

STAKEHOLDER PERSPECTIVES ON UTILITY-SCALE SOLAR FACILITY DEVELOPMENT  
AND KEY CONSIDERATIONS FOR DECISION MAKERS

RAPPAHANNOCK RIVER BASIN COMMISSION

June 28, 2023

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## Introduction

At the December 2021 meeting of the Commission the Technical Committee was asked to look at the issues surrounding the significant increase in development of solar energy projects. Utility scale projects convert lands currently in use for farming and forestry - what are the impacts positive and negative? Utility scale projects are defined as those capable of generating 5 or more megawatts of electricity. Generally, each megawatt of energy generation requires a little less than 10 acres. The Technical Committee has taken the approach of asking an array of stakeholders to offer their perspectives on state and local public policy surrounding solar energy projects.

The committee dedicated the 2022 meeting schedule to hear from stakeholders. Those invited to offer their input included:

- Localities of the basin through the staff and consultants of the 4 regional planning district commissions,
- The agriculture community,
- Key state agencies – Department of Environmental Quality, Department of Forestry and Virginia Energy,
- Virginia conservation organizations – The Nature Conservancy, Chesapeake Bay Foundation, Piedmont Environmental Council and Friends of the Rappahannock,
- Virginia Tech on the impacts of solar projects on soils,
- Property rights advocate – Energy Right Virginia,
- Impacts of solar developments on local tax revenues,
- Solar developers,
- Dominion Energy, and
- Virginia’s electric cooperatives.

The RRBC Technical Committee is made up of staff and consultants of localities, Planning District Commissions, Soil and Water Conservation Districts, state and federal agencies, NGOs and private-sector representatives with expertise in issues related to water resources. The committee meeting email list includes over 160 participants. Those participating in meetings varies depending on the topic. Over sixty different “members” participated in one or more of the meetings on this topic.

## Acknowledgement

The Rappahannock River Basin Commission would like to thank the following participants in Technical Committee meetings over the course of this effort. The participants listed below joined one or more meetings to contribute to the information sharing and discussions.

Aaron Berryhill, Virginia Department of Energy  
Adam Shellenberger, Fauquier County  
Amelia Boschen, Dominion Energy  
Amy Walker, Department of Conservation and Recreation  
Andrew Smith, Virginia Farm Bureau Federation  
Ann Mallek, Albemarle County  
Ashish Kapoor, Piedmont Environmental Council  
Bill Latane, landowner  
Blake Cox, Energy Right Virginia  
Brent Hunsinger, Friends of the Rappahannock  
Brian Stuver, Dominion Energy  
Brianna Heath, Northern Neck Planning District Commission  
Bryan Hofmann, Friends of the Rappahannock  
Bryan Johnson, Virginia Farm Bureau Federation  
Bryant Bays, Virginia Department of Forestry  
Chip Boyles, George Washington Regional Commission  
Corey Simonpietri, RainSmart Solutions  
Dan Holmes, Piedmont Environmental Council  
Darren Coffey, The Berkeley Group  
Dave Evans, Department of Environmental Quality  
David Nunally, Caroline County  
Deirdre Clark, John Marshall Soil & Water Conservation District  
Don McCown, Piedmont Environmental Council  
Dr. Lee Daniels, Virginia Tech  
Elizabeth Andrews, Virginia Coastal Policy Center, William & Mary Law School  
Harrison Premem, Culpeper County  
Jackie Rickards, Middle Peninsula Planning District Commission  
Jason Bellows, Lancaster County  
Jesse Reiblich, Virginia Coastal Policy Center, William & Mary Law School  
Joe Lerch, Virginia Association of Counties  
Joe Wood, Chesapeake Bay Foundation  
John Bateman, Northern Neck District Planning Commission  
John McCarthy, Piedmont Environmental Council  
John Saunders, Stafford County  
Judy Dunscomb, The Nature Conservancy  
Julie Boathouse, Piedmont Environmental Council  
Karen Cohen, Gentry Locke  
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Luke Peters, The Berkeley Group  
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Meredith Keppel, George Washington Regional Commission

Michael Volpe, Open Road Renewables  
Michael Zehner, The Berkley Group  
Michelle Edwards, Rappahannock  
Rapidan Regional Commission  
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Pat Coady, Northern Virginia  
Conservation Trust  
Patrick Fanning, Chesapeake Bay  
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Patrick Mauney, Rappahannock-Rapidan  
Regional Commission  
Paul Howard, Culpeper County  
Rod Compton, Virginia Department of  
Taxation

Ryan Gilchrist, Open Road Renewables  
Sara Hollberg, Land Use Consultant for  
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Sarah Parmelee, Piedmont  
Environmental Council  
Scott Cameron, Northern Virginia Soil &  
Water Conservation District  
Scott Foster, Gentry Locke  
Skyler Zunk, Energy Right Virginia  
Stephanie Kane, Old Dominion Electric  
Cooperative  
Terry Lasher, Virginia Department of  
Forestry  
Tommy Blackwell, Essex County  
Zach Jacobs, Virginia Farm Bureau  
Federation

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## **Views of the PDCs and Localities of the Basin (March 30, 2022)**

Virginia's planning district commissions (PDC), sometimes called regional commissions, are chartered by the localities of the region under the Regional Cooperation Act. Consequently, they are a creation of the member local governments and the interests of each PDC are the interests of its localities. Staff, including in some cases consultants, of each PDC regularly participate in the work to the RRBC Technical Committee. PDC representatives were invited to offer the PDC/locality perspectives.

### Rappahannock-Rapidan Regional Commission (RRRC)

Michelle Edwards, Environmental Program Manager, overviewed recent amendments pertaining to solar ordinances and permits in Culpeper, Fauquier, Orange and Rappahannock Counties noting that Orange County is the only county without a specific ordinance. She says the biggest challenge is navigating land distinctions (farms, commercial, industrial, etc.). The lease payments available for solar projects are outcompeting what can be paid for farming. She adds there are concerns that not all costs of solar projects are understood, such as the long-term impact of soil compaction after the useful life of the solar facility. There is also concern that DEQ does not have sufficient staff to handling permitting and oversight efficiently. Localities in RRRC would like to see incentives for companies to site projects on less productive agriculture and forest land. The impact and scale of storage batteries is another concern. When reviewing project proposals localities would like an unbiased overview of how current laws work and how responsibilities are shared between localities. She shared a regional solar suitability analysis map.

In response to the presentation the Technical Committee members offered the following comments:

- Joe Lerch of the Virginia Association of Counties (VACo) summarizes recently passed HB894 which among other things directs the Virginia Extension Service, working with Dominion Energy and Appalachian Power, to identify relevant distribution and transmission grid information to assist localities with collection or storage devices. It includes a provision exempting it from the Virginia Freedom of Information Act.
- Eldon James (RRBC) adds that this bill largely flew under radar and may be first of its kind in that it would require mapping prime farmland as an official state document.
- It was added that DEQ and PJM Interconnection LLC (PJM) have websites to track proposals and applications.
- David Nunnally (Caroline County) shares that a big item for farmers and landowners in Caroline County is a desire for guaranteed income each year with the uncertainties of solar.
- Harrison Premen (Culpeper County) floats the idea of prioritizing Community Scale Solar which rests on conditional usage without wiping out prime agricultural land.

- Luke Peters (TBG/GWRC/MPPDC) is curious how RRRRC accessed solar suitability map that indicates high power transmission lines as data has not been made publicly available.
- Pat Coady of the Northern Virginia Conservation Trust (NVCT) adds that one of the biggest issues in the larger discussion is obtaining data and having trust in it.
- Pat Coady suggests at a future meeting looking into decommissioning issues.
- Joe Lerch (VACo) says that nothing prevents localities from reaching out to energy companies to directly ask and cites example of Rockingham recently obtaining info from Dominion Energy.

#### George Washington Regional Commission (GWRC) and Middle Peninsula Planning District Commission (MPPDC)

Luke Peters of The Berkley Group (TBG) spoke representing the two PDCs. He began by agreeing that with the concern over DEQ staffing, purposing weekly check-ins. He referenced Caroline County's policy limiting land disturbances to only 100 acres at one time to try to limit runoff management and impact. He adds there are no requirements for backup dry retention ponds. He adds that Caroline reserves industrial zoned land is for industrial use only that does not include solar facilities. This pushes solar into agriculture and forest land. He points out that public comments indicate more concern over viewsheds and local character of land versus ecosystem services. He said there are concerns of what solar recycling will cost over the long term. Under current impervious designations he notes that solar developers may choose to gravel an entire site and installation mitigation features to account for impacts. Concern exists on the impacts of soil compaction post project life. He suggests that industrial brown fields may be a better location for projects. It was noted that the industrial areas often have infrastructure investments (water, sewer, etc.) that would be underutilized with the siting of a solar project. It was further noted that legislation passed the 2022 General Assembly that calls for studying the life cycle costs of solar facilities with a report due by May of 2023. The impacts of projects on wildlife corridors is a concern and it was noted that the Department of Wildlife Resources (DWR) has only basic information. In response to a question from Bryant Bays of the Department of Forestry (VDOP) about the existence of local restrictions on the percentage of agriculture or forest land converted it was pointed out that Southampton County is considering such a restriction. In some jurisdictions general percentage limitations exist but not specific for forest land but many ordinances call for buffers leaving existing forest strips in place.

#### Northern Neck Planning District Commission (NNPDC)

John Bateman, Regional Planning with NNPDC reported that Westmoreland County was first to see a project of the three basin localities in the PDC. There has also been activity in Richmond and Lancaster counties. Buffering is a big concern. Richmond County has become the most active. They view utility scale solar as economic development. Buffers and preserving visual landscapes are a priority. A 1600-acre site (148 megawatts) has

been approved and others are pending. Becoming concerned with “down-the-road” issues and would like more insight from Dominion and others on this. The northern neck localities are concerned that solar developers have a limited knowledge of local government processes; they would like to know more about industry standards. There are some concerns that solar facility development may be an unstoppable force. They are seeing a push for leasing/acquiring the lowest cost land; site suitability mapping like done in the RRRRC is valuable. He states that deforestation is the biggest concern. There is some sentiment that greater promotion of smaller sites and individual residential should be occurring.

In response to the NNPDC presentation the Technical Committee members offered the following comments:

- Joe Lerch (VACo) says that Dominion are not ones developing all facilities. He provides example of Charlotte County and how regardless of specific solar location, the transmission must be approved.
- Patrick Coady (NVCT) notes that a mechanism (within green infrastructure) was brought in to deal with solar and would like to know where these plans can be found.
- John Bateman (NNPDC) notes that local staff is on the front line and the planning districts is not in a strong position to assist. Expresses appreciation on behalf of localities in the commission’s acknowledgment of this issue.
- Luke Peters (TBG/GWRC/MPPDC) expresses need for state to commit to consistent definitions so that nothing unintentionally affects rural communities and to ensure that private landowners are getting fair shake when requirements are being met. Eldon James references relevance of this to earlier point of guaranteed income.

The floor was opened for comments and observations:

- Inside Climate News article was recommended: “Overwhelmed by Solar Projects, the Nation’s Largest Grid Operator Seeks a Two-Year Pause on Approvals”
- David Nunnally (Caroline County) notes the ongoing effort to preserve natural corridors and seeks to identify if it meets some of the goals of green infrastructure planning. Proposes to then examine if these natural lands should be managed for that purpose versus a hands-off approach. Provides example wetlands and indications of run-off problems.
- Michael Zehner (TBG/GWRC/MPPDC) mentions a plan by Scott Baker, PJM (scott.baker@pjm.com) which offers an opportunity for collaboration between wildlife and solar initiatives. He suggests that if there is a locality that wants to develop best practices, this may be an avenue.
- Joe Lerch (VACo) notes that almost half of projects never make it to fruition, delaying otherwise viable projects.
- Bryant Bays (VDOF) points to an initiative that is looking at forest management within solar parcels.

- Tom Blackwell (Essex County) discusses Essex's facility and notes that per state code, they are unable to tax it.
- Luke Peters (TBG/GWRC/MPPDC) mentions a tool for taxing: SolTax (<https://energytransition.coopercenter.org/soltax-tool>)
- Tom Blackwell points to the facility's big impact on the community, as there was a large storm which produced immense runoff into the river. It was a lesson on how not to handle these cases. He also mentions the three fires at the facility and discusses the jeopardy for adjacent landowners.
- Michael Zehner (TBG/GWRC/MPPDC) mentions that NFPA has info on system fire suppression integration.
- Joe Lerch (VACo) discusses battery systems in regard to fire hazards and suggests that Dominion would rather facilities burn through, than to have first responders on site. However, he notes that Dominion does want greater distance between components to prevent chain fires. He adds that we need to know more about the gas released in such fires.
- Luke Peters (TBG/GWRC/MPPDC) concurs that there is much discussion surrounding gas emitted from burning batteries.
- Bryant Bays (VDOF) mentions electrical shorts and the inability to address these as they build up until company leaves facility.
- Tom Blackwell notes that while the inability of his county to tax the facility is a concern his biggest concern is the off-site impacts that include the Rappahannock River.

## **Views of the Agriculture Community (April 20, 2022)**

Mr. Andrew Smith of the Virginia Farm Bureau\* offered to summarize the perspectives of the agriculture community. The Virginia Farm Bureau has taken a neutral policy position on solar development as they believe that landowners should be able to make decisions that suit their circumstances. The Farm Bureau wants landowners to have access to the best information possible when considering potential projects. He stressed the importance of examining the impact on land and long-term plans after the useful life of a project. There has already been erosion and sedimentation issues associated with sites in Essex and Louisa counties. Mr. Smith points to the need to consider the agricultural impact, as land use changes it impacts other businesses. Farmers also have concerns about impacts on local real estate taxes, will changes caused by projects put more tax pressure on existing farm operations. He called attention to the recently passed HB206 which requires mitigation if a small energy project (such as solar) is found by DEQ to have a significant impact on, among other things, prime agricultural soils, or forest land. He concludes by stressing the importance of protecting topsoil and his concern for the ability to reestablish comparable agricultural production after the 30-year useful life of a solar project.

Committee discussion began by echoing the concern for what happens after the decommissioning of a solar project. It was pointed out that another bill introduced during the 2022 General assembly session, HB774, calls for a study of the life cycle of such projects. Concerns were raised about proper disposal on the solar panels upon decommissioning, can they be recycled? Is there hazardous material to be handled? Another bill that passed, HB894, directs the Cooperative Extension Service to create a mapping tool that identifies prime agricultural lands. This can potentially be an important source of data for decision making and planning. It was pointed out that the Culpeper County Board was looking at restricting solar projects to industrially zoned land as a strategy to protect prime farm and forest land.

The discussion moved to community/shared solar as an alternative that mitigates the impacts of large projects, 30 to 50 acres in size. The economic viability of the smaller projects was questioned from an investor perspective. SB660 passed that sets up a stakeholder group to evaluate shared solar programs and the electric co-ops. It was pointed out that some counties are considering ordinances that limit the total percentage of agricultural land that can be converted to solar (Louisa and Rockingham). Caroline County's current ordinance gives preference to smaller projects and prohibits projects over a certain size. Some questions were raised about smaller projects, can multiple smaller projects be aggregated and marketed to major investors? There are not examples of this being done. Are there ways to encourage power companies to distribute the power

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\* Andrew Smith was Associate Director of the Virginia Farm Bureau Federation until August of 2022 when he was appointed Chief Deputy Director of the Virginia Department of Conservation and Recreation.

locally before going to the power grid? It was pointed out that this is not financially attractive to either Dominion or the co-ops.

The discussion moved to local government capacity to evaluate and manage large projects. It was stressed that the smaller counties do not have the staff capacity to support the governing body's need to evaluate complex proposals and once approved to provide the level of oversight such as site inspections. An option is to require the solar developers to financially support the hiring of third-party inspectors working for the locality. The use of the solar host agreement authority (15.2-2316.6 through 2316.9) can enable localities to negotiate many project conditions including third-party inspectors, environmental, land use or public safety requirements. Concerning public safety, it was pointed out that batteries have caught fire on some sites. What is the proper response and what are the threats during and after such events. The Department of Emergency Management recommends local fire responders focus on keeping fires "inside the fence."

It was stressed that planning commissioners need technical support when evaluating projects. Concern was expressed that sometimes misinformation is shared and landowners, planning commissioner, staff and elected officials need to be able to separate misinformation from sound analysis. All need access to reliable technical and legal expertise.

Committee members stressed the importance of hearing from key state agencies, Dominion, the co-ops, and solar developer as this discussion moves forward.

## **Views of Key State Agencies (May 18, 2022)**

### Department of Environmental Quality

Melanie Davenport, Director of the Water Permitting Division, began by saying it is beneficial to the environment for renewable energy to be part of the portfolio. Legislation has financially incentivized Dominion and others to invest in renewable energy. Her office is responsible for permitting. As with any project over an acre a stormwater management permit is required. DEQ serves as the stormwater manager for counties that opted out of running their own program. In 2017 there was an increase in stormwater management plans and permitting for solar projects. Initially the projects were 75 to 80 acres and construction techniques were less sophisticated. The activity has increased dramatically with larger projects and more design engineers from out of state who had to learn Virginia's rules. Solar projects must comply with the Stormwater Permit By Rule (PBR) and the Construction General Permit. Drew Hammond, P.E. with the Water Permitting Division said a Solar Implementation Letter was issued in April and for future projects solar panels will be considered Unconnected Impervious Areas unless an "Interconnection Approval" is granted by December 31, 2024. He added that streamlined plan review for Stormwater Management and Erosion and Sediment Control Plans (SWM and ESC) is being developed and will be out for public comment in the summer (2022). This will simplify the permitting process and improve compliance; it will include significant guidance information.

The presentation moved to HB206, passed in the recent legislative session. It specifies that for renewable energy projects that disturb more than 10 acres of prime agricultural soils or more than 50 acres of contiguous forest or forest enrolled in a forestry preservation program it is deemed to be a significant impact on natural resources. A mitigation plan is required. DEQ will be developing regulations.

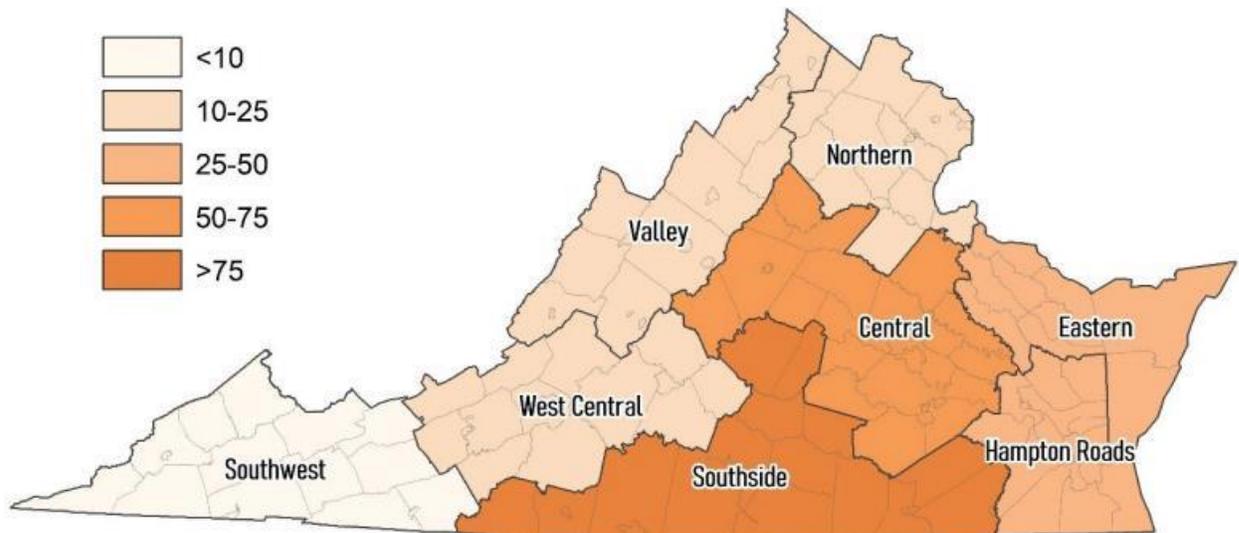
Discussion by the committee raised the inherent tradeoffs of renewables – good for the environment from an energy generation and decarbonization of the air but negative from a conversion of prime ag and forest land and the associated air and water impacts. In response to a question about technical assistance for localities when evaluating project proposals Ms. Davenport said the regulation and guidance work underway will help localities. She was asked if there has been analysis of how the land cover conversion might impact Chesapeake Bay goals. Ms. Davenport said the Solar Implementation Letter mentioned earlier is an important step and that DEQ is working with the Bay Program on the definition of impervious. She also referred to HB206 while acknowledging that the focus has been on transitioning to renewables versus the impacts of the transition.

### Department of Energy

Aaron Berryhill, Solar Program Manager, says as of May 1 (2022) there are 52 facilities of 5 megawatts or larger. The number of larger projects is growing. The Department worked

with the Weldon Cooper Center to complete the Virginia Solar Survey. 82% of counties and cities responded. 37% said they are in the process of updating their policies, regulations or permitting. 24% said they have recently completed updates. Rural and combination localities are where the most update activity is occurring. 51 of the 109 localities responding said they have reviewed at least 1 solar project application. Collectively, localities reported approving 80% of all applications for utility-scale solar facilities. The most are in southside and central Virginia.

Local Applications for Large-Scale Solar Facilities (>500 kW) by Region



Source: Virginia Department of Energy

Over 60% of localities either have renewable energy goals or policies in their comprehensive plan or are in the process of updating or intend to update. 56% indicated their ordinance provides a clear regulatory pathway for approval. 45 of the 109 respondents said they have adopted a solar ordinance and 10 indicated they are in the process of adoption. When asked what resources are used in developing ordinances most look to other localities but also use membership associations, industry professionals, private consultants, planning district commissions and to a lesser extent institutions of higher education, utilities, and national research entities. A handful used nonprofit and advocacy groups and extension offices.

Mr. Berryhill touched on DEQ's PBR that is applicable to solar projects greater than 5 MW or 10 acres but under 150 MW, over 150 requires State Corporation Commission review. He also spoke about HB206 and HB894. The latter directs the Cooperative Extension Service to develop a map of prime farmland to assist localities. Finally, he spoke about HB774/SB499 which directs the SCC to convene a workgroup to analyze the life cycle of renewable energy facilities. The group is to study recycling, waste strategies, liability for decommissioning, impacts on life cycle of farming and forestry and the beneficial economic impacts. The report will be due in May of 2023.

Mr. Berryhill concludes adding that PJM has issued a 2 year pause on accepting new connection applications. Committee discussion reveals confusion of the sequencing of approval process – what comes first PJM, DEQ, local land use?

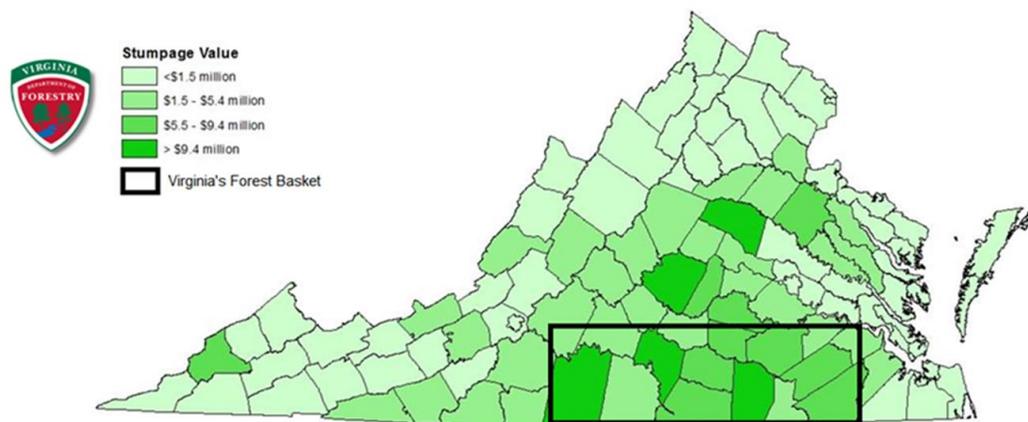
### The Department of Forestry

Terry Lasher, Assistant State Forester, spoke to the perspective of the Department and the impact of solar facility location on forest land. He stressed that the Department views renewable energy and good, but it is a rapidly changing environment. Balance is important when making location decisions, deforestation is bad, the impacts can be exponential. There is a need for evaluation of long-term and all associated costs. He turned to explaining why solar development has grown – State policy is a driver, specifically the 2020 Virginia Clean Economy Act (VCEA) as well as technology and decreasing costs. VCEA mandates 16,100 MW from solar and onshore wind; net zero carbon by 2050 (Dominion 2045, AEP 2050). By 2025 at least 75% of all sources counted toward suppliers’ renewable goals must be associated with facilities in Virginia. Retirement of all coal fired plants by 2024 and all natural gas plants by 2045/2050. Virginia’s largest energy companies must construct or acquire more than 3,100 MW of energy storage capacity.

In 2010 solar production nationally was 10,000 MW. In 2020 it had grown to 100,000 MW. 1 MW-hour equals about 200 homes. Virginia is 9<sup>th</sup> in solar generating capacity; North Carolina is #4. Virginia ranked 4<sup>th</sup> in 2021 in newly installed capacity and 8.2% of electricity generation came from non-hydroelectric renewable sources – solar, wind and biomass. Currently, 17.7% of the nation’s electricity is from renewable sources.

S-Power Pleinmont Solar Facility in Spotsylvania County is the largest in Virginia. Capacity is 500MW with 1.8 million panels over 6,350 acres. When constructed it was the fifth largest in the country and largest east of the Rockies.

The areas of concentration of solar projects overlaps with Virginia’s “Wood Basket.”



The potential impact as we move toward the VCEA goal of 16,100 MW, at an average of 9 acres per MW, the goal will require 144,900 acres under solar panels. In 2020 we had 38 active solar projects covering 13,842 acres. The land converted was 62.9% forested, 31.9% crop or pasture and 5.2% barren, wetland, herbaceous, etc.

Committee discussion pointed out that HB206 says wetlands impact and non-compliance with WIP3 goals must be considered. Questions on cost benefit analysis revealed that work is being done but there is not currently a single all-encompassing analysis. Some of the analysis includes US Forest Service's iTrees tool\* and the mapping work to be done by Cooperative Extension as called for in HB894. Another tool is "Brightfields" that identifies old mining sites.

A driver not previously mentioned is data centers. The development of data centers in Virginia has grown dramatically, especially in northern Virginia. They have large power demands, and the owners/developers of data centers mostly demand renewable energy sources.

Committee discussion concluded with a recognition of the conflicts between different stakeholders in the local approval process including landowner of project site, adjoining owners, economic interests, environmental interest, etc.

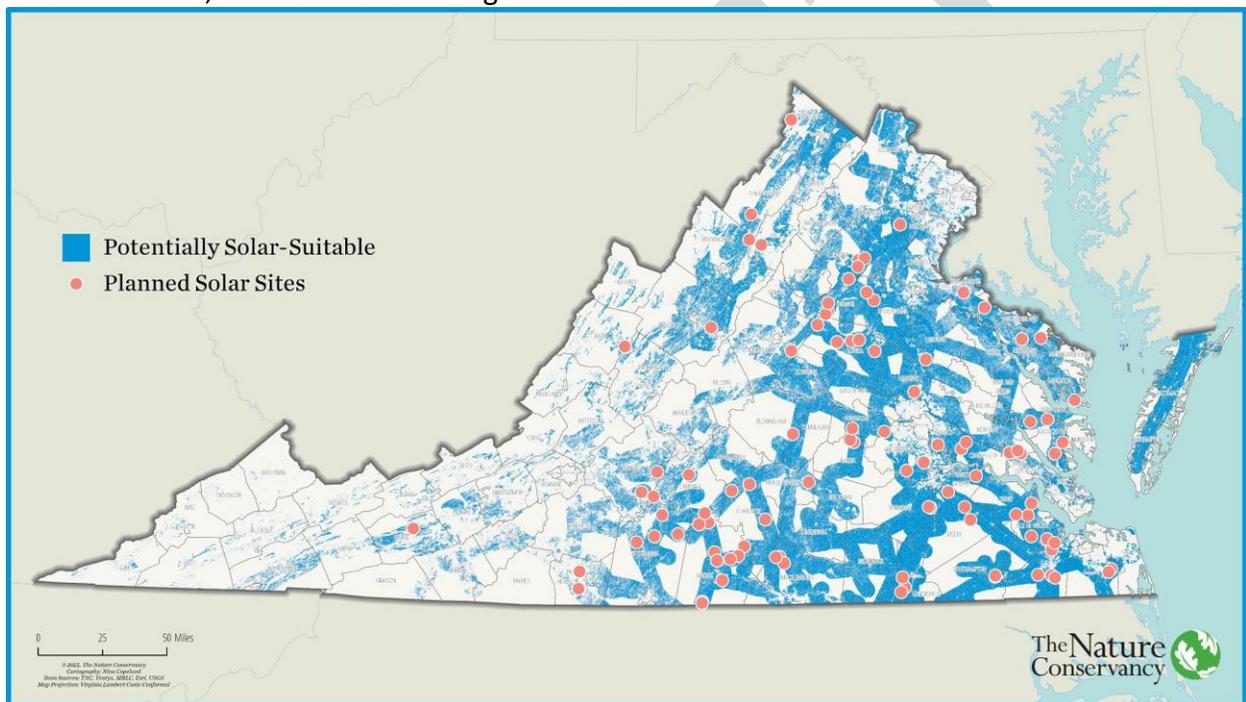
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\* i-Trees is a peer-reviewed software suite from the USDA Forest Service that provides urban and rural forestry analysis and benefits assessment tools. The i-Tree tools can help strengthen forest management and advocacy efforts by quantifying forest structure and the environmental benefits that trees provide. It contains numerous tools to measure ecosystem service outputs <https://www.itreetools.org/tools>.

## Views of Virginia Conservation Organizations (June 15, 2022)

### The Nature Conservancy

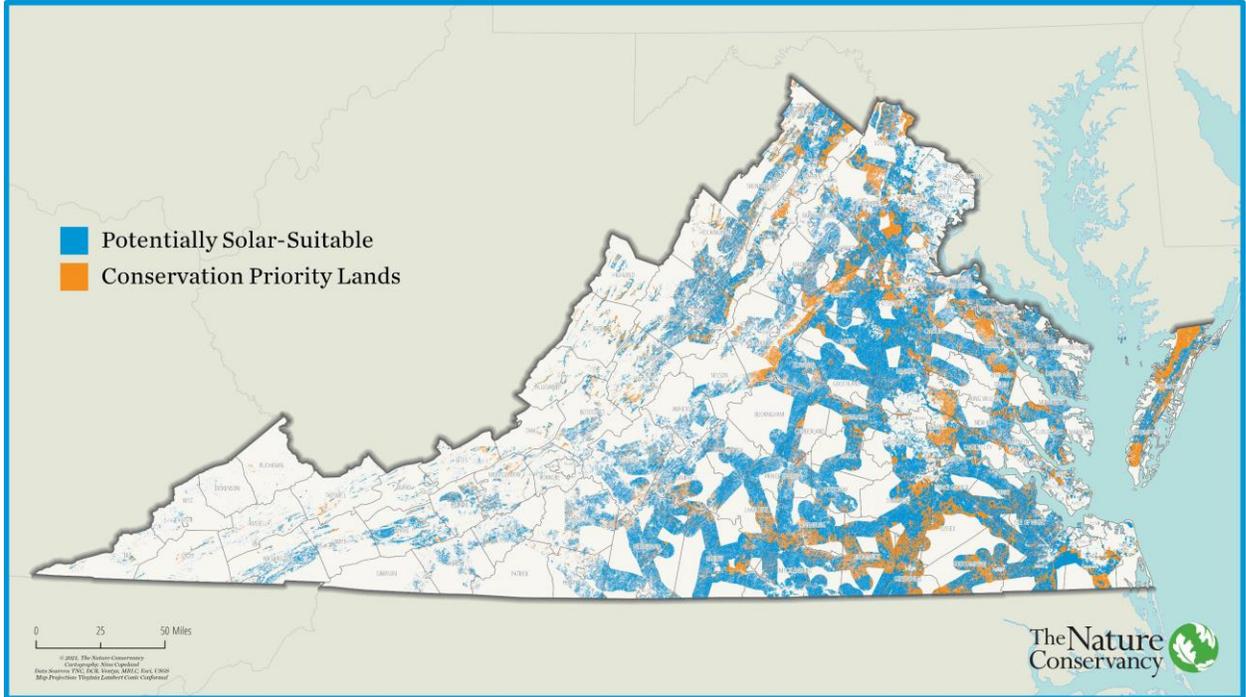
Judy Dunscomb, Senior Conservation Scientist with The Nature Conservancy (TNC) began her presentation by stating that all forms of renewable energy, regardless of how good they are for the climate have impacts. Renewable energy facilities have a larger footprint than fossil fuels. TNC believes the goal must be renewable energy development and conservation. They believe it is important to move to renewables to address climate change while simultaneously providing a path forward for the post coal economy for the many coalfield communities. TNC's study of the smart development of solar shows there is over 8.7 million acres of solar-suitable land in Virginia – key factors are slope, distance to transmission, land cover and contiguous area.



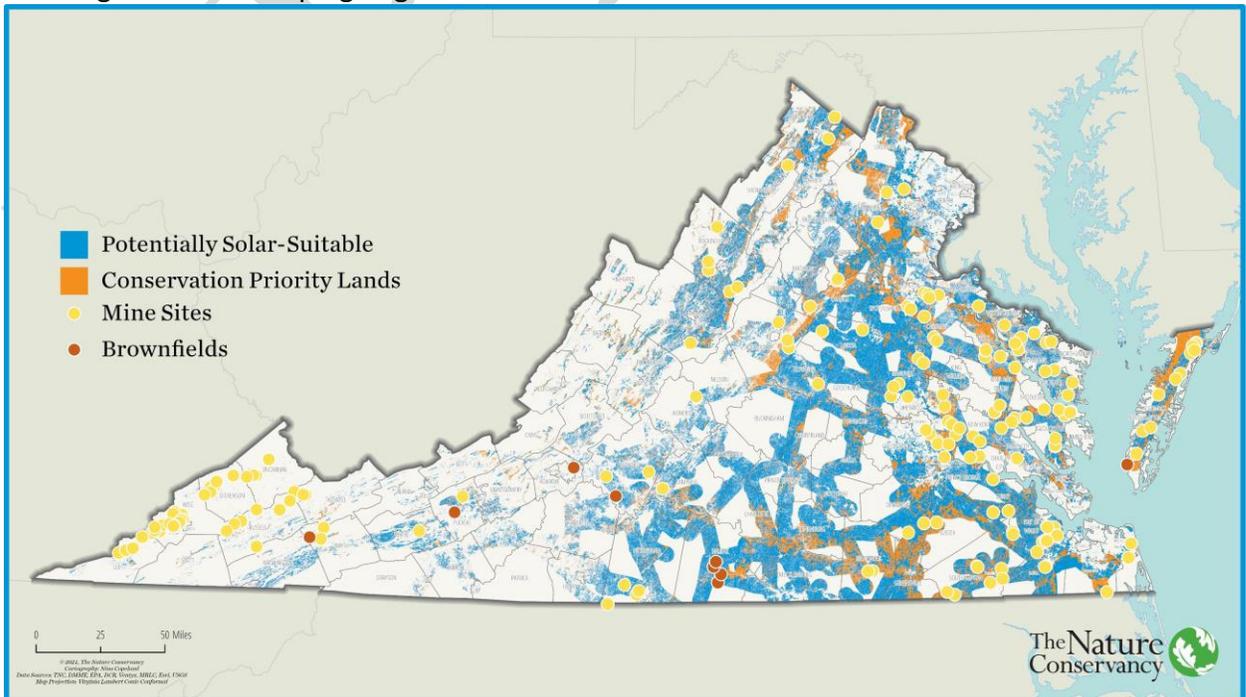
She explained ConserveVirginia has identified the highest value and highest priority conservation lands that represent a range of natural resources valued by stakeholders. ConserveVirginia mapping has identified over 7 million acres of lands meeting top priority conservation opportunities across seven major categories: Agriculture & Forestry, Natural Habitat & Ecosystem Diversity, Floodplains & Flooding Resilience, Cultural & Historic Preservation, Scenic Preservation, Protected Landscape Resilience and Water Quality Improvement.

Overlaying potentially solar-suitable lands with the ConserveVirginia highest value conservation lands identifies over 2.2 million acres of solar-suitable lands that should be avoided. The net available for solar development while still conserving the highest priority conservation lands is over 6.4 million acres. The VCEA calls for 16,100 MW of energy from

renewables which equals approximately 161,100 acres. If you cut the land suitable for solar in half (3.2 million acres) and doubled the land required per the VCEA (322,200 acres) TNC opines that we have 10 times the land needed to meet our goals and avoid inappropriate negative impacts on conservation efforts.



The TNC study then looked at the opportunities to redevelop degraded sites – mine sites and brownfields. They found opportunities exist but there can be unique and costly challenges with developing degraded sites.



TNC is working in Southwest Virginia on a demonstration project with Dominion Energy and Suntribe to develop a project on TNC lands. TNC believes that through a combination of brownfield development, rooftop solar and distributed solar they can reduce the pressure on green field development.

During Committee discussion Ms. Dunscomb explained that the TNC mapping referenced in her presentation is available to be used by communities in their project suitability analysis.

<http://conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/virginia/Pages/solar-siting-va.aspx>

The ConserveVirginia resources are available through the Virginia Department of Conservation and Recreation which manages this tool used to guide state investments for land conservation to ensure highest conservation outcomes.

<https://www.dcr.virginia.gov/conservevirginia/>

#### The Chesapeake Bay Foundation

Dr. Joseph Wood, Senior Scientist with the Chesapeake Bay Foundation (CBF) said that his remarks look at solar development through the Bay restoration lens. He shares that the fast pace of solar facility expansion has the potential to offset some of the progress made in addressing water quality issues. The Commonwealth has invested billions of dollars to address wastewater treatment upgrades and agricultural cost share programs. We need to find ways that the landscape changes associated with large scale solar projects do not affect the work done to improve water quality. It's good to see that the Bay Program's Scientific Technical Advisory Committee (STAC) is actively working to address this issue, including stormwater management, through workshops. Retrofitting can be challenging, so finding a way to integrate solar into the landscape without negatively impacting water quality is an important consideration.

#### Piedmont Environmental Council

Dan Holmes from PEC notes that all energy sources have costs, and while utility scale solar does not produce carbon, it is a highly concentrated plan. He emphasizes the need to avoid, minimize, mitigate, and restore natural resource conflicts and points to meaningful decommissioning of solar facilities and restoration of sites. He suggests that avoiding Class 1 and some Class 2 soils might be a strategy and that screening off-site from development may also need to occur to protect specific scenic or historic resources. He explains that localities need to ask whether they want to look at the mitigation efforts, since the state will not be doing that. He believes that citizens need to be empowered to get involved in community and rooftop solar to reduce the need for greenfield solar sites.

The discussion among Jason Bellows, Dan Holmes, Joe Lerch, Judy Dunscomb, Harrison Premen, and Eldon James revolves around the feasibility of rooftop solar and utility-scale solar in achieving net-zero goals and the challenges associated with them.

Dan Holmes notes that rooftop solar and community projects can contribute up to 40%, but nuclear energy can also change the conversation, and currently, utility-scale solar is at about 90%. He also emphasizes the need to accurately capture the costs associated with each decision to find a better way forward.

Joe Lerch raises his concern that even with utility-scale solar and wind, there is no guarantee of reaching zero carbon, and once 50% of the base load is achieved from renewables, lithium-ion batteries will not provide the required storage. He suggests the need to come up with another option, including nuclear energy.

Judy Dunscomb shares a study that suggests Virginia could account for roughly 30% from rooftop solar to avoid the need for greenfield development, but there are barriers to this, including the fact that distributed generation is not consistent with the investor-owned utility business model. She also suggests working with electric co-ops as a real opportunity for the basin.

Harrison Premen asks if there are any policy guides regarding localities helping expand distributed solar projects or solar siting for utility-scale solar, and Dan Holmes notes that many nonprofits have championed this work.

Eldon James notes that the developers behind data centers are driving some of the demand for solar development because they want their power to be green power. He asks if they are putting panels on their roofs, and Dan Holmes notes that the roofs are often used for cooling, but there may be some changes that may allow for this.

Finally, Pat Coady asks whether anyone has attempted to put together a map for the Rappahannock River Basin of proposed solar facilities and overlaid on ConserveVirginia priorities or other conservation priorities, and Dan Holmes notes that PEC has done some of this in specific project scopes, but keeping up with and anticipating upcoming projects remains a challenge.

### Friends of the Rappahannock

Brent Hunsinger of Friends of the Rappahannock (FOR) notes that two Board of Supervisor members from the watershed will be on the workgroup following the passing of HB 206. He highlights the issue of localities grappling with solar, particularly with the Caroline County Board of Supervisors. FOR would like solar panels to be considered impervious and post-construction BMPs need to reflect this, which DEQ has decreed, and guidance has been released. Post-construction site stabilization should include native seed mixes and erosion control measures, especially for large developments or land clearings during

heavy rainfall and storms. Wetlands, the 100-year floodplain, and the Resource Protection Area (RPA) should all be off-limits during solar construction, and a buffer overlay should occur for counties not subject to the Chesapeake Bay Protection Act, akin to RPA buffers. FOR is looking to safeguard all natural resources and maintain a balance of interests, including reducing destruction of tree canopy. They support good solar ordinances, with Caroline County held in high regard in this matter\*.

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\* The Caroline County Board subsequently repealed the ordinance reference above over a number of concerns but primarily with E&S and stormwater management problems that had occurred at other facilities in nearby and neighboring counties

## Soil Compaction and Solar Facility Decommissioning (August 17, 2022)

Professor W. Lee Daniels from Virginia Tech delivered a presentation on "Large Scale Solar & Legacy Issues - Soil Considerations". Professor Daniels focused on site disturbance processes and their applicability of large-scale solar projects. He discussed soil disturbance expectations for solar sites, noting that it could be less than 10% in some cases but could vary to approach 100% depending on road access, regrading, storm water basins, trenches, compaction, and topsoil removal and replacement. He cautioned against being wooed by "voodoo products" for remediating soil limitations and instead emphasized the importance of processes like tillage to loosen compaction. Professor Daniels listed the issues associated with compaction, such as direct impedance of rooting, enhanced runoff, and impact on seasonal wetness and drought. He shared that for any plant to extend through the soil, it must find continuous pores larger than the actively extending root tip, which is hindered by compaction. He also provided examples from mined land research in Virginia and explained the impact of soil reconstruction compaction on pine tree growth. Professor Daniels suggested ways to address the effects of compaction, such as saving, preserving, and reapplying topsoil, using liberal amounts of lime, P, and organic matter amendments, applying tillage to reconstruct areas, and anticipating a second round of remedial actions needed when old infrastructure is removed after the 20 to 30-year life cycle. He emphasized the need to be transparent with landowners and inform the public that sites face long-term impacts and need remediation at multiple stages. Professor Daniels also discussed the local threat of acid sulfate soils and the importance of recognizing their existence. These soils exist in Virginia's coastal plain and a particularly problematic belt of the Piedmont just west of Fredericksburg and Stafford. In summary, he highlighted that soil compaction of certain areas is inevitable during the construction phase and establishing and maintaining uniform vegetation under certain panel arrays, particularly low fixed panels, can be difficult due to differences in solar loading and soil moisture.

Professor Daniels discussed the challenges of large-scale solar site development and legacy issues, particularly soil considerations. He highlighted different types of soil disturbances such as road construction, trenching for internal cable distributions, and installation of panel arrays, among others. Professor Daniels emphasizes that every site, soil conditions and design are unique.

The committee discussed that while the stockpiling of topsoil for use in the decommissioning of solar facilities is often included as a remediation strategy, it should be noted that, minus the physical, chemical, and biological dynamics of its natural state and function, this material is significantly altered. Prolonged storage, such as that of the projected life cycle of current solar facilities, results in a soil with significantly reduced porosity and permeability, diminished biological activity and distinct changes in its chemical makeup, essentially altering all those characteristics and functions valued in a productive topsoil. However, temporary stockpiling and immediate distribution of topsoil

upon completion of construction and final grading of the site is recommended to achieve site stabilization.

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## View of Energy Right Virginia (August 17, 2022)

Skyler Zunk is the co-founder of Energy Right, a non-profit organization that aims to bring a conservative voice to the energy conversation, with an emphasis on the importance of the decision-making process at the local level. The organization supports clean energy projects that utilize local resources and contractors to set communities up well for the long term, and they support the shaping of projects through sound ordinances and policies. Mr. Zunk notes that solar is relatively new to the rural Virginia landscape, but he hopes to support contract and development tools to aid this cause. Energy Right's mission is to spread awareness of how solar can be a safe neighbor for communities and to provide the tools/support to carry out these projects. The organization plans to hire a field team to educate community members on what solar does and doesn't do. Mr. Zunk states that as a conservative, he supports individual property rights. In theory, he supports placing solar on brownfields or reclaimed mining sites but mentions that these options are not always economical if they are far away from transmission lines and do not benefit the ratepayer. Energy Right is sensitive to prime farmland concerns, but the farmer should have the right to make decisions about his land to provide diversified income for landowners.

During the discussion the point was made that incentives may be appropriate to offset the higher cost to develop solar on brownfields but there needs to be recognition that not all brownfields are the same.

## Local Revenue Implications of Utility-Scale Solar Projects (September 28)

The meeting discussed the local revenue implications of utility-scale solar projects, with presentations by Thomas Blackwell, Essex County Commissioner of Revenue, and Roderick Compton from the Virginia Department of Taxation. Here is a summary of the main points discussed:

- Roderick Compton provided an overview of tax codes related to solar projects. He explained that the biggest question is determining what is taxable and what is not.
- Compton's presentation focused on the Property Tax Guide for Virginia Assessing Officers, which includes advisory aid, education training, code oversight, and studies related to property evaluation.
- Solar projects in Virginia are assessed based on their size and ownership. Independent solar projects less than 25 MW are assessed by localities, while those larger than 25 MW are treated as electrical suppliers and assessed by the State Corporation Commission (SCC) for property tax purposes. Utility-owned solar projects are assessed by the SCC regardless of size.
- Certified pollution control equipment and facilities related to solar projects are exempt from local and state taxes under Article 10, Section 6. The definition of equipment, facilities, and devices is broad and can include various components of a solar energy system, excluding the land.
- The code specifies different tax exemptions and phase-in periods based on the size and date of the project. It can be challenging for localities to determine which parts of a project are taxable due to the complexity and changes in the code.
- There are provisions for revenue sharing between localities and solar projects, depending on the size and interconnection request date. The revenue share option allows localities to exempt projects larger than 5 MW from property tax.
- The SCC values land at local rates, and localities need proper land valuation methods in place. Lease land is valued locally unless owned by a public utility.
- Compton discussed the challenges of determining rates, accessing lease rates, developing capitalization rates, and dealing with administrative issues such as zoning, buffers, decommissioning, and use value.
- Tommy Blackwell presented a case study of a solar facility in Essex County that was 100% tax-exempt because it started before certain limits were imposed. The county did not receive tax revenue from the equipment but would have received a revenue share if eligible.
- Blackwell highlighted the impact of solar projects on local revenue and mentioned challenges such as stormwater runoff issues, fires, and negative coverage. He expressed concerns about the lack of revenue and incentives for the county.
- The meeting discussed the potential impact on Local Composite Index (LCI), which measures a locality's ability to pay for education expenses. It was noted that the long-term impact of solar projects on LCI is uncertain.

- Compton mentioned that administrative costs of revenue sharing can vary for different localities, and exemptions and other factors can complicate the process.

Overall, the meeting focused on the complexities of assessing and taxing utility-scale solar projects, the challenges faced by localities, and the impact on local revenue.

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## Views of Solar Facility Developers (October 26, 2022)

Open Road Renewables is a utility-scale solar development company based in Austin, Texas. They have a multidisciplinary team focused on problem solving and community engagement.

According to Mike Volpe's presentation, the driving factors of Virginia's solar expansion are:

1. Declining cost of solar modules - utility scale solar is now competitive with traditional forms of generation and is 3-4 times less expensive than rooftop solar.
2. Corporate demand - over 370 Fortune 500 companies have 100% renewable energy goals.
3. State and PJM-wide Renewable Portfolio Standards (RPS) demand.
4. Wealth transfer from urban/suburban areas to more rural parts of Virginia, which could be enabled by utility-scale solar.

Mr. Volpe notes that for solar to be economically competitive, it is assumed that there is minimal upgrade work needed for transmission lines. He explains that the way the cost allocation for new generator interconnection is determined, rests on new generators paying for the cost of the upgrade. He also details the lease initiation, transmission studies, and field surveys that are part of the local/state government permitting process.

Mr. Volpe addressed the question of how energy is sent long distances, stating that it is sent virtually and consumed locally. He presents the visual analogy of a bathtub with multiple faucets and multiple drains and displayed a snapshot of the high-voltage transmission system.

Volpe also discussed the concerns around decommissioning, emergency plans, and panel specifications in the permit approval process. He highlights the importance of 2020 legislation that empowers localities to negotiate directly with solar developers to address specific local circumstances on a project-by-project basis.

## **The Views of Dominion Energy (October 26, 2022)**

The perspective of Dominion Energy on renewable energy was presented by Brian Stuver, Manager - Environmental Compliance, and Amelia Boschen, Manager - Environmental Regulations. Dominion is a Fortune 200 company headquartered in Richmond and serves over 2.5 million customers in Virginia. Dominion has reduced their carbon dioxide emissions by 57% since 2005 and committed to net-zero carbon and methane emissions by 2050. The Virginia Clean Energy Act (VCEA) is the most consequential energy policy reform since 2007, and from the solar perspective, this is 16.1 gigawatts by 2035, including 1100 megawatts of small-scale/distributed solar. Dominion has nine active projects under construction at the utility-scale solar size and two distributed projects. The development criteria include environmental considerations, 8-9 "usable" acres per MW of solar, topography, good road and highway access to the site, minimal impacts from shading, access to the electrical system, land purchase or lease (with a term of ~38 years), and consideration/creation of wildlife corridors. Dominion also focuses on community outreach to ensure that the neighbors of the site are aware of everything and allow for open communication channels. Dominion must balance where they can fit distributed as well as utility-scale projects to hit targets for renewable energy. Dual use of land for both solar energy and agriculture is a consideration, and sheep grazing can be used for rotational grazing in these projects.

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## **Views of Old Dominion Electric Cooperative (November 16, 2022)**

Stephanie Kane, the head of the Government and External Affairs branch of the Old Dominion Electric Cooperative (ODEC), discussed the company's goals, generation mix, emissions goals, solar power projects, and policy concerns. ODEC is a not-for-profit electric cooperative that serves 15 companies. The company was the first in Virginia to explore community solar and has an application under the 2017 Community Solar Act. The company has a net-zero carbon goal and plans to reduce carbon intensity by 50% by 2030. They have utility-scale solar purchase power agreements in Clarke, Northampton, and Halifax Counties and put out a competitive RFP and selected a company named EDF Renewables for distributed solar in 2019. Ms. Kane emphasizes that options to build out solar include ODEC putting out an RFP, working with the National Renewables Cooperative Organization (NRCO) to put out an RFP, or solar developers reaching out directly to NRCO. ODEC faces challenges in building out solar both at the state level and the PJM level, including difficulties in the last two years since COVID, economic impacts from Russia's invasion of Ukraine, and inflation. There are issues between stakeholders in Virginia relating to preserving agricultural land, and Ms. Kane mentions that many rural counties do not feel equipped to handle what is coming. Some of ODEC's key policy concerns include reaching sustainability goals and moratoriums on solar projects in some counties.

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## Conclusions – Points of Agreement and Conflict; Key Considerations for Decision Makers; and Best Policy Practices in the Development of Utility Scale Solar Facilities

While there are points of conflict, there are several points of agreement among the different viewpoints presented:

### 1. Importance of Renewable Energy:

- All perspectives acknowledge the importance of renewable energy, particularly solar power, to reduce carbon emissions and promote sustainable energy generation.

### 2. Cost Competitiveness of Solar and Increasing Demand

- Multiple viewpoints recognize the declining cost of solar modules, making utility-scale solar increasingly competitive with traditional forms of energy generation. This cost competitiveness is seen as one important market-driver for solar expansion. The dramatic increase in demand for renewable energy by the fast-growing data center sector is also an important market-driver.

### 3. Environmental Considerations:

- Various perspectives emphasize the need to consider environmental factors when developing solar projects. This includes minimizing soil disturbance, preserving agricultural and forestal land, and protecting wildlife corridors.

### 4. Community Engagement and Communication:

- Several organizations stress the importance of community outreach and engagement, ensuring that neighbors and local communities are informed about solar projects and allowing for open communication channels.

### 5. Policy Reforms and Regulations:

- Perspectives highlight the significance of policy reforms and regulations in promoting renewable energy. The Virginia Clean Energy Act (VCEA) is recognized as a consequential energy policy reform, and the importance of legislation empowering localities to negotiate directly with solar developers is emphasized (Code of Virginia Section 15.2-2316.6 through 15.2-2316.9).

### 6. Carbon Emission Reduction Goals:

- Dominion Energy and ODEC both have carbon emission reduction goals, aiming for net-zero carbon or significant carbon intensity reduction by specific target years. This aligns with the broader goal of reducing greenhouse gas emissions and addressing climate change.

These points of agreement highlight common ground in the recognition of renewable energy's importance, cost competitiveness of solar, environmental considerations, community engagement, important policies, and the need to reduce carbon emissions.

Building upon these areas of agreement can foster collaboration and progress in the development of solar energy.

While there are common themes and shared goals among the different perspectives presented, there are also points of conflict and differing viewpoints. Here are the key points of conflict:

1. Perspectives on Land Use:

- Professor Daniels highlighted the importance of minimizing soil disturbance and the need for remediation. This may conflict with the interests of solar developers seeking large-scale projects that require significant land area.
- Skyler Zunk supports solar development on brownfields and reclaimed mining sites, while Dominion Energy and ODEC focus on utility-scale solar and land criteria. There may be conflicts in determining the most suitable land for solar projects, considering factors such as agricultural and forestal land preservation, local capacity, and economic viability.

2. Approaches to Solar Development:

- Open Road Renewables and Dominion Energy focus primarily on utility-scale solar projects, while Energy Right and ODEC place degrees of emphasis on community and distributed solar projects. These different approaches may result in different priorities and strategies for solar development.

3. Policy Concerns and Local Regulations:

- Energy Right expresses concerns about policy challenges at the state and local levels and supports individual property rights. This may conflict with Dominion Energy's policy concerns regarding moratoriums on solar projects in some counties.
- ODEC highlights challenges at the state and PJM level, including economic impacts and conflicts over land use. These challenges may differ from the perspectives presented by other organizations and individuals.

4. Balance Between Solar and Other Energy Sources:

- While there is a general emphasis on renewable energy, perspectives may differ on the balance between solar and other energy sources. Dominion Energy, for example, serves over 2.5 million customers and may feel pressure to consider a mix of renewable and non-renewable sources to meet the energy needs of their customer base. Is nuclear a viable option for the future.

These conflicts reflect differing priorities, approaches, and considerations among stakeholders involved in solar energy development. Resolving these conflicts often requires careful evaluation, collaboration, and balancing of various factors such as environmental impact, economic viability, policy frameworks, and community concerns.

State policy expressed through the VCEA is the major policy driver of the demand for large projects. State authorization for site by site negotiated local agreements is the major policy enabler facilitating projects that can appropriately consider the key areas of agreement while balancing conflicting interests.

Based on the information provided, here are some potential best policy practices that can be derived from the perspectives shared:

1. Inclusive Community Engagement:

- Emphasize the importance of community engagement and outreach to ensure transparency, address concerns, and promote open communication channels. This can help build trust and support for solar projects among local residents.

2. Take a Broad view to Solar Project Development:

- Adopt a flexible approach to project development, considering various options such as utility-scale solar, distributed solar, and community solar. This allows for a diversified mix of solar projects to meet different needs and preferences.

3. Environmental Considerations:

- Incorporate environmental considerations into solar project development by preserving agricultural land, creating wildlife corridors, and minimizing and ameliorating soil disturbance. This helps protect ecosystems and natural resources while promoting sustainable energy generation.

4. Policy Reforms to Empower Localities:

- Support and enhance previous policy reforms that empower localities to negotiate directly with solar developers, taking into account specific local circumstances and concerns. This allows for tailored solutions and greater involvement of local stakeholders in decision-making processes.

5. Appropriateness of Transmission Upgrades:

- Siting decisions should minimize the need or impact of transmission line upgrades. This lessens community impact and enhances economic competitiveness for solar projects. Ensuring minimal upgrade work is needed for transmission lines can help reduce project costs and promote solar's economic viability.

6. Capitalize on Expertise and Past Experience:

- Engage and collaborate with recognized experts to benefit from the experience and learning that has occurred as solar project development has grown over the past decade. This can enhance the efficiency and effectiveness of project planning and implementation.

These "best policy practices" aim to promote effective community engagement, environmental stewardship, policy reforms, cost competitiveness, and collaboration,

creating a conducive environment for the successful deployment of solar energy projects.

### Some Key Questions/Considerations for Decision Makers

- Should your local ordinance limit amount of land disturbance at any one time?
- Should industrial land be prioritized for solar development to protect prime ag and forest land? Or
- Should industrial land be off limits to maintain it for other economic development, especially if water/sewer/power/transportation infrastructure is in place to support traditional industrial site development.
- Should there be jurisdiction-wide restrictions on the percentage of agricultural or forest land converted?
- Look to existing site suitability mapping resources - at the statewide scale, studies indicate there is adequate acreage to meet the demands for renewable energy development and adequately protect conservation resources (see Important Resources in the final section of this document).
- Should your ordinance give preference to smaller projects and/or prohibit projects over a certain size?
- Do you have the staff resources to adequately evaluate proposed projects and inspect after approval? Can you require solar developers to financially support staff augmentation?
- Have you included renewable energy goals or policies in the Comprehensive Plan?
- Does your ordinance provide a clear regulatory path for approval?
- Project evaluation should include consideration of water quality impacts (Chesapeake Bay goals).
- Should local regulation prioritize protection of Class 1 and Class 2 soils?
- Do your regulations allow for (or encourage) a variety of solar types, including distributed (rooftop), community-scale and utility-scale.
- Do you require active community engagement?
- Does post-construction site stabilization include reapplication of temporarily stockpiled topsoil and native plant cover?
- Do you prohibit or discourage development in wetlands, floodplains and Resource Protection Areas (RPA) or similar land features when outside Chesapeake Bay Preservation Area localities.
- Assessment and taxing are complex - involve your Commissioner of Revenue and the resources at the Virginia Department of Taxation. Consider the different options authorized including host agreements which allow direct negotiations to address local circumstances and concerns on a project-specific basis.
- Are local regulations mindful of environmental justice concerns?
- As you consider all aspects of a project be mindful of the inherent tradeoffs.

- Can a project include multiple uses such a pollinators, grazing or crops? (Agrivoltiac)
- Are wildlife impacts considered and addressed in project analysis?
- Does your ordinance address protection of historical and cultural resources?

### Important Resources

TNC Mapping (project suitability) -

<http://conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/virginia/Pages/solar-siting-va.aspx>

ConserveVirginia - <https://www.dcr.virginia.gov/conservevirginia/>

Virginia Land and Energy Navigator - <https://valen.ext.vt.edu>

DEQ Permit-By-Rule Resource Map - <https://www.deq.virginia.gov/permits/renewable-energy/renewable-energy-project-status>

USDA Forest Service i-Trees <https://www.itreetools.org/tools>

Brightfields (old mining sites) <https://www.deq.virginia.gov/our-programs/land-waste/land-remediation/brownfields/brightfields>

SolTax, a tax tool <https://energytransition.coopercenter.org/soltax-tool>

Overview of Solar Development in Virginia

[https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/virginia\\_energy\\_solar\\_development\\_in\\_va.pdf](https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/virginia_energy_solar_development_in_va.pdf)

Virginia Renewable Energy Facilities Task Force Final Report (HB774/SB499 2022)

<https://scc.virginia.gov/getattachment/fc94c12e-c0fa-49a2-8877-2ad501ab3dc9/VA-Renewable-Energy-Task-Force-Final-Report.pdf>

Property Tax Guide for Virginia Assessing Officers (presentation)

[https://rrbcnews.files.wordpress.com/2023/05/rrbc\\_2022-1.pdf](https://rrbcnews.files.wordpress.com/2023/05/rrbc_2022-1.pdf)

American Farmland Trust, Planning for Agriculture

<https://farmland.org/project/planning-for-agriculture/#:~:text=Planning%20for%20agriculture%20creates%20a,for%20current%20and%20future%20generations.>

Virginia Pollinator Smart <https://www.dcr.virginia.gov/natural-heritage/pollinator-smart>

Agrivoltaics [https://ratedpower.com/blog/benefits-agrivoltaics-examples/?utm\\_term=&utm\\_campaign=English+-+DSA+-+BlogPosts&utm\\_source=adwords&utm\\_medium=ppc&hsa\\_acc=7729797172&hsa\\_cam=16456307909&hsa\\_grp=144462966664&hsa\\_ad=603380135931&hsa\\_src=g&hsa\\_tgt=dsa-1670499507082&hsa\\_kw=&hsa\\_mt=&hsa\\_net=adwords&hsa\\_ver=3&gad=1&gclid=EAlaIQobChMI8qfwj\\_vW\\_wIVE4jICh2AiALPEAAYASAAEgJnp\\_D\\_BwE](https://ratedpower.com/blog/benefits-agrivoltaics-examples/?utm_term=&utm_campaign=English+-+DSA+-+BlogPosts&utm_source=adwords&utm_medium=ppc&hsa_acc=7729797172&hsa_cam=16456307909&hsa_grp=144462966664&hsa_ad=603380135931&hsa_src=g&hsa_tgt=dsa-1670499507082&hsa_kw=&hsa_mt=&hsa_net=adwords&hsa_ver=3&gad=1&gclid=EAlaIQobChMI8qfwj_vW_wIVE4jICh2AiALPEAAYASAAEgJnp_D_BwE)

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