89	0.00	7.94	18.38	0.43	223.14
134	Twittys Creek	82.68	0.00	0.00	0.00	0.00	0.00	0.00
135	Gardy's Mill	87.92	50.53	0.15	0.00	0.00	0.28	50.09
136	Briel	156.96	96.95	0.00	0.25	0.00	43.07	53.63
137	Sadler	817.68	0.00	0.00	0.00	0.00	0.00	0.00
138	Water Strider	650.37	0.00	0.00	0.00	0.00	0.00	0.00
139	Bluestone Solar	298.86	0.00	0.00	0.00	0.00	0.00	0.00
140	Altavista Solar	554.41	0.00	0.00	0.00	0.00	0.00	0.00
141	Desper/Belcher Solar	687.86	0.00	0.00	0.00	0.00	0.00	0.00
142	Mt. Jackson Solar	146.48	146.46	0.00	1.05	3.54	141.09	0.77
143	Buckingham II Solar	172.57	88.59	0.00	0.00	0.68	17.47	70.44
144	Hollyfield II Solar	124.60	120.19	0.00	0.00	0.00	0.00	120.19
145	Fort Powhatan Solar	1197.89	88.66	0.00	0.00	0.00	35.63	53.03
146	Leatherwood Solar	171.88	0.00	0.00	0.00	0.00	0.00	0.00
147	Westmoreland	147.93	103.66	0.19	0.00	0.00	0.19	103.28
148	Bedford	527.00	514.39	0.00	0.00	453.77	60.55	0.07
149	Whitehorn	404.25	196.02	0.00	0.00	0.00	189.20	6.82
150	Rochambeau	143.23	57.60	0.09	0.03	0.89	31.95	24.64
151	Skipjack	1077.39	0.00	0.00	0.00	0.00	0.00	0.00
152	Grassfield	168.42	168.22	0.00	0.00	33.91	134.31	0.00
153	Depot	110.49	0.00	0.00	0.00	0.00	0.00	0.00
154	Wytheville	120.13	46.05	0.38	3.59	0.00	23.70	18.38
155	Pumpkinseed	368.87	134.69	0.00	12.45	0.00	11.64	110.59
156	Stratford	91.00	86.28	0.00	1.31	41.35	43.62	0.00
157	Amelia I	37.33	0.00	0.00	0.00	0.00	0.00	0.00
158	Amelia II	40.57	0.00	0.00	0.00	0.00	0.00	0.00
159	Red House	28.47	0.00	0.00	0.00	0.00	0.00	0.00
160	Reams	28.50	15.33	0.00	0.00	0.00	0.00	15.33
161	Powhatan I	29.36	0.00	0.00	0.00	0.00	0.00	0.00
162	Millboro Springs	23.69	0.00	0.00	0.00	0.00	0.00	0.00

ID	Name	Disturbed Acreage	Total ASV Acres	Class I	Class II	Class III	Class IV	Class V
163	Nokesville	137.19	0.00	0.00	0.00	0.00	0.00	0.00
164	Sycamore	296.58	15.99	0.00	0.00	0.00	0.16	15.83
165	Maplewood	853.43	339.86	0.00	13.91	0.00	293.21	32.73
166	Sunnybrook	317.07	0.00	0.00	0.00	0.00	0.00	0.00
167	Watlington	130.39	0.00	0.00	0.00	0.00	0.00	0.00
168	Cunningham	31.15	0.00	0.00	0.00	0.00	0.00	0.00
169	Solidago	136.31	131.95	0.00	0.00	108.30	23.30	0.35
170	Pleasant Hill	149.83	147.14	0.00	0.00	0.00	147.14	0.00
171	Powell's Creek	514.03	0.00	0.00	0.00	0.00	0.00	0.00
172	Piney Creek	502.11	0.00	0.00	0.00	0.00	0.00	0.00
173	Norge	132.68	81.83	0.00	0.00	0.00	4.31	77.52
174	Aditya	56.10	0.00	0.00	0.00	0.00	0.00	0.00
175	Winterberry	149.61	87.69	0.00	1.76	0.00	0.89	85.03
176	Camelia	98.07	94.71	0.00	0.00	9.09	79.01	6.61
177	Chesapeake	629.49	626.82	0.00	0.00	625.51	1.31	0.00
178	Fountain Creek	429.17	142.90	0.00	0.01	0.64	0.00	142.25
179	Crystal Hill	443.93	0.00	0.00	0.00	0.00	0.00	0.00
180	Foxhound	585.74	56.17	0.00	1.15	27.28	0.96	26.78
181	Otter Creek	367.99	0.00	0.00	0.00	0.00	0.00	0.00
182	Axton	346.50	0.00	0.00	0.00	0.00	0.00	0.00
183	Endless Caverns	173.49	0.00	0.00	0.00	0.00	0.00	0.00
184	Apple Grove	111.13	17.40	0.00	0.00	0.00	17.40	0.00
185	Waverly	732.76	27.42	0.00	0.00	0.00	0.00	27.42
186	Cavalier	1507.93	749.83	0.00	76.62	130.65	69.65	472.89
187	Quilwort	124.58	0.00	0.00	0.00	0.00	0.00	0.00
188	Bookers Mill	839.29	0.00	0.00	0.00	0.00	0.00	0.00
189	White Stone Ocran	49.83	47.11	0.00	1.88	0.02	24.30	20.90
190	Sebera	87.14	19.23	0.00	0.00	0.00	1.23	18.00
191	Bartonsville	938.65	646.74	3.23	18.28	32.69	151.59	440.93
192	Fairfield Lee	31.46	31.46	0.00	0.00	0.00	11.98	19.48
193	Waynesboro Bridge	30.35	19.48	0.00	0.00	0.00	19.48	0.00
194	Madison	340.07	0.00	0.00	0.00	0.00	0.00	0.00