

Rob Farrell
State Forester



COMMONWEALTH of VIRGINIA

DEPARTMENT OF FORESTRY
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Phone: 434.977.6555 ~ Fax: 434.296.2369

July 25, 2018

Mr. Patrick Carlton White, Planner III
Spotsylvania County Planning Department
9019 Old Battlefield Boulevard Suite 320
Spotsylvania VA 22553

Dear Mr. White:

Thank you for the opportunity to comment on the proposals for the Spotsylvania Solar Energy Center. I have reviewed a number of the documents associated with the application and would like to offer several comments and questions from the Department of Forestry.

1. **Forest Area:** The majority of the proposed locations are historically forested. This forested landscape, has contributed to soil protection, improved water quality, provided income from timber, habitat for wildlife, and carbon storage values. The installation of the facilities will result in the conversion of these forestlands to another use, resulting in the reduction or change of these values. Approximately 3500 acres will be affected (assuming the extent of clearing area), which represents 2.3 percent of the forestland in the county.
2. **Preservation, buffer, and no-build areas:** The various maps and figures show the location of the panels, preservation areas, and several no build areas (portion in Orange County and nearby triangular parcel near the County line) and these comprise about half of the tract acres. There are also areas between the Preservation areas and panels, some narrow, and some of larger size. Will these areas be cleared, or will they be allowed to regenerate with natural vegetation? Are there any management recommendations for the riparian buffer preservation zones?

There is an opportunity for these areas outside of the panel areas to continue to contribute to forest and resource values listed above, through continued use as forest. It is recommended that a forest management plan be prepared for these areas. The plan would be based upon the objectives of the landowner and sound scientific basis of forestry and associated natural resource management. Plans are prepared by professional foresters with input from other resource professionals. The plan would address forest growth and productivity, forest health, and invasive species. VDOF could provide the plan or simply offer input and assistance.

Mission: We Protect and Develop Healthy, Sustainable Forest Resources for Virginians.

Finally, a question of clarification: Are the properties being re-zoned to another zoning? This may determine if any no-build areas are subject to the Virginia Seed Tree Law.

3. ***Perimeter and buffer areas:*** These areas, generally 50 feet in width are noted in various ways, natural regrowth, planting of saplings, landscape trees, or shrubs. As with the other buffer areas above, we would recommend input from forestry and landscape professionals in the management, species selection, site preparation, and planting of these areas. Native species that are adapted to these particular soils and geographic area would likely have a greater likelihood of success. As a particular example, Norway spruce will generally be acceptable (though not widely planted) and grow, but white spruce is seldom planted or seen in the County.
4. ***Decommissioning plan:*** The references in the proposals are fairly general regarding returning to appropriate uses when retired. As the sites were primarily forested, we would strongly suggest consideration be made that they are returned to forest use, and be done so under the guidance of a Forester and a reforestation plan.

Thank you for the opportunity to comment on the proposal. I would be happy to discuss this further with you. My contact information is dean.cumbia@dof.virginia.gov; 434.220.9042.

Sincerely,



Dean Cumbia
Director, Forest Management Branch

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



Rochelle Altholz
Deputy Director of
Administration and Finance

Russell W. Baxter
Deputy Director of
Dam Safety & Floodplain
Management and Soil & Water
Conservation

Thomas L. Smith
Deputy Director of Operations

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE: October 12, 2018

TO: Patrick White, Spotsylvania County Planning Office

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: Spotsylvania Solar Energy Facility, 3rd Review Submittal - SUP18-0001, SUP18-0002, SUP18-0003

Division of Planning and Recreation Resources

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction.

There does not appear to be any detriment to outdoor recreation in the area, nor do the projects provide for needed recreation in the area.

Reviewing from a scenic perspective, there is no direct impact to a Virginia Scenic River or Byway. However, with tourism being one of the top five economic generators in the Commonwealth the retention and provision of natural and scenic assets is a concern with this project. Follow are some questions and comments on these projects. Note that some of the comments may be less of a concern for the smaller sites, but the cumulative impacts of these projects on the rural character of the area are a major concern due to the potential impacts to tourism for the County.

- On page 11 there is reference to an archeological report that was provided by DCR. This is in error since DCR does not manage historic resources. Perhaps it was provided by DHR (Department of Historic Resources)?
- This area is zoned Rural Residential and Agricultural and Forestal Land Use. Are these sites going to be rezoned? Will the impact of converting from agriculture and forest land be taken into account for the whole watershed and not just the immediate ones? Will all the proffers on the sites be abandoned?
- With the concentration of such large numbers of solar panels what will the heat island effect be? Will the planting requirements reflect the increase in temperature?
- In general DCR supports additional buffers throughout all the sites.
- The entrance roads should be aligned in such a fashion that none of the panels are seen from the adjacent public roads. Provide additional planting groups of trees to augment the realignment of the roads as they intersect with the public roadways.

- It seems that the site will be clear-cut and that the proposed buffers will be new plantings. DCR proposes that all buffers be kept in place, except as needed for access, and augmented with additional plantings. This will provide a better screen sooner and allow for healthy forest succession. Planting should be made up of plants similar to the native mixed forests of the area.
- It seems that the plans are for a 200-foot buffer around all the panels of mowed grass. We recommend these areas be left in pollinator grasses to be mowed on a less frequent rotation. Also, in several places the setback is less than 200 feet, does this imply that the setbacks can be reduced? If so limit the amount of mown area and increase the planted treed buffers, including filling in the large triangles of mown areas that are larger than the prescribed 200 foot setback.
- Native mixed forestal plantings would include mixed hardwoods, understory plantings, including broadleaf evergreens, and few coniferous trees to help keep the fire risks down. Also, the plantings should be done in groupings and curvilinear areas to help mask the panels, i.e. soften the edges to blend with the primary landscape patterns.
- DCR recommends that viewshed studies of all the sites collectively be conducted from all public highpoints in the region to evaluate the effects of these large panel developments. As part of this, evaluate any glare impacts on Interstate 95 traffic and the glare impacts on other public roads. As well potential impacts to aircraft.
- Site 0002 is closest to the Orange County line. We recommend coordinating with Orange County due to potential negative impacts to Orange.

The Division of Natural Heritage

We repeat comments made on April 23, 2018. We request copies of any survey work conducted by the County as a result of our comments.

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Po River at Corbin Bridge Stream Conservation Unit and the Plentiful Creek Stream Conservation Unit are located downstream from the project site. Stream Conservation Units (SCUs) identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain.

The Po River at Corbin Bridge SCU has been given a biodiversity ranking of B2, which represents a site of very high significance. The natural heritage resource associated with this site is:

Alasmodonta heterodon

Dwarf wedgemussel

G1G2/S1/LE/LE

The Dwarf wedgemussel grows to a length of approximately 30 mm. This species inhabits creeks of varying sizes, residing in muddy sand, sand, and gravel bottoms, in areas of slow to moderate current and little silt deposition (USFWS, 1993). Currently, this species exists in widely scattered, small populations in the Chowan, James, York, Rappahannock, and Potomac River drainages. Its native host fishes include Mottled sculpin (*Cottus bairdi*), Johnny darters (*Etheostoma nigrum*), Tessellated darters (*Etheostoma olmstedi*) and Sculpins (*Cottus* sp.) (Michaelson and Neves, 1995). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

In addition, the Po River has been designated by the VDGIF as a “Threatened and Endangered Species Water” for the Dwarf wedgemussel.

The Plentiful Creek SCU has been given a biodiversity ranking of B4, which represents a site of moderate significance. The natural heritage resource associated with this site is:

Aquatic Natural Community (NP-Pamunkey Second Order Stream)	G3/S3/NL/NL
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The documented Aquatic Natural Community is based on Virginia Commonwealth University’s **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade B, per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds a “Healthy” stream designation per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

Furthermore, according to a DCR biologist, potential exists for Small whorled pogonia (*Isotria medeoloides*, G2/S2/LT/LE) to occur at the project site. Small whorled pogonia is a perennial orchid that grows in a variety of woodland habitats in Virginia, but tends to favor mid-aged woodland habitats on gently north or northeast facing slopes often within small draws. It is quite natural for plants of this species to remain dormant in the soil for long periods of time. Direct destruction, as well as habitat loss and alteration, are principle reasons for the species’ decline (Ware, 1991). The Virginia Field Office of the USFWS recommends that field surveys for this species be conducted in areas of Virginia south of Caroline County from May 25 through July 15 and in areas of Virginia from Caroline County and north from June 1 through July 20 (K. Mayne, pers. com. 1999). Please note that this species is currently classified as threatened by the USFWS and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Due to the potential for this site to support populations of Small whorled pogonia, DCR recommends an inventory for the resource in the project site. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR supports the planned habitat survey for Small whorled pogonia mentioned in section 6 -Avoidance Measures of the “*Preliminary Assessment of Threatened and Endangered Species*” prepared by Katie Crum at Kimley-Horn and Associates, Inc. on October 4, 2017 and updated March 13, 2018.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at chris.ludwig@dcr.virginia.gov or 804-371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

To minimize adverse impacts to the aquatic ecosystems as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow. Due to the legal status of the Dwarf wedgemussel, DCR also recommends coordination with the USFWS and the VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with protected species legislation. Finally, DCR recommends the development of an invasive species management plan for the project and the planting of native pollinator plants in the buffer areas of the planned facility which bloom throughout the spring and summer.

Furthermore, the proposed project will fragment a C2, C4 and C5 core as identified in the Virginia ConservationVision. The Virginia ConservationVision is a GIS analysis for identifying and prioritizing conservation lands in Virginia. (http://www.dcr.virginia.gov/natural_heritage/vaconvision.shtml)

Cores are areas of unfragmented natural cover with at least 100 acres of interior condition and provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection), and carbon sequestration, along with the associated economic benefits of these functions. The cores are ranked from 1 to 5 (5 being the least ecological relevant) using many prioritization criteria, such as the number of natural heritage resources (i.e. rare species) occurring in a core.

Fragmentation occurs when a large, contiguous ecosystem is transformed into one or more smaller patches surrounded by disturbed areas resulting from the conversion and development. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will preserve the natural patterns and connectivity of habitats that are key components of biodiversity. The deleterious effects of fragmentation can be reduced by minimizing edge in remaining fragments (leaving round versus long, skinny fragments); by retaining connective corridors that allow significant migration between fragments; and by designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

Under a Memorandum of Agreement established between the VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. Survey results should be coordinated with DCR-DNH and USFWS. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to ensure compliance with Virginia's Endangered Plant and Insect Species Act.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The VDGIF maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov.

Thank you for the opportunity to comment.

Fredericksburg Regional Alliance at University of Mary Washington

Memorandum

November 15, 2018

To: Tom Rumora

From: Curry Roberts

CC: The Honorable Tim McLaughlin, Mark Taylor

Spotsylvania Solar

Based on recent discussions with you and those copied on this memo, the Fredericksburg Regional Alliance at the University of Mary Washington has spent roughly three weeks researching issues related to other major solar projects in Virginia and elsewhere around the country; potential marketing opportunities if this particular project is approved; who has opposed, or not, other major projects in Virginia; and additional opportunities, economic development and otherwise, that may exist to attract complementary industries to utilize some of the “excess” acreage around the property being developed.

This memo is in no way an attempt to advise the County on its land use management. Our goal is to provide you with the best information and advice we can provide on where opportunities may exist if this project is approved. Further, we have relied on information and resources other than the material provided by the applicants. This may mean some the information provided below may be redundant with what the County already has already been provided.

DATA CENTER MARKET:

As you know, data centers have been identified by the county and region as a targeted industry and, upon review of the websites of the top seven cloud developers, they all have pledged to invest in renewables to offset their electricity demand. Frankly, this is an area Virginia is playing catch-up in matching it's data centers to solar production. While Virginia ranks 6th in data center locations, we rank 17th in solar production. This is in comparison with North Carolina, which ranks 10th in data centers but 2nd behind only California in the number of megawatts generated from solar sources (see Attachment 5).

Additionally, our region's main competition for data centers outside of northern Virginia are the counties of Fauquier and Culpeper. Culpeper has a nearly 300-acre site (total size) solar farm being developed and another estimated 1,000 acres under study. While not as big, Fauquier has a project under construction of about 125 acres and another under study (see Attachment 2).

Interestingly, while not currently considered a major player for data center attraction, Orange County has approved and is studying up to 1,000 acres of solar farm development around Locust Grove. Our best estimate is the property in question is about seven miles west of the location being considered in Spotsylvania.

It would appear that a development the size of the project in Spotsylvania would give the county a marketing edge for welcoming renewable development compared to our competition. That being said, there is no way to measure whether, or by how much, rejecting this project would impact the county's efforts in data center attraction. However, it would appear from our limited research that very few solar projects are not ultimately approved by numerous jurisdictions across Virginia and the east coast overall.

MARKETING TO OTHER COMPLEMENTARY INDUSTRIES:

As of November of 2017, there are an additional 7,450 megawatts of solar production being studied or proposed across Virginia, not including the project in Spotsylvania. Using the national production ratio of 2.5 acres of panels per

megawatt, this will result in 18,625 acres of land being used (not including buffer, wetlands, RPA, etc). This will require the production of nearly 38 million panels assuming each is an average commercial size of 21.1 square feet.

Additionally, energy storage is growing in demand for everything from solar farms, wind-turbines, data centers, and electric cars. In addition to data centers, the county may be in a unique position to market to manufacturers of solar panels and other cutting-edge energy storage technology companies to Spotsylvania County.

AMAZON/DOMINION EASTERN SHORE, VIRGINIA; TWIGGS COUNTY, GEORGIA:

The largest single solar farm in Virginia is on rented property in Accomack County Virginia (see Attachment 15-16). The 1,000-acre property is less than six miles from the Chesapeake Bay and seven miles to Chincoteague Bay. On reviewing the maps, the entire solar farm is built along RPA and tributaries that are directly in the Bay watershed. Interestingly, we were able to find no known or published opposition to the project by the Chesapeake Bay Foundation, Sierra Club, or the Nature Conservancy. The Conservancy has had an open space land preservation initiative on the Eastern Shore since the 1970's.

In speaking with Dominion, they have experienced no problems with any cracking of their panels from weather or wildlife including birds. This is not surprising, given the standards required by the Department of Energy (DOE) (see Attachment 4,7) and experience with a severe hailstorm that hit a significant panel array recently in Colorado (see Attachment 7). From that hailstorm in Colorado, it was determined that only one small crack in a single panel occurred when multiple hailstones repeatedly hit the same point on the panel.

The result of the severe hailstorm underscores the durability of solar panels. This is accredited to the National Renewable Energy Laboratory's (NREL) work with the U.S. Department of Energy's SunShot Initiative to improve the durability of solar modules. As part of the testing, ping-pong-ball-sized ice balls

were shot at PV modules in multiple places at about 70 miles per hour. Tests like this are aimed to develop standardized industry quality to assure that solar panels on the market can survive the harsh environmental conditions to which they are directly exposed.

Twiggs County, Georgia recently attracted a 2,000 acre project that will supply Georgia Power and the panel installation is being managed by a Charlottesville based company, Coronal Energy. From a business recruitment effort, Twiggs County offered tax incentives to attract the project based on the construction jobs alone.

CERTIFICATIONS TO PURSUE TO ENHANCE IMAGE:

The Virginia Association of Counties offers a Go Green Program. The program is designed to encourage implementation of specific environmental policies and practical actions that reduce emissions. Previous award recipients have been current data center competitors such as Prince William, Loudoun, and Culpepper. Henrico, which just landed a 1.5 million square foot Facebook data center, is also a past recipient.

The Federal Department of Energy offers a SolSmart program, a program designed to recognize communities that have taken key steps to address local barriers to solar energy and foster the growth of mature local solar markets, to assist with the growth of solar power.

Both of these programs could be employed to brand the county as a leader in this area. This could open up possibilities to further attract other industries that wish to locate in communities with strong programs around renewable energy (See Attachment 4) .

SUMMARY:

Based on the research found and described above, opposition to solar farms in other localities on the east coast and in Virginia is rare. Most communities view the addition of solar farms as an enhancement to the community and as an economic development asset. It is conceivable that a solar farm of this scale would give the County a marketable edge in its pursuit of attracting data centers and complementary industries to locate in the County. This is especially true when considering the state's Go Green Program, which has proven to be beneficial to communities who have used it to help attract data centers. It is our opinion, based on our cursory research of other solar farms in Virginia and along the east coast, that the addition of a solar farm of this scale has the potential to have a positive impact on the County's economic development efforts and overall community reputation as a leader in green energy.

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Spotsylvania Go Green

Since its inception no locality in the region has been awarded a Go Green award from Virginia Association of Counties (VACO). S-Power's investment could be the catalyst that kickstarts a countywide environmentally conscious local government. Previous award winners have been Culpeper, Fairfax, Henrico, Loudoun, and Prince William Counties, which are direct competitors of our region in terms of economic development prospects/projects.

VACO Go Green Program:

1. Local governments must register to participate. To do so, you will need a Green Key. To obtain this unique password, click on the name of your locality and submit an email address using the form at the bottom of this page. Once you have received your Green Key via email, return to this page, click on the name of your locality and enter your Green Key to register.
2. Once registered, look over the Challenge to get familiar with its categories and action items. The Challenge score sheet includes helpful links to detailed explanations and examples of each of the action items that can be implemented in your community.
3. Start completing the Challenge and earn "green points" by implementing new actions and adopting new policies that will increase your total score. Amassing at least 100 "green points" out of a possible 565 will earn certification as a "Green Government." Earning 125-149 will earn a Silver designation; 150-174 a Gold designation and 175 and above a Platinum designation.
4. Complete the VML Green Government Challenge and take the environmentally friendly step of submitting it online by September 3th, 2018, for validation. The deadline for submission for VACO certification is October 12th, 2018.

Contact: Patrick Ford (804) 523-8526 or mail to pford@vml.org.

Solar Projects in Virginia (YTD)

1. Clarke Solar Power Facility (2017) - 10 MW / 25 acres
2. DG AMG Front Royal (2017) - 2.5 MW / 6.25 acres
3. Mt. Jackson Solar (Under Development) - 17.5 MW / 43.75 acres
4. Merck (2017) - 2.1 MW / 5.25 acres
5. Whitehouse Solar (2016) - 20 MW / 50 acres
6. Palmer Solar Center (2017) - 5 MW / 12.5 acres
7. Essex Solar Center (2017) - 20 MW / 50 acres
8. Eastern Shore Solar (2016) - 80 MW / 200 acres
9. Cherrydale Solar Power Facility (2017) - 20 MW / 50 acres
10. Hollyfield (Under construction) - 17 MW / 42.5 acres
11. Martin Solar Center (2017) - 5 MW / 12.5 acres
12. Correctional Solar LLC (2017) - 20 MW / 50 acres
13. Phillip Morris Solar (2016) - 2 MW / 5 acres
14. Scott Solar Farm (2016) - 19 MW / 47.5 acres
15. Buckingham Solar LLC (2017) - 19.8 MW / 49.5 acres
16. Bedford Solar (2017) - 3 MW / 7.5 acres
17. Depot Solar Center (Under Construction) - 15 MW / 37.5 acres
18. Danville Solar (2018) - 6 MW / 15 acres
19. South Hampton Solar LLC (2017) - 100 MW / 250 acres
20. Woodland Solar Farm (2016) - 19 MW / 47.5 acres
21. Oceana Solar (2017) - 17.6 MW / 44 acres
22. Sappony Solar (2017) - 20 MW / 50 acres
23. Culpeper North Solar LLC (2018) – 20 MW / 296 acres
24. Fauquier Remington (2018) – 20 MW / 125 acres
25. Fauquier BARC Electric Cooperative (2018) – 0.55 MW
26. Prince William Nokesville Solar LLC (2018) – 20 MW / 300 acres
27. Loudoun Prologis Concorde Center (2018)– 0.7 MW (Dominion – Rooftop Installation)
28. Orange SolUnesco (2018)– 62 MW / 397.6 acres
29. Orange Sol Madison Solar, LLC (2018) – 62 MW / 647 acres

*2.5 acres to every megawatt (MW), number of MW's does not equate to the actual size of the solar site. In most cases project sites include a sizeable buffer between solar panels and the edge of the property.

Except projects highlighted in green, which show project scope in total acreage.

Solar Panel Durability

Solar panels are tested to withstand numerous weather conditions including hail, and hurricane type weather systems. The Sunshot initiative pushed by the Department of Energy required vigorous testing of solar panels. These tests required panels to be able to withstand ping pong size ice balls to be fired at the panels at over 70 mph. NREL or National Renewable Energy Laboratory funded by Sunshot, has joined an international taskforce that standardizes the manufacturing and quality tests for panels sold on the market to withstand harsh weather conditions.

SolSmart

“is a national designation program designed to recognize communities that have taken key steps to address local barriers to solar energy and foster the growth of mature local solar markets” - SolSmart.org

Types of Assistance:

- In Person (Site Visits)
- Remote (Online - Email, Webinars, ect.)
- Peer to Peer - local government elected officials or staff who have applied best practices in their own communities
- Intensive

SolSmart Advisors: SolSmart Advisors are program-funded and program-trained staff who will work in a community or region for engagements lasting up to six months. Host communities are selected through a competitive application process based on potential impact, strength of project narrative, level of need, and geographic and socioeconomic diversity.

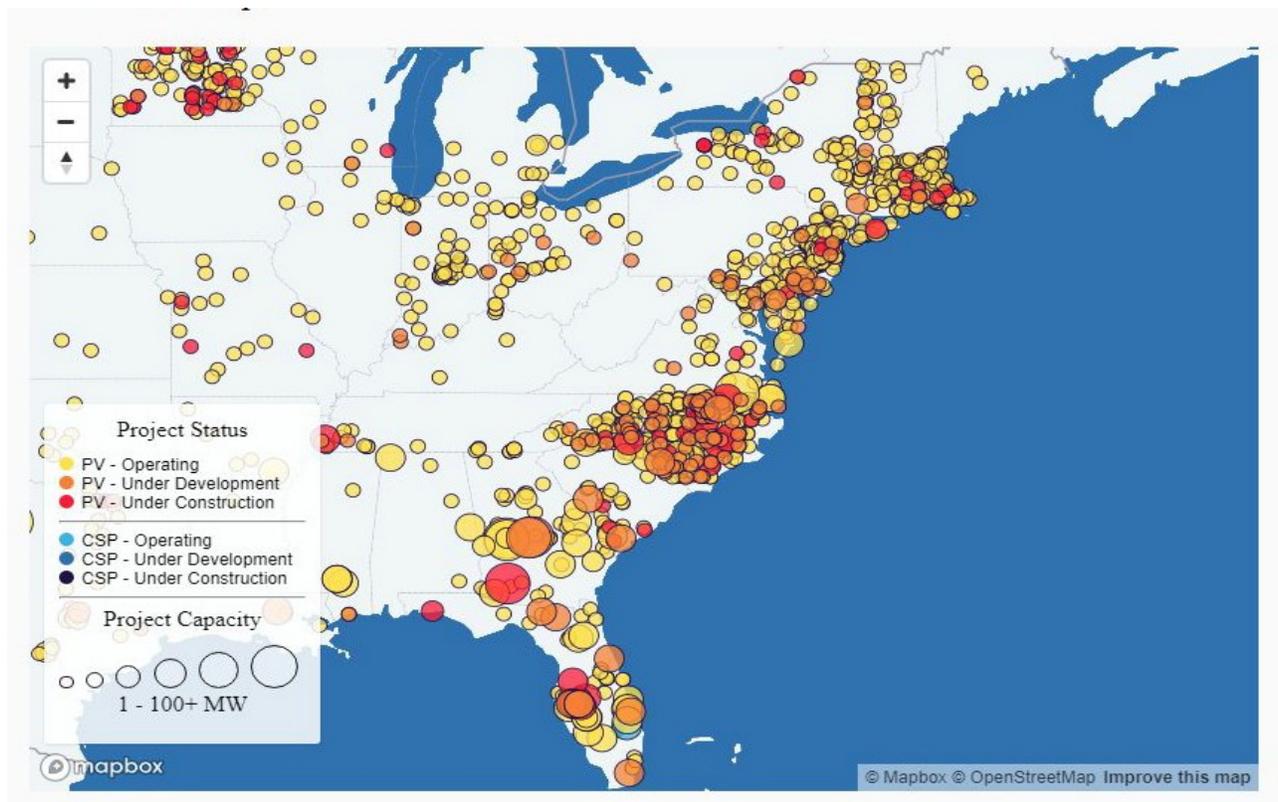
SolSmart Workshops: SolSmart Workshops are intensive, action-oriented sessions designed to empower communities to make significant progress toward achieving designation. Workshops are single or multi-day events, the duration of which are driven by the capacity, needs, and priorities of community hosts. During SolSmart Workshops, technical assistance providers meet with departmental staff in prearranged sessions to assist in the deployment of best practices.

Current Virginia SolSmart Participants

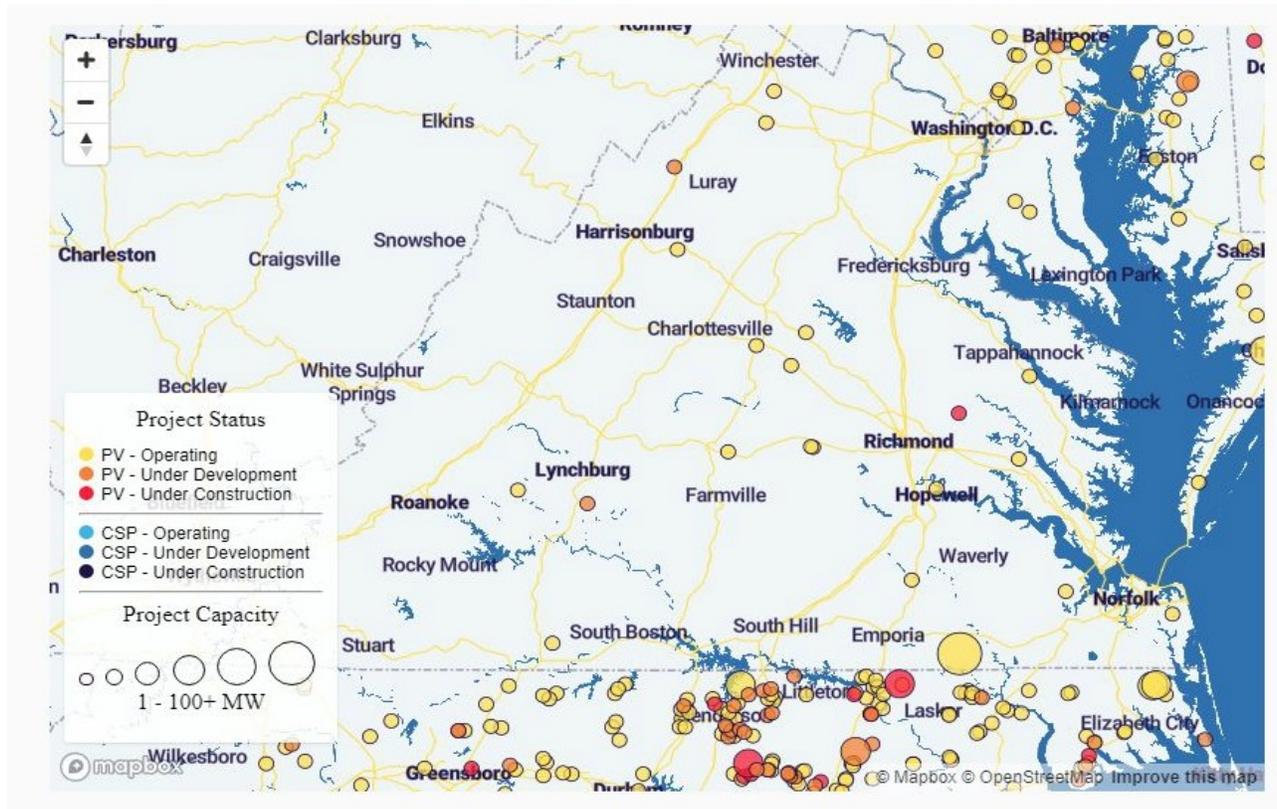
- City of Charlottesville
- Albermarle County
- City of Richmond
- City of Roanoke
- City of Alexandria
- Fairfax County
- Arlington County
- City of Falls Church

Eastcoast Solar Projects Map

Map from Solar Energy Industries Association



Solar Projects in Virginia Map





Hail No! National Lab's Solar Panels Survive Severe Storm

Office of Energy Efficiency & Renewable Energy

MAY 15, 2017

The Denver area was pelted with [an unusually severe hailstorm](#) on May 8 – one that left a trail of destruction in its wake, shattering car windows and leaving golf ball-sized dents on the roofs of local homes and vehicles.

After the storm, staff at the [National Renewable Energy Laboratory](#) (NREL) set out to assess the damage. Its main campus in Golden, Colorado boasts more than 2.5 megawatts of photovoltaic (PV) power. A majority of those panels (more than 3,000) are located on or adjacent to the roof of the lab's [Research Support Facility](#), a net-zero energy building. The post-storm inspection revealed just one broken panel.



Just one PV panel out of more than 3,000 was damaged at NREL following the hailstorm. Photo | NREL
PV Strong

This news wasn't a total shock to NREL researchers. They work closely with the U.S. Department of Energy's SunShot Initiative to improve the durability of solar modules. Included in the testing is the requirement to survive hail stone impact. In fact, the test [NREL researchers are funded by SunShot to participate in the International Photovoltaic Quality Assurance Task Force, which develops standardized industry quality tests](#) to assure that solar panels on the market can survive the harsh environmental conditions to which they are directly exposed. This includes not only how panels react to mechanical stress, such as hail or being walked on, but also high and low temperatures, humidity, solar ultraviolet radiation, and even the electrical stress that the panels apply to themselves when operating in high-voltage systems. These quality standards help reinforce consumer and investor confidence in PV.

NREL also leads a group that brings together national labs and universities with the solar supply-chain industries to discover, develop, de-risk, and enable the [commercialization of new materials and designs for PV modules. The durable module materials consortium focuses on accelerating the research and development of high-](#) performance PV packaging materials and module architectures in order to increase module reliability and performance while decreasing module costs. These efforts will continuously improve the durability and performance of solar panels while driving down the cost of solar electricity. NREL's research demonstrates that solar energy systems are resilient through extreme weather events like hail and hurricanes – and the events of May 8 further underscore the benefits of going solar.



CHARLIE GAY

Dr. Charlie Gay is the Solar Energy Technologies Office Director for the Office of Energy Efficiency and Renewable Energy (EERE) of the U.S. Department of Energy (DOE).

OFFICE of
ENERGY EFFICIENCY & RENEWABLE ENERGY

Forrestal Building
1000 Independence
Avenue, SW Washington,
DC 20585

Accomack Solar Project - Additional Information

Chris Guvernator <cgubernator@co.accomack.va.us>
To: "nminor@fredregion.com" <nminor@fredregion.com>

Tue, Nov 6, 2018 at 8:26
AM

I believe I can help you with your questions.

Our solar project was constructed on several parcels spread out across a large portion of our County. Most of the areas had been farm fields, and the developer proposed little or no grading for the project. The concept was, I think, to minimize land disturbance and take advantage of current drainage patterns. Unintentionally, the access roads constructed with the project dammed off areas and disrupted drainage patterns. This has caused significant ponding that is prohibiting adequate mowing and maintenance operations.

I wouldn't classify it as erosion problems and sediment is not leaving the site. But it has created the need for a follow-up project to improve internal (local) drainage.

Let me know if this helps, or if you have any additional questions or need more information. We could set up a time for a phone call if that would be better.

Chris

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Update on Essex County Solar Farm Storm Water Runoff

Feb 2018 - Friends of the Rappahannock is working with Essex County, Virginia Department of Environmental Quality (DEQ), and Coronal Energy to learn more about the very serious stormwater and erosion and sediment control problems at the 200 acre Coronal Energy Essex Solar Center along Muddy Gut Creek in Essex County.

The project has been mired with compliance problems throughout its installation with many Erosion and Sediment controls deemed insufficient

by Essex County officials and DEQ. These problems compounded by extreme weather and poor timing have left Muddy Gut Creek and the wetlands around it smothered in sediment.

The full extent of the damage cannot be estimated as cloudy water continues to make its way through several miles of meandering streams and boggy wetlands before releasing a light brown cloud into the Rappahannock River.

As warmer weather and spring rains approach, we are encouraging an 'all hands on deck' approach to on site remediation from Coronal Energy. At a meeting on site with Coronal Energy, I was able to meet with several stakeholders and really get a first hand look and understanding of the site impacts. We also learned that Geosyntec, an environmental engineering consulting firm that specializes in erosion and sediment control would to assist McCarthy Inc. with damage control at the site.

Friends of the Rappahannock will continue to monitor this situation closely to push for a swift and complete remediation at the site and beyond.

This is not an isolated incident and does not only happen on large infrastructure projects. Erosion and sedimentation is a byproduct of any form of land disturbance if the right prevention measures are not in place. This is why it is so important for local, state, and federal regulators to ensure high quality plans are in place prior to development. FOR is and has always been committed to working with our partners throughout the process to ensure projects can move forward without degrading the Rappahannock River and our natural resources.

I look forward to continuing to monitor this site and will also utilize the strength of our watershed wide network to ensure that this type of problem doesn't happen again. – Feb 2018

Richard Moncure

Tidal River Steward, Friends of the Rappahannock

Solar Energy Largely Unscathed by Hurricane Florence's Wind and Rain In North Carolina

BY DAN GEARINO

SEP 20, 2018

Faced with Hurricane Florence's powerful winds and record rainfall, North Carolina's solar farms held up with only minimal damage while other parts of the electricity system failed, an outcome that solar advocates hope will help to steer the broader energy debate.

North Carolina has more solar power than any state other than California, much of it built in the two years since Hurricane Matthew hit the region. Before last week, the state hadn't seen how its growing solar developments—providing about 4.6 percent of the state's electricity—would fare in the face of a hurricane.

Florence provided a test of how the systems stand up to severe weather as renewable energy use increases, particularly solar, which is growing faster in the Southeast than any other other region.

When Florence made landfall on Sept. 14, it caused power outages across the region. As energy experts point out, the most vulnerable part of the system is not new at all: it's the power lines and other equipment that transport electricity to customers.

"What we've done this week just underscored what we've known for decades: generating assets are never the main vulnerability," said Chris Burgess, projects director for the Rocky Mountain Institute, a research and consulting firm that specializes in clean energy issues.

The most breakable parts are "the wires themselves, the overhead lines," he said.

Duke Energy said 1.7 million of its 3.4 million customers in North Carolina had power outages at some point during or in the aftermath of the storm. As of Thursday morning, power had been restored to all but about 80,000, and the company expected power to be fully restored next week.

Duke and Strata Solar, two of North Carolina's largest owners and operators of solar farms, said they found almost no damage in initial inspections.

Both companies shut down some systems ahead of the storm in anticipation of flooding. Duke said a peak of about 1,000 megawatts out of 3,500 megawatts of solar were offline after the storm in its territory because of those temporary shutdowns or because of grid damage or other external reasons, but there were few reports of damage to solar panels.

"I know sometimes we think, 'Oh it's the wind, it's the panels flying around.' But we haven't found that to be the case," said Randy Wheelless, a spokesman for Duke, the largest electric utility in the state. "Our bigger worry usually is flooding."

Wheelless found only one example of wind damage: 12 panels at a 60-megawatt solar farm in Monroe were damaged, which is less than 1 percent of the panels there. The company may find additional damage as it does more inspections, he said.

Duke shut down three of its 35 solar farms before the storm arrived because of concerns that floodwaters would inundate substations and other electrical equipment. Those three remained offline as of Thursday

morning as the company waited for waters to recede.

Strata Solar, which has more than 100 solar farms in the state, said it was aware of wind damage affecting small parts of two different sites.

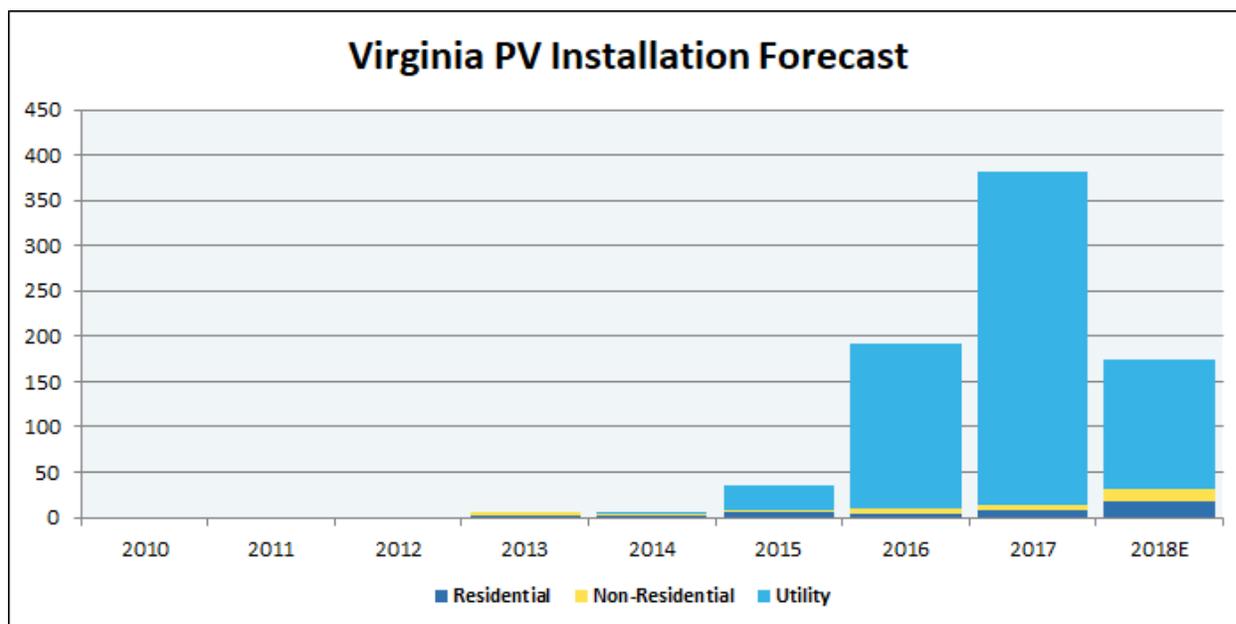
"It's fairly isolated damage," said Brian O'Hara, senior vice president for strategy and government affairs for Strata, which is based in Chapel Hill. "I think a lot of people were looking at Florence as a good test for solar generation's resilience, and I think we've seen a really fantastic outcome."

While solar farms are abundant in North Carolina, the state has only one utility-scale wind farm, largely because political and regulatory opposition has hindered development. The project, called Amazon Wind Farm US East because it sells all of its electricity to a nearby data centers run by an Amazon subsidiary, is in the northeast corner of the state, far from the brunt of Florence's damage. It never stopped operating during the storm, said Paul Copleman, a spokesman for the owner, Avangrid Renewables.

Inside Climate News - A Pulitzer Prize-winning, non-profit, non-partisan news organization dedicated to covering climate change, energy and the environment.

At A Glance

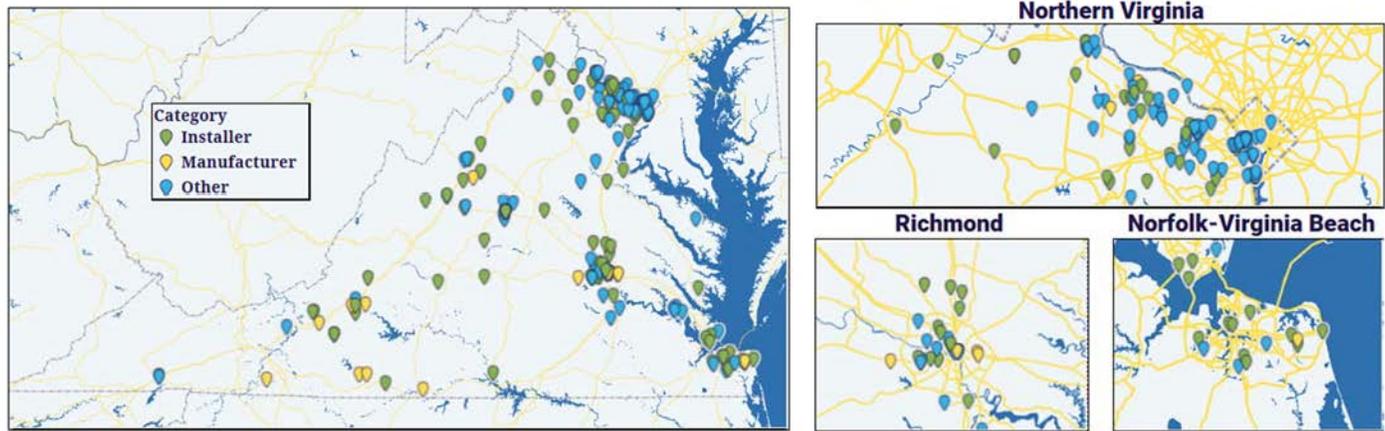
- **Solar Installed:** 635.45 MW (381.25 MW in 2017)ⁱ
- **National Ranking:** 17th (10th in 2017)
- **State Homes Powered by Solar:** 69,060
- **Percentage of State’s Electricity from Solar:** 0.59%ⁱⁱ
- **Solar Jobs and Ranking:** 3,565 (21st in 2017)ⁱⁱⁱ
- **Solar Companies in State:** 199 companies total; 16 Manufacturers, 85 Installers/Developers, 98 Others^{iv}
- **Total Solar Investment in State:** \$777.58 M (\$435.10 M in 2017)
- **Price Declines:** 47% over last 5 years
- **Growth Projections and Ranking:** 2,293 MW over next 5 years (ranks 9th)



Notable Projects

- Southampton Solar, LLC has the capacity to generate 100.0 MW of electricity -- enough to power over 10,868 Virginia homes.^v
- IKEA is one of the first major corporations to get involved in Virginia with their 0.504 MW IKEA Woodbridge project in Woodbridge.^{vi}
- At 90 MW, Eastern Shore Solar, LLC in Oak Hall is among the largest solar installations in Virginia. Completed in 2016 by Dominion Renewable Energy, this photovoltaic project has enough electric capacity to power more than 9,781 homes.^{vii}

Solar Companies in Virginia



About SEIA

The Solar Energy Industries Association (SEIA®) is the driving force behind solar energy and is building a strong solar industry to power America through advocacy and education. As the national trade association of the U.S. solar energy industry, which now employs more than 250,000 Americans, we represent all organizations that promote, manufacture, install and support the development of solar energy. SEIA works with its 1,000 member companies to build jobs and diversity, champion the use of cost-competitive solar in America, remove market barriers and educate the public on the benefits of solar energy.

References:

ⁱ All data from SEIA/GTM Research *U.S. Solar Market Insight* unless otherwise noted: <http://www.seia.org/research-resources/us-solar-market-insight>

ⁱⁱ Energy Information Administration, *Electric Power Monthly*: <http://www.eia.gov/electricity/monthly/#generation>

ⁱⁱⁱ The Solar Foundation, *State Solar Jobs Census*: <http://www.thesolarfoundation.org/solar-jobs-census/states/>

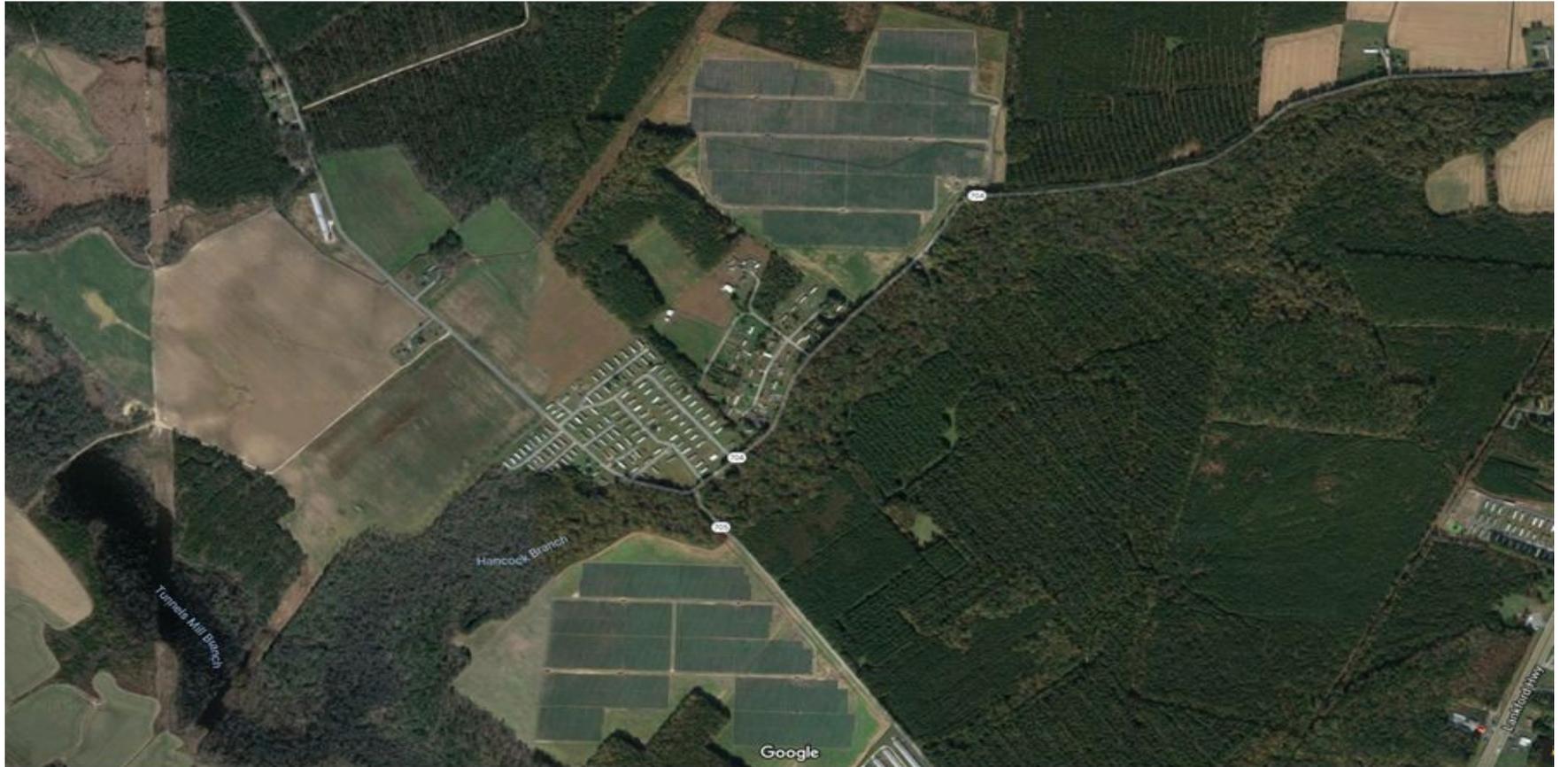
^{iv} SEIA, *National Solar Database*: <http://www.seia.org/research-resources/national-solar-database>

^v SEIA, *Major Solar Projects List*: <http://www.seia.org/research-resources/major-solar-projects-list>

^{vi} Ibid

^{vii} SEIA, *Solar Means Business*: <http://www.seia.org/campaign/solar-means-business-2016>

Accomack Solar Farm Aerial



Accomack Solar Farm Aerial (Bay)



6.1 miles from the Amazon solar farm to the Pocomoke Bay

7 miles from the Amazon solar farm to the Chincoteague Bay