January 1, 2022

CLEAN ENERGY ADVISORY BOARD
2021 ANNUAL REPORT

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Executive Summary

In 2019 the Virginia General Assembly passed HB 2741 establishing the Clean Energy Advisory Board (the "Board") as an advisory board in the executive branch of the state government. The stated purpose of the Board is to establish a program (the "Program") for disbursing loans or rebates for the installation of solar energy infrastructure that will benefit low-income and moderate-income households through the "Low-to-Moderate Income Solar Loan and Rebate Fund" ("LMI Solar Fund"). The enabling legislation requires the Board to prepare and submit to the Governor and the General Assembly an annual report for publication as a report document.

Since the passage of the Virginia Clean Economy Act, Virginia has been working to fundamentally transform the Commonwealth's electricity generation and grid. The Board's mission is to ensure that low-to-moderate income ("LMI") Virginians are not left behind in this energy transition.

This year the Board has continued to explore how to create a sustainable Program which will expand cost-effective solar energy opportunities to reduce energy burdens and increase access to clean electricity for LMI communities across Virginia. The Board and staff from the Virginia Department of Energy ("Virginia Energy") conducted national and state program research, worked closely with the Clean Energy States Alliance on Program design, participated in stakeholder meetings regarding low-income participation in shared solar facilitated by staff at the State Corporation Commission (the "Commission") and Virginia Energy, and consulted with all three of the investor-owned utilities in the Commonwealth on solar programs for low and moderate income customers.

The COVID-19 pandemic has exacerbated existing inequities, leaving an unprecedented number of utility customers with arrearages, and demonstrating the need to reduce high energy burdens. Solar energy technology, paired with energy efficiency measures, has been proven to reduce electricity expenses while also supporting clean energy goals.

The Board is committed to launching a sustainable LMI Solar Fund to serve those who can benefit the greatest from solar installations. Designees of the Board will work closely with Virginia Energy to issue a Request for Proposals ("RFP") in the first quarter of 2022 in order to select a financing and solar installation partner for a pilot program that is a precursor to the Program. The issuance of this RFP will represent a significant milestone in the progress toward implementing the Program. The Board hopes 2022 will bring additional opportunities to continue to expand its work as it has become even more important.

Mission Statement

The Board adopted the following mission statement in 2019 which guides the Board's work:

> *The Clean Energy Advisory Board (the Board) is established as an advisory board in the executive branch of state government. The Board, with the approval of the Director [of the Virginia Department of Energy], shall develop and establish a Low-to-Moderate Income Solar Loan and Rebate Pilot Program (the Program) and rules for the loan or rebate application process. The Program shall disburse loans or rebates for the installation of solar energy infrastructure from a Low-to-Moderate Income Solar Loan and Rebate Fund (the Fund). In carrying out its duties, the Board shall consider the Energy Objectives of the Commonwealth described in § 67-101 of the Code of Virginia. All actions and recommendations of the Board shall be for the purpose of expanding access to cost-effective clean energy for low- and moderate-income Virginians throughout the Commonwealth, including citizens living in both single- and multi-family housing facilities and in rural or economically disadvantaged communities.*

See Appendix A for the Board's bylaws and Appendix B for the Section in the Virginia Code (the "Code") which established the Board and the LMI Solar Fund.

Current Board Members

Pursuant to its enabling legislation the Board shall have a total membership of seventeen members. At the time of this report the Board has one vacancy. This vacancy is reserved for an attorney with the Division of Consumer Counsel who shall be appointed by the Governor. This seat has been vacant since November 5, 2021. The Board members' term limits are reflected in Appendix C as well as additional board seat details.

The current Board Members are:

- Carmen Bingham
- KC Bleile
- Katharine Bond
- Taylor Brown
- Sam Brumberg
- Janaka Casper
- Will Cleveland
- Hannah Coman, Chair
- Kendyl Crawford
- William Greenleaf, Vice Chair
- Kirk Johnson
- Susan Kruse

- Sarah Nerette
- Toni Ostrowski
- William Reisinger
- John Warren *(ex officio)*

Public Meetings

A portion of the Board's 2021 activities occurred during the Commonwealth's COVID-19 State of Emergency. Executive Order Fifty-One, "Declaration of a State of Emergency Due to Novel Coronavirus (COVID-19)" was announced on March 12, 2020, and remained in place through June 30, 2021. During the State of Emergency, the public meetings of the Board and its Committees were conducted electronically through the Webex virtual platform in accordance with the Commonwealth's public meeting guidance.

At the Board's October 20, 2021 meeting, the Board amended its existing policy on Board members participating in meetings by electronic means due to a medical/disability issue or a personal issue, and adopted a new policy pursuant to authority in the budget bill passed during the 2021 Special Session II of the General Assembly. Specifically, the Board's Policy on Individual Participation in Clean Energy Advisory Board Meeting by Electronic Means Pursuant to § 2.2-3708.2, reflects amendments to that section of the Code that were made during the 2021 General Assembly. The Board's Policy on Meetings of the Clean Energy Advisory Board Pursuant to Enactment 17 of Chapter 1 of the 2021 Special Session II Acts of Assembly allows the Board and its Committees to meet by electronic means without an in-person quorum if the meeting is for informational purposes only and no votes will be cast.

The Board held a total of six meetings in 2021. In addition, the Program Development Committee and the Stakeholder Engagement and Marketing Committee each met once. The newly formed Policy and Regulatory Committee met twice in person. Each meeting was publicly noticed through Virginia Town Hall and meeting materials were posted or linked on Virginia Energy's public-facing website (found here). Meetings were recorded, and public meeting protocols were adhered to accordingly.

2021 Meeting Summary

Minutes and Agenda are posted on Town Hall. Where available, links to the meeting recording can be found on the meeting minutes document. Most presentations (if any) are included in the Agenda. The following is a list of all Board and Committee meetings held in 2021:

Board Meeting: ***3/24/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?meetingid=32270

Board Meeting: ***7/21/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=32703

Board Meeting: ***10/20/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=33231

Board Meeting: (IOU Consultations)*: ***11/3/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=33308

Board Meeting: (Green Bank Presentation)*: ***11/5/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=33322

Board Meeting: (Low income solar program update)*: ***11/15/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?meetingid=33350

Board Meeting (Year-End Annual Meeting): ***12/15/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=34458

**These Board meetings were held virtually for informational purposes and no votes were cast.*

Policy and Regulatory Committee Meeting: ***9/13/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?meetingid=33009

Policy and Regulatory Committee Meeting: ***11/9/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=33327

Program Development Committee: ***2/24/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=32183

Stakeholder Engagement and Marketing Committee: ***2/26/21***
- https://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=32191

Program Research

In addition to hearing input from members of the public and working with partner state agencies,

Virginia Energy and members of the Board engaged in extensive conversations on LMI solar program design and development topics with subject matter experts from across the country. This list of experts included, but is not limited to, researchers, executives and program managers at: Clean Energy States Alliance, North Carolina Clean Technology Center, Connecticut Green Bank, Sunrun, PosiGen, AltEnergy, GRID Alternatives, Solar United Neighbors and Energy Trust of Oregon. Virginia Energy staff also presented to the Board on a variety of topics for consideration, including "green banks."

The Board and Virginia Energy will continue to look for opportunities to learn from individuals, agencies and organizations both within Virginia and from other states or regions that have information that can support the mission of the Board and the successful launch of the LMI Solar Fund.

Energy Burden Landscape in Virginia

The Board's mission to expand access to cost-effective clean energy for low- and moderate-income Virginians throughout the Commonwealth continues to be necessary and important work. The country at large faces challenging inequities in historically economically disadvantaged communities ("HEDCs"), which in Virginia include communities of color, communities in fossil fuel impacted regions such as Southwest Virginia's coalfield region of Appalachia, veteran communities, native communities, and low-income communities.

Recent analysis of households using electric heat in Virginia showed 34,603 owner-occupied single family homes with an annual income of 80 percent or less of the area median income (AMI) and an energy burden of 11 percent or greater (See Appendix D). These LMI households are using a significant amount of their income on energy and would be eligible to participate in the Program.
In 2020, Virginia Energy (then "DMME") conducted this analysis using the U.S. Department of Energy's Low-income Energy Affordability ("LEAD") Tool (See Appendix D). The recommended percentage of energy expenditure to income ratio, or "energy burden," that should be considered affordable caps at 10 percent if a household is using electricity for heating, or 6 percent for households using non-electric heat such as gas, propane, or other fuels. When considering all single family households within the 0-80 percent AMI income levels, regardless of ownership or heat source, and an energy burden greater than 6 percent, Virginia has over 665,000 households, averaging $2,375 in energy costs, or $197 per month. Furthermore, over 1 million housing units in Virginia are at or below the 80 percent of AMI.

Electric bills are higher for LMI single-family homeowners than state averages for a variety of reasons. Again, according to Virginia Energy analysis using the LEAD tool, households under 80 percent AMI are paying a higher average electricity bill than overall averages as seen in Dominion Energy ("Dominion") or Appalachian Power Company ("APCo") service territories. Average electric monthly bills in Dominion territory are $115 per month, and $110 per month in APCo. Conversely, LMI single family households see the following average electricity bills, by income:

- AMI 60-80% = $1,625 ($135/month)
- AMI 30-60% = $1,538 ($128/month)
- AMI 0-30% = $1,530 ($128/month)

Numerous programs in Virginia are working to reduce energy burdens for LMI customers, bringing more options to create energy equity. Virginia Energy and members of the Board will work with the Department of Housing and Community Development ("DHCD"), State Corporation Commission (the "Commission"), Dominion, and other agencies and utilities to set up programs that have this mission in common. In 2020, the Commonwealth of Virginia became the first southern state to join the Regional Greenhouse Gas Initiative ("RGGI"), a regional cap and trade program designed to reduce climate pollution from fossil fuel power plants. Legislation passed by the Virginia General Assembly authorizes proceeds from these auctions to be used for community flood preparedness, coastal resilience and energy efficiency programs for affordable housing. DHCD will administer approximately 50% of the auction proceeds through a new program called Housing Innovations in Energy Efficiency ("HIEE"), with technical assistance from Virginia Energy.

Other programs that help address energy burdens for select ratepayers in the Commonwealth include the Percentage of Income Payment Program ("PIPP")[1]; access to Shared Solar (Code § 56-585.1:3) and Multi-family Shared Solar (Code § 56-585.1:12) subscription programs; and investor-owned utility LMI solar and energy efficiency programs (Code § 56-585.1:2).).

The energy burden numbers referenced in the LEAD tool will likely increase in the short term as data points get updated through the Census Bureau's American Community Survey, capturing the harsh economic reality facing millions of American households who have felt the recent COVID-19 crisis in the form of lost jobs and other economic disparities.

[1] This is a program outlined in Code 56-585.6 established by the Virginia Clean Economy Act that will cap the monthly electric utility payment of low-income participants at six percent, or at 10 percent if the participant's home uses electric heat, of the participant's household income.

2021 Legislative Actions and Policy Update

The Board continues to monitor legislative amendments and regulatory proceedings that affect renewable energy development in the Commonwealth. Energy policy in Virginia is complicated as it varies greatly based on the customer's location. The Commonwealth is divided into different utility territories, as shown in Appendix E, and depending on where a customer lives and which utility serves them, different opportunities for energy efficiency or renewable energy programs may be available.

The Commonwealth's energy policy has undergone significant changes since 2020. The General Assembly passed several bills during the 2020 Regular Session that expanded renewable energy development in Virginia, including the Virginia Clean Economy Act ("VCEA") (Code §§ 56-576, 56-585, 56-594 and 56-596.2) and the Solar Freedom Bill (Code §§ 56-585.1:12, 56-594 and 67-102). The General Assembly also established a Shared Solar program in Dominion's territory (Code § 56-593.3). The Commission continues to implement the VCEA, the Solar Freedom Bill, and the Shared Solar and Multi-Family Shared Solar legislation through rulemakings and other formal proceedings at the Commission.

VCEA

The VCEA, among other things, established a mandatory renewable portfolio standard ("RPS") for Virginia's two largest electric utilities. The RPS requires Dominion and APCo to obtain an increasing percentage of their electricity sales from renewable energy sources. The VCEA also requires Dominion to procure a certain percentage of its RPS energy from low-income qualifying projects. The law provides that 1% of Dominion's annual RPS compliance must be satisfied with renewable energy credits ("RECs") from distributed generation facilities like rooftop solar and, moreover, that 25% of such distributed generation RECs should be obtained from "low-income qualifying projects." Code § 56-585.5 defines a low-income qualifying project as one that "provides a minimum of 50 percent of the respective electric output to low-income utility customers." Code § 56-576 defines "low-income utility customers" as "any person or household whose income is no more than 80 percent of the median income of the locality in which the customer resides."

After an evidentiary hearing process, the Commission approved the initial VCEA RPS development plans filed by Dominion (SCC Case No. PUR-2020-00145) and APCo (SCC Case No. PUR-2020-00135). As part of its final order in the Dominion proceeding, the Commission directed Dominion to

convene a stakeholder group to evaluate the low-income project qualifying carveout in the RPS. The stakeholder group convened in August of 2021 and continued to work through November. In particular, the stakeholders agreed that at least two categories of projects would qualify. First, the stakeholders agreed that behind-the-meter solar facilities that provide power directly to low-income customers would qualify. This scenario could be a solar facility located on the premises of a low-income multifamily housing complex. Second, the group agreed that facilities may qualify as "low-income qualifying projects" if they supply a minimum of 50% of their output to "low income utility customers" who have subscribed to the facilities. The Commission will evaluate the recommendations of the stakeholder group in Dominion's pending RPS proceeding (SCC Case No. PUR-2021-00146).

The Commission will hold an evidentiary hearing regarding Dominion's second VCEA RPS development plan in SCC Case No. PUR-2021-00146. As of December 1, 2021, APCo's second VCEA RPS development plan has not yet been filed.

Investor-Owned Utility Net Metering Amendments

Virginia's net energy metering law was also amended in 2020. In particular, the Solar Freedom Bill expanded Virginia's cap on net energy metering from 1% to 6% of each utility's Virginia peak load. 1% of the available net metering capacity is reserved for "low-income utility customers." In March of 2021, the Commission adopted regulations to implement the revised net metering program, including the low-income carveout. (See SCC Case No. PUR-2020-00195). The updated net metering regulations are found in Section 20 VAC 5-315-20, et seq., of the Virginia Administrative Code.

Investor-Owned Utility Shared Solar

Many residential and non-residential electricity customers face significant challenges to installing rooftop solar, including: up-front and maintenance costs of the system; suboptimal roof orientation or structural constraints; and shading from trees or other buildings. For renters, residents of multifamily buildings, homeowners with roofing or shade issues, and low-to-moderate income customers, shared solar programs address these obstacles and offer customers the opportunity to invest in solar in a way that fits their budgets, and derive some of the benefits (such as lowering monthly electric bills and energy burdens), while a third-party is responsible for building and maintaining the solar facility and ensuring the benefits are attributed to participating customers. As a result, the Board has been closely following developments in shared solar and community solar

throughout the Commonwealth.

The 2020 General Assembly passed Senate Bill 629 (Code § 56-594.3), allowing Dominion customers of all classes to subscribe for a specific amount of electricity generated by a solar facility to offset their energy usage from their utility (the "Shared Solar Program"). Pursuant to the legislation, the Commission must establish a minimum bill for all subscribers to pay, except for low-income customers; thereby providing important access to solar for low-income customers. The Board provided comments in 2020 to the Commission regarding the proposed regulations for the Shared Solar Program. (SCC Case No. PUR-2020-00125 (the "Shared Solar Docket")).

The Commission held an evidentiary hearing on November 18, 2021, regarding Dominion's minimum bill for Dominion's Shared Solar program. The Commission heard testimony and argument from Dominion, the Commission staff, solar advocates, and other parties, regarding the appropriate level at which to set the minimum bill. The Commission has not yet finalized the regulations that will govern the Shared Solar Program.

Finally, the Solar Freedom Bill also established a program for Dominion and Old Dominion Power (Kentucky Utilities) ("ODP") customers living in multi-family housing to subscribe for a specific amount of electricity generated by a solar facility to offset their energy usage from their utility ("Multi-Family Shared Solar Program"). In 2020, the Board provided comments to the Commission regarding the proposed regulations for the Multi-Family Shared Solar Program. (SCC Case No. PUR-2020-00124). The Commission has not yet finalized the regulations that will govern the Multi-Family Shared Solar Program.

Low Income Stakeholder Working Group for Shared Solar and Multi-Family Shared Solar for Investor-Owned Utilities

In accordance with the Commission's December 23, 2020[2] order in the Shared Solar Docket, the Commission staff and Virginia Energy facilitated stakeholder meetings in 2021 to address certain components of the Dominion shared solar program and the Dominion and ODP multi-family shared solar program for low-income subscribers, specifically, the low-income subscription plans, methods for low-income verification, and methods for measuring low-income participation. Chair Coman participated in these stakeholder meetings in her role as Chair of the Board. The stakeholder meetings resulted in two reports both entitled Low Income Stakeholder Working Group Reports on

[2] Order Adopting Rules, Dec. 23, 2020, State Corporation Commission, Case No. PUR-2020-00125, *available at*: 4qxr01!.PDF (virginia.gov).

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the Virginia Shared Solar and Multi-Family Shared Solar Programs (2020 - 2021) dated April 22, 2021[3] and September 30, 2021[4] (each a "WG Report" and together, the "WG Reports"). In its July 23, 2021 order,[5] the Commission accepted, with minor clarifications, the standardized consumer disclosure form and the form addressing components of the low-income subscription plan from the WG Report dated April 22, 2021. Both WG Reports reflect valuable input from low-income stakeholders and the Board hopes that the recommendations set forth in the WG Reports, specifically the income verification recommendations for low-income programs, can be used to inform other low-income programs.

Technical Assistance from Clean Energy States Alliance

Clean Energy States Alliance

The Clean Energy States Alliance ("CESA") has provided technical assistance to both Virginia Energy, as a member organization, and the Board.

CESA is a national, nonprofit coalition of public agencies and organizations working together to advance clean energy. CESA members—mostly state agencies—include many of the most innovative, successful, and influential public funders of clean energy initiatives in the country.

CESA works with state leaders, federal agencies, industry representatives, and other stakeholders to develop and promote clean energy technologies and markets. It supports effective state and local policies, programs, and innovation in the clean energy sector, with emphasis on renewable energy, power generation, financing strategies, and economic development. CESA facilitates information sharing, provides technical assistance, coordinates multi-state collaborative projects, and communicates the positions and achievements of its members.

CESA received anonymous funding to assist Virginia Energy and the Board in the development of a pilot program (the "Pilot Program") to test the viability of the Program established by the enabling legislation. The Pilot Program will assist single-family, low-income homeowners in the financing and installation of solar energy infrastructure. The Pilot Program will be limited by budgetary constraints

[3] Staff Update and Shared Solar Working Group Report, April 22, 2021, State Corporation Commission, Case No. PUR-2020-00125, *available at:* 4t5_01!.PDF (virginia.gov).
[4] Staff Update and Shared Solar Working Group Report, September 30, 2021, State Corporation Commission, Case No. PUR-2020-00125, *available at*: 5pk201!.PDF (virginia.gov).
[5] Order for Notice and Hearing, July 23, 2021, State Corporation Commission, Case No. PUR-2020-00125, *available at*: 59tb01!.PDF (virginia.gov).

and certain statutory constraints set forth in Code § 45.2-1912-1917. The aim is to develop a Pilot Program within these limitations that can be scaled and will demonstrate the case for long-term program investment and expansion.

Pilot Program Design

Based primarily on the work of the Program Development Committee in 2020, the Board provided the following initial information to CESA.

Funding

Through CESA, the North Carolina Clean Technology Center modeled small photovoltaic ("PV") system costs and outputs in three distinct locations and different utility service territories in Virginia. This data will also be helpful in determining how the program can best be structured to be advantageous to LMI customers.

Loans

There are several advantages to loan programs from a program administration standpoint (including that a bank provides the capital and is responsible for income verification and loan servicing), however there are a number of challenges that limit their effectiveness. The conclusion, which was confirmed through providers, is that even if the interest rate is subsidized to 0%, it is unlikely to generate much uptake because low-to-moderate income customers may not wish to take on more debt, particularly during the COVID-19 associated economic downturn, and the system does not become cash flow positive for the customer until the loan is fully paid off (in other words, the energy generated by the PV system will not necessarily offset the loan payments from day one).

Rebates and Incentives

From the Board's research and conversations with several low-to-moderate income solar program implementers, it is clear that a potential drawback to a direct incentive to the customer is adverse tax implication. For example, if the program provided a $12,000 incentive directly to the customer this would have to be reported as income for purposes of federal and state income taxes, and could lead to increased income tax liability. A rebate program would require the customer to purchase the system first, then apply for a rebate. The general understanding is that low-to-moderate income customers would not likely have cash on hand to purchase a system in the first place, which limits feasibility of this option. There is potential that a "voucher" type incentive could overcome these issues, similar to electric vehicle "on the hood" incentives that immediately reduce the cost burden.

Solar Leases

Based on the Board's research, solar leases are not currently offered by solar companies in Virginia though they are prevalent in other states. The Board flagged this issue for CESA's consideration.

Another potential model could be to have the Program provide funds through contracts with solar installers, who would agree to install the systems on behalf of the customers. There would be some administrative costs for the installers, so not all costs would go directly to the cost of the system, but this avoids the potential tax implications to the customer.

Customer Eligibility

There are several provisions regarding eligibility for the Program in the Board's enabling legislation.

Income eligibility

The enabling statute requires eligibility for all Virginians with incomes up to 80% area median income ("AMI") or state median income ("SMI"), whichever is greater. Relying on other income-qualified programs as a proxy qualification process generally makes sense and avoids unneeded duplication of efforts on income verification, however, many of the affiliated programs in this space cap at the 60% of AMI (or SMI) and therefore would not cover the 60-80% range that is included in this program. For example, Weatherization Assistance Program ("WAP") income guidelines follow the state Low-Income Heating Assistance Program ("LIHEAP") limit of at or below 60% of SMI for households of seven or less; 200% of Federal Poverty Level ("FPL") if the household is larger than seven. A menu of options should be considered to verify income eligibility, similar to recommendations made by the Board to the Commission for verifying shared solar eligibility.

Reduction in energy consumption

The Board's enabling legislation also requires a 12% reduction in energy consumption due to energy efficiency as a prerequisite for eligibility. This could be an obstacle for program development due to the difficulty in ascertaining whether the 12% reduction has been achieved. A more effective measure should be considered.

For low-income customers who qualify for WAP, Virginia Energy and the Board recommend using WAP program audits and final work scopes with a Savings to Investment Ratio (SIR) of greater than 1.0 for energy efficiency measures as a proxy for the 12% reduction in energy consumption required in the Virginia Code to qualify WAP customers for eligibility under the LMI Solar Fund. A reasonable interpretation of the Code allows for a reduction to be measured in terms of dollar cost savings, so

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that both electric and fuel savings can be included and stated as a single metric. Coordination would need to occur between Virginia Energy, WAP providers and solar installers to ensure customer qualifications and home or building meets SIR minimum requirement.

For moderate-income customers with new construction and substantial renovations, the Home Energy Rating System ("HERS") index (as determined by a credentialed HERS Rater) provides a straightforward pathway to determine if the home will meet the 12 percent energy consumption reduction, as required in Code § 45.2-1917.. The Board recommends using the HERS index, pre- and post-retrofit, as conducted by a qualified HERS Rater to determine eligibility. Similar to the WAP audit, the HERS Rater will conduct a pre-retrofit evaluation. This will include evaluation of the existing energy components (HVAC, insulation, lighting, appliances, etc.) and may include performance testing, such as using a blower door test to determine the envelope air-leakage rate in the home. After renovation, the HERS Rater will conduct a final inspection and test to determine how much energy efficiency improvement is expected based on energy modeling. For example, if the home's HERS index is 150 pre-renovation and 100 post-renovation, this shows a 50% reduction in projected annual energy cost and would qualify the customer for participation in the LMI Solar program.

CESA Pilot Program Recommendations

Based on this initial research from the Board and CESA's own research, CESA delivered a presentation and accompanying report entitled Market Research for Developing a LMI Solar Pilot Program in Virginia, attached hereto as Appendix F, at the March Board meeting. The report contains findings about promising Pilot Program structures; the level of public subsidy necessary to ensure meaningful financial benefits for participating LMI homeowners derived by the North Carolina Clean Energy Technology Center market assessment research; the scope of the Pilot Program; variables for selecting potential Pilot Program locations; and statutory considerations relating to program design.

In July, CESA presented recommendations to the Board for the design of a Pilot Program in Virginia — including a list of potential locations to focus marketing and program design specifications for the Board's consideration. Although the Pilot Program will be open to all eligible Virginians in accordance with the enabling legislation, CESA recommended focusing the marketing campaigns in a few underserved communities. In addition, CESA recommended not dictating the program structure yet since there were several potential program structures, including solar leases, which could be cash-flow positive for customers based on CESA's analysis.

CESA's presentation to the Board included key program design recommendations including:

1. Focus on low-income single-family homeowners who have already qualified for weatherization assistance (at 60% AMI or SMI in Virginia) to streamline eligibility verification;
2. Issue a competitive, open-source solicitation to select solar companies and financing partners to participate in the Pilot Program;
3. Use focused, community-based marketing campaigns to reach 2-3 selected underserved Virginia communities; and
4. Guarantee that solar projects are structured with cash flow positive contracts for participating low-income households that demonstrate bills savings and system performance guarantees.

At the July meeting, the Board voted unanimously for CESA, in collaboration with Virginia Energy, to proceed with preparing a draft solicitation to select solar companies and financing partners to deliver low-cost, long-term solar financing and installation services to qualifying LMI households.

In October, CESA presented the top 5 potential locations for the community-based marketing campaigns: Wise County, Augusta County, the City of Waynesboro, Shenandoah County, and the City of Franklin. To assist the Board and Virginia Energy in refining the list to two or three communities, CESA helped develop questions to assist the Board in its stakeholder outreach.

With input and guidance from Virginia Energy, CESA has prepared a draft solicitation for the Pilot Program. The solicitation will take the form of an open-ended RFP. CESA's draft RFP is currently under review by Virginia Energy and is not yet publicly available. Virginia Energy expects to release it in early 2022.

Pilot Program Funding

While the LMI Solar Fund does not yet have a sustainable source of revenue to allocate toward low-to-moderate income solar financing projects, the Board and Virginia Energy have identified numerous opportunities for funding and technical assistance. As a member of CESA, Virginia Energy has regular opportunities to learn how similar programs in other states have structured the financing process. Virginia Energy and CESA are engaged in multiple projects to source seed funding and technical assistance to build out a proof of concept for how the LMI Solar Fund structure could work in Virginia.

In addition, Virginia Energy has approval to access approximately $500,000 of legacy American Reinvestment and Recovery Act ("ARRA" – federal stimulus dollars from 2009) funding in the form of revolving loan funds that have cycled back to Virginia Energy. Virginia Energy plans to use this ARRA funding as the initial funding source for the Pilot Program. Virginia Energy hopes that the success of the Pilot Program will serve as a "proof of concept" and will attract additional funding to the LMI Solar Fund for the Program.

For the Board and Virginia Energy to be successful in carrying out their mission and scaling up the LMI Solar Fund, the Board needs to adopt an expansive view of potential funding sources, including state budget appropriations, grants, gifts, donations, bequests, and other funds received on its behalf. The Board has confirmed that the LMI Solar Fund can accept funds from all of these sources.

Program Development Committee

Activities

Members of the Program Development Committee ("Program Committee" or "PDC") include KC Bleile of Viridiant, Taylor Brown of Sun Tribe Solar, Janaka Casper of Community Housing Partners ("CHP"), Toni Ostrowski of Virginia Housing, and Bill Greenleaf of Virginia Community Capital. Bill Greenleaf continues to serve as chair of the Program Committee.

In keeping with the COVID-19 State of Emergency, the Program Committee held a virtual public meeting on February 24, 2021. Minutes and recording is available on Virginia Town Hall, linked from the website for the Board (here). Additional research, analysis and outreach was conducted with individual Program Committee members working with Virginia Energy staff and other subject matter experts.

Outcomes

In 2021, the Program Committee, the Chair, and individual members of the Program Committee advised Virginia Energy on the development of a low-to-moderate income solar financing program. Program Committee members worked with CESA to conduct analysis and research to best understand the Virginia policy, regulatory, and financial environment to create a feasible program in accordance with the statutory requirements. Topics of discussion and research included:

- CESA technical assistance, scope and plan;
- State Treasury Fund setup and status;

- Power Purchase Agreements ("PPAs") in the Commonwealth; and
- Solar lease feasibility and market readiness.

From initial discussions within the Committee, staff of Virginia Energy, CESA advisors, PDC Committee Chair Greenleaf, Board Chair Coman, and Office of Attorney General representative Kronenberg together conducted a series of interviews with a variety of national solar lease companies to better understand their business model and perception of the Virginia market. These conversations informed further discussions and research in Virginia's regulatory environment, ultimately leading to the formation of the Policy and Regulatory Committee to continue research and activities in this area.

Related program developments

The Board, Program Committee members, and Virginia Energy staff continue to monitor Dominion's progress on developing a low-income solar program as required by Code § 56-596.2. Dominion will invest up to $25 million in a low-income solar program for customers in its service territory. Dominion refers to the solar program as Component 2, which will be rolled out after Component 1, which is focused on HVAC and other health and safety repairs. Dominion filed Component 2 solar program with the Commission in December 2020 and it was recently approved. Dominion plans to launch Component 2 in the first quarter of 2022.

Due to this large investment in low-income solar in Dominion's territory (and presumably forthcoming in APCo territory in the near future), the Board and Program Committee recommended focusing the Pilot Program in co-op and municipal utility territories instead of in Dominion and APCo's respective territories.

Stakeholder Engagement and Marketing Committee

Activities

Members of the Stakeholder Engagement and Marketing Committee ("Stakeholder Committee") include Hannah Coman of Apex Clean Energy, Susan Kruse of Community Climate Collaborative, Katherine Bond of Dominion Energy, and Kendyl Crawford of Virginia Interfaith Power and Light and the Council on Environmental Justice. Hannah Coman is the chair of the Stakeholder Committee.

In keeping with the COVID-19 State of Emergency, the Stakeholder Committee held virtual public

meetings once during 2021, on February 26. Minutes and recordings are available on Virginia Town Hall and linked to from the Board website, hosted by Virginia Energy.

Outcomes

The Stakeholder Committee worked closely with CESA and Virginia Energy to gather information to inform the draft RFP and continue its stakeholder engagement efforts from the previous year. Based on CESA's analysis and evaluation of locational variables, statutory considerations and program design elements, CESA recommended limiting the marketing aspect of the Pilot Program. This geographic focus for marketing does not limit the customer eligibility, but instead provides a focus that will be valuable in gathering data to improve marketing efforts in the future.

Through October and November of this year members of the Stakeholder Committee as well as other well-positioned members of the Board were asked to perform targeted stakeholder outreach to stakeholders in the following five localities as potential locations for a focused marketing campaign:

1. Wise County
2. Augusta County
3. City of Waynesboro
4. Shenandoah County
5. City of Franklin

Board members were asked to reach out to the following stakeholders: weatherization providers, solar providers, local government, community-based organizations, utilities, and any additional categories the Board member found appropriate.

Weatherization Providers

The Board received the following statistics from weatherization providers serving the five localities.

Total Single Family Households Served since 2016:

1. Augusta County - 133
2. Wise County - 44
3. Shenandoah County - 36
4. City of Waynesboro - 26
5. City of Franklin - 7 (served since 2019)

Current Single Family Households Wait List:

1. City of Franklin - 31 (estimate)
2. Wise County - 24
3. Augusta County - 7
4. City of Waynesboro - 2
5. Shenandoah County – 0

Since participation in weatherization services is a mandatory precursor for eligibility, the Stakeholder Committee found the data relating to weatherization in each of these communities especially informative.

Solar Installers

Outreach to solar installers included representatives from a local solar installation company who encouraged the Stakeholder Committee to consider vertical integration to support local solar installers, maintenance support, the number of roofing installs expected each year, schedule of delivery, and roofing materials of houses for purposes of the RFP.

Local Government

The Stakeholder Committee also received helpful feedback from local government. For example, the Director of Community Development for the City of Waynesboro said the local government in Waynesboro would be very supportive of the program, could help perform outreach to residents through a variety of means, and would be open to considering local solar incentives to support the Pilot Program.

Community-Based Organizations.

Members of the Stakeholder Committee also asked community-based organizations about the best ways to market the Pilot Program and engage with potential participants. Wise County Redevelopment and Housing Authority suggested that the best way to reach potential participants is via Facebook or TV ads. Blue Ridge Housing Network suggested engaging with first time homebuyers and requesting information to be included with utility bills. Habitat for Humanity Virginia suggested marketing with churches, flyers in laundry mats, with employers that have low to moderate income workers, at social service agencies and sending notices home to parents via students (i.e. “backpack express”). In addition, all three community-based organizations voiced support for the Pilot Program.

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Utilities

As part of the consultations with investor-owned utilities, the Board discussed marketing and outreach to low-income Virginians. In response to questions regarding a marketing plan for low-income solar customers, ODP stated that all of their available programs are detailed on the company website and the company does not do additional outreach or marketing apart from the website. ODP stated it would consider additional outreach if similar outreach is also performed by other investor-owned utilities of the same relative size. APCo also informed the Board that it does not have a solar marketing plan for low-income customers. Information regarding APCo's programs are available online for customers, but information is not included in the utility's mailings to customers. The Board encouraged ODP and APCo to meet with local and statewide organizations to help bridge the information gap between low-income customers and the utilities. Additional information on this topic is addressed in the "Investor Owned Utility Consultation" section.

The Stakeholder Committee is eager to continue its stakeholder engagement work in the next year. The Stakeholder Committee's current stakeholder engagement map is attached hereto as Appendix G. The Stakeholder Committee plans to reach out to residents in the selected localities in the Spring once the Board has more certainty on the structure of the Pilot Program.

Policy and Regulatory Committee

Activities

Members of the Policy and Regulatory Committee (in this subsection, the "Regulatory Committee" or "PRC") include KC Bleile of Viridiant, Sarah Nerette of RE Tech Advisors, Will Reisinger of ReisingerGooch, Will Cleveland of the Southern Environmental Law Center, and Sam Brumberg of the Virginia, Maryland and Delaware Association of Electric Cooperatives. Sam Brumberg is the Chair of the PRC.

The Regulatory Committee was established by the Board on July 21, 2021, and was broadly tasked with consideration of regulatory and policy questions and issues on behalf of the Board. The core of PRC's work in 2021 consisted of (i) evaluating funding opportunities to support the LMI Solar Fund, and (ii) opening discussions and dialogue on policy questions regarding the availability of solar leases in Virginia. In addition to those two core items, policy discussions were also held on potential amendments to the Board's governing statute, including the need for a proxy measurement to be

used for a required 12% energy efficiency reduction in Virginia Energy's low-income leasing program.

The Regulatory Committee held two in-person meetings in 2021, one on September 13, and one on November 9. As the Regulatory Committee was just established this year, time was dedicated to formalities, including the adoption of an electronic meeting policy and ensuring all committee members were up to speed on background information. Minutes and recordings are available on Virginia Town Hall and linked to from the Board website, hosted by Virginia Energy.

Outcomes

Followers of the Board's activities will recall that the Board's 2020 Annual Report mentioned the policy issue related to the legality/availability of solar leases for net metering. That issue has been under consideration by the Board almost since its inception, and one of the Board's initial discussions with CESA involved this particular issue. At the Regulatory Committee's September 13 meeting, various approaches were considered to get certainty on this issue. After much deliberation, the Regulatory Committee proposed that the most effective and efficient way to address this issue was to enter into a memorandum of understanding with the Commonwealth's three investor-owned utilities and twelve rate-regulated electric cooperatives, documenting their assent to the propositions (stated simply in layperson's terms) that (i) leases used in net energy metering are legal, and (ii) no certificate of public convenience and necessity ("CPCN") is needed for net energy metering activities under the Code of Virginia.[6] The Regulatory Committee reported on its plan to engage with the utilities at the Board's meeting on October 20. The Board had no questions for the Regulatory Committee and signaled its support for the approach. At the Regulatory Committee's meeting on November 9, the Regulatory Committee simplified its approach even further. It resolved to send letters of inquiry to the utilities on the propositions above and see if the utilities were in agreement with the Regulatory Committee's position on the two propositions, namely, that solar leases are, indeed, legal, and that no CPCN is required for net metering. This approach was supported unanimously by the members of the Regulatory Committee. Those letters will go out in 2021 and the Regulatory Committee will await responses to them in early 2022.

[6] A CPCN is a legal authorization from the State Corporation Commission ordinarily required to construct any electric generating facility. For renewable energy facilities and electric storage under 150 MW in size, an alternative is a permit-by-rule issued by the Department of Environmental Quality. However, for net metering facilities installed behind retail electric meters, pursuant to Va. Code §§ 56-594 and 56-594.01, such permits, to the knowledge of the Committee, have never been required.

Regarding the issue of the 12% energy efficiency reduction requirement, the Regulatory Committee recommends that the Board endorse a legislative change to the energy efficiency threshold in the form of a more effective measure.

Investor-Owned Utility Consultation

Section 4 of the VCEA states: "That each investor-owned utility shall consult with the Clean Energy Advisory Board established by Chapter 554 of the acts of Assembly of 2019 in how best to inform low-income customers of opportunities to lower electric bills through access to solar energy." This requirement from the VCEA provides the Board with a unique opportunity to engage with all of the investor-owned utilities. To this end, on November 3, 2021, the Board conducted consultations with all three investor-owned utilities in the Commonwealth to discuss how best to inform low-income households about solar energy programs that reduce energy bills.

The Board invited each investor-owned utility, Dominion, APCo and ODP, to present to the Board on each utility's current offerings and discuss solar energy programs for low-income households. The Board and IOUs agreed to an agenda for the consultation that included updates on energy efficiency and grid transformation, including the impact on and outreach to low-to-moderate income customers. Each IOU answered many questions from the Board on outreach, engagement and eligibility of low-to-moderate income customers in the Energy Share program and related programs. Details of the consultation including questions and answers may be found in the minutes of the November 3rd meeting at Virginia Town Hall, linked here as well as in the YouTube recording from the consultation.

The Board's consultation with all three IOUs was very productive and informative. The Board looks forward to engaging with Dominion, Old Dominion Power, and APCo on their future programs that enable low-income customers opportunities to lower electric bills through access to solar energy.

Key Outcomes in 2021

The following is an overview of the general activities of the Board and Virginia Energy relating to operations and activities of the Board:

- Expanded Board committee structure;
- Amended Bylaws and created a new electronic meeting policy;

- Completed Virginia-specific research on state agency programs (WAP, LIHEAP, etc.) and state regulatory framework/policies to inform the Board's work;
- Completed national research on similar LMI solar program design and best practices:
    - income verification options and cautions,
    - engagement with community-based organizations and LMI Communities,
    - financing options: solar leases; power purchase agreements; low-interest loans; grants; rebates; and shared solar ("community solar") subscriptions;
- Reviewed CESA Technical Assistance Report and recommendations;
- Participated in Virginia Shared Solar Low Income Stakeholder Workgroup facilitated by the State Corporation Commission and Virginia Energy via Chair Coman;
- Participated in the development of a RFP for the Pilot Program, with Chair Coman participating in advisory meetings with CESA and Virginia Energy staff;
- Analyzed the solar lease market nationally and in the Commonwealth and discussed with stakeholders the regulatory framework related to the solar lease structure;
- Sent letters of inquiry from the Policy and Regulatory Committee to the utilities to determine if the utilities are in agreement that (i) solar leases are legal, and (ii) no CPCN is required for net metering;
- Worked in collaboration with Virginia Energy to inform a Pilot Program that will utilize ARRA federal funding through the state energy office up to $500,000 for program implementation, marketing and administration;
- Conducted stakeholder outreach with local, community-based organizations, low income service providers, and other related entities to receive feedback on marketing for the Pilot Program; and
- Consulted with all three investor-owned utilities in the Commonwealth, including Dominion, APCo and ODP (Kentucky Utilities), as required in the VCEA.

Current Challenges and Barriers

The Board and Virginia Energy have identified the following specific challenges and barriers to launching the LMI Solar Fund:

- Lack of sustainable funding for the LMI Solar Fund to sufficiently scale up and meet the need;
- Tax incentives such as the Federal Investment Tax Credit (ITC) do not apply to low income households that do not have a tax burden so would need to be monetized in another way, such as through a solar developer (with potential for federal legislation to create "direct pay"

to offer this incentive to those who don't have a tax burden);

- Nascent market for residential Power Purchase Agreements for LMI customers in Virginia;
- LIHEAP funds are not able to be allocated to solar without a state requesting an exemption from the US Department of Energy and having such request granted (*e.g.*, Colorado);
- Eligibility for existing energy efficiency programs, such as the WAP, is limited to customers with a household income less than 60% of AMI, and as a result it is uncertain how to fund the required energy efficiency reduction for customers with a household income between 60-80% of AMI;
- On-site construction conditions on customer's homes may not be sufficient to withstand solar, *e.g.* roof structure, electric service; however, the DHCD has new funding from the regional carbon market auction proceeds from the RGGI, which is a key component to address deferred maintenance (*e.g.* roof structure), as well as reaching additional forms of housing stock (*e.g.* affordable and special needs housing);
- While auction proceeds from RGGI can support weatherization and energy efficiency measures, these funds are not authorized to be allocated to solar energy system investments;
- Lack of certainty regarding legality of solar leases in Virginia; and
- Two of the Board's seats are currently vacant, which results in a knowledge gap on the Board.

Next Steps and 2022 Goals

The Board is committed to launching a sustainable, scalable LMI Solar Fund to serve those who can benefit the most. Over the next year we plan to make substantial progress to achieving this goal. In the next year the Board aims to accomplish the following:

- Advise Virginia Energy on the release of the RFP and launch of the Pilot Program.
- Conduct annual consultations with the investor-owned utilities as required by the VCEA and follow up with documenting best practices and guidance for marketing solar and energy efficiency to LMI customers.
- Participate in Commission (and Virginia Energy) stakeholder engagement meetings, specifically the low-income stakeholder working group for the Shared Solar Program and multi-family shared solar.
- Consider all forms of fundraising, such as: state budget allocations, grants, private philanthropy, bequeaths or other permissible forms of funding to the LMI Solar Fund.

- Work to clarify that solar leases are a viable option in Virginia.
- Engage in direct stakeholder outreach to community-based organizations and LMI program beneficiaries and find new other ways to engage with beneficiary communities the LMI Solar Fund will serve.
- Ensure the Code reflects operable Program requirements, such as a reasonable, measurable energy efficiency prerequisite or a suitable proxy measurement that fulfills this function while granting a practical flexibility to Program administrators.

We hope 2022 will bring additional opportunities to continue and expand our work as it has become even more important.

Recommendations for the House, Senate and Governor's Office

Solar energy technology, paired with energy efficiency measures, is a proven solution to reduce energy expenses while supporting clean economy goals including investment in the local economy. The COVID-19 pandemic has exposed and amplified the inequities in our society, leaving an unprecedented number of utility customers with arrearages, and demonstrating the need to reduce high energy burdens. The Board's mission to ensure that low-to-moderate income Virginians are included in Virginia's energy transition is now more important than ever.

In order for the Board to be successful and accomplish the task set forth in the Board's enabling legislation, the Board will need the cooperation and support of the General Assembly and the Governor's Office. The Board respectfully makes the following recommendations:

- To ensure that the Board has all the expertise as envisioned for the membership, the Board recommends that the House, Senate and Governor finalize their appointments to the Board and act expeditiously when vacancies or term expirations occur.
- To ensure that the Board can accomplish its duties set forth in the Board's enabling legislation, the Board requests the General Assembly and Governor authorize a general fund appropriation to Virginia Energy to support the launch of the LMI Solar Fund.
- The Board requests the General Assembly and Governor address policy barriers to solar expansion, such as by expanding shared and multi-family shared solar to APCo territory and amending sections of the Code to ensure an operable LMI Solar Fund.

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Appendix A: Virginia Clean Energy Advisory Board Bylaws

ARTICLE I. APPLICABILITY

Section 1. General.

The provisions of these Bylaws are applicable to all proceedings of the Virginia Clean Energy Advisory Board (the Board) to the extent that the same are not inconsistent with the Code of Virginia or Executive Orders applicable to these proceedings. Whenever the provisions of these Bylaws are in conflict with the provisions of the Code of Virginia or an applicable Executive Order, the latter shall control.

Section 2. Board and Limitations.

The Board is constituted under § 45.1-395 of the Code of Virginia as an advisory board in the executive branch of the Commonwealth of Virginia. The Board is specifically charged with the duties and responsibilities set forth in Title 45.1, Chapter 27, of the Code of Virginia, primarily for the purpose of establishing, with the approval of the Director of the Virginia Department of Energy, a pilot program for disbursing loans or rebates for the installation of solar energy infrastructure in low-income and moderate-income households.

ARTICLE II. MEMBERS AND STAFF

Section 1. Appointment of Members; Terms; Vacancies.

All appointments shall be in accordance with § 45.1-396 of the Code of Virginia. Any ex officio members of the Board shall serve a term coincident with his or her term of office. Nonlegislative citizen members of the Board shall be appointed for a term of three years. Appointments to fill vacancies, other than by expiration of a term, shall be for the unexpired terms. Any appointment to fill a vacancy shall be made in the same manner as the original appointment. All members may be reappointed.

Section 2. Election of Chair and Vice-Chair.

The Board shall elect from its membership a Chair and Vice-Chair, both of whom shall serve in such capacities at the pleasure of the Board.

Vacancies in the position of Chair or Vice-Chair shall be filled for the remainder of the term by voice vote or roll call vote of the Board at the next meeting following the occurrence of the vacancy.

Section 3. Board Requests for Staff Assistance.

The Virginia Department of Energy staff shall serve as

staff to the Board.

Any Board member may request assistance from staff provided the request has been coordinated through the Chair or Vice-Chair of the Board.

ARTICLE III. MEETINGS

Section 1. Regular Meetings.

Meetings of the Board shall be held at the call of the Chair or whenever a majority of the members so request, at such time and place as the Board may determine. No business requiring a vote or final decision of the Board may be conducted in the absence of a quorum, as defined below.

Section 2. Annual Meetings.

The last regular meeting of the calendar year shall be designated as an annual meeting. Elections of officers shall be held at the Annual Meeting.

Section 3. Committee Meetings.

The Board may establish standing committees consisting of at least five members of the Board from time to time as needed to carry out the work of the Board.

Section 4. Compliance with FOIA.

All meetings of the Board or a Committee of the Board shall be noticed and conducted in conformance with The Virginia Freedom of Information Act, Title 2.2, Ch. 37 of the Code of Virginia.

Section 5. Quorum.

For any meeting of the Board, a majority of the members of the Board shall constitute a quorum. If a quorum has not been achieved, the meeting of the Board may proceed; provided, however, that voting on matters before the Board shall be postponed until a meeting of the Board at which a quorum is present.

Section 6. Conduct of Meetings.

The Chair of the Board shall conduct the meetings of the Board and shall rule on the interpretation and application of the Virginia Code and these by-laws.

The Vice-Chair of the Board shall preside over meetings of the Board in the absence of the Chair. In the event that neither the Chair nor the Vice-Chair of the Board shall be in attendance at a meeting where a quorum is nonetheless present, any member of the Board may call the meeting to order, and the members present shall elect a Chair *pro tempore* to preside over the meeting. Where a quorum is not present, a vote of the majority of those members present shall determine the Chair *pro tempore*.

All actions and decisions of the Board shall be made upon the motion of a member, duly seconded by another member and approved by a majority of the members who are present and voting.

The Chair shall put the question submitted to the Board for a voice vote and shall call for a vote only after determining that there are no more Board members who wish to speak or upon approval of a motion to close debate.

Any member who may not participate in the Board's consideration of a matter under the State and Local Government Conflict of Interests Act, § 2.2-3100 *et seq*. of the Code of Virginia, must comply with the disclosure requirements of the Act and not participate in the discussion or vote on the matter.

If it appears to the Chair, upon the voice vote being taken, that the members of the Board are divided on any question, the Chair shall determine the vote of the members by roll call. A tie vote on any matter defeats the motion or issue upon which the vote is taken. At the conclusion of the vote on the motion, the Chair shall announce whether the motion has been adopted or defeated.

Section 7. Agenda.

The proposed agenda for any meeting shall be determined by the Chair in consultation with staff. In addition, any members of the Board may suggest items to be included on the agenda.

The agenda for regular meetings of the Board will normally include the following: (1) review and approval of the last minutes of the Board; (2) a status report on the work plan and action items agreed to by the Board; and (3) other information of interest to the Board.

An opportunity shall be provided at each meeting of the Board for public comment. Any person who desires to speak will be asked to provide his or her name and the matter to be addressed prior to each meeting at which the public is able to comment.

Section 8. Amendments.

The bylaws of the Board may be amended at any regular meeting of the Board at which a quorum is present by a majority vote.

Section 9. Rules of Order.

Informal rules of order shall govern all matters of procedure unless objected to by any Board member. If such an objection occurs, then “Robert’s Rules of Order, Newly Revised” shall be the parliamentary authority for all matters of procedure not specifically covered by these bylaws.

Adopted by the Board on June 23, 2020.

Appendix B: Clean Energy Advisory Board Statute, Code of Virginia

Code of Virginia Title 45.2. Mines, Minerals and Energy. Chapter 19. Solar Energy. Article 3, Clean Energy Advisory Board.[7]

§ 45.2-1912. Definitions.

As used in this article, unless the context requires a different meaning:

"Board" means the Clean Energy Advisory Board created pursuant to § 45.2-1913.

"Fund" means the Low-to-Moderate Income Solar Loan and Rebate Fund created pursuant to § 45.2-1916.

"Program" means the Low-to-Moderate Income Solar Loan and Rebate Pilot Program created pursuant to § 45.2-1917.

2021, Sp. Sess. I, c. 387.

§ 45.2-1913. Clean Energy Advisory Board; purpose.

The Clean Energy Advisory Board (the Board) is established as an advisory board in the executive branch of state government. The purpose of the Board is to establish a pilot program for disbursing loans or rebates for the installation of solar energy infrastructure in low-income and moderate-income households.
2019, c. 554, § 45.1-395; 2021, Sp. Sess. I, c. 387.

§ 45.2-1914. Membership; terms; quorum; meetings.

The Board shall have a total membership of 17 members that shall consist of 16 nonlegislative citizen members and one ex officio member. Members may reside within or without the Commonwealth. Nonlegislative citizen members shall be appointed as follows:

1. Six nonlegislative citizen members to be appointed by the Speaker of the House of Delegates upon consideration of the recommendations of the Board of Directors of the Maryland-DC-Delaware-Virginia Solar Energy Industries Association (the MDV-SEIA Board) and the Governor's Advisory Council on Environmental Justice (the Council), one of whom shall be a designee of the Virginia Housing Development Authority, created pursuant to the provisions of Chapter 1.2 (§ 36-55.24 et seq.) of Title 36; one of whom shall be a rooftop solar energy professional or employer or representative of rooftop solar energy professionals; one of whom shall be a current

[7] https://law.justia.com/codes/virginia/2020/title-45-2/chapter-19/

or former member of the Council; one of whom shall be a member or representative of the Virginia, Maryland and Delaware Association of Electric Cooperatives (VMDAEC); one of whom shall be an expert with experience developing low-income or moderate-income incentive and loan programs for distributed renewable energy resources; and one of whom shall be an attorney who is licensed to practice in the Commonwealth and maintains a legal practice dedicated to rural development, rural electrification, and energy policy;

2. Three nonlegislative citizen members to be appointed by the Senate Committee on Rules upon consideration of the recommendations of the MDV-SEIA Board, one of whom shall be a solar energy professional or employer or representative of solar energy professionals, one of whom shall work for or with a Virginia-based investor-owned electric utility company, and one of whom shall be a member or representative of VMDAEC; and

3. Seven nonlegislative citizen members to be appointed by the Governor upon consideration of the recommendations of the MDV-SEIA Board and the Council and subject to confirmation by the General Assembly, one of whom shall be an attorney who is licensed to practice in the Commonwealth and maintains a legal practice in renewable energy law and transactions, one of whom shall be an attorney who is licensed to practice in the Commonwealth and specializes in tax law and energy transactions, one of whom shall be an attorney with the Division of Consumer Counsel created pursuant to the provisions of § 2.2-517, one of whom shall be an employee of a community development financial institution who specializes in impact investing, one of whom shall be a member of a Virginia environmental organization, and two of whom shall be designees of the Department of Housing and Community Development, created pursuant to the provisions of Chapter 8 (§ 36-131 et seq.) of Title 36.

The Director or his designee shall serve ex officio with voting privileges and shall assist in convening the meetings of the Board.

Nonlegislative citizen members of the Board shall be citizens of the Commonwealth. The ex officio member of the Board shall serve a term coincident with his term of office. Nonlegislative citizen members shall be appointed for a term of three years. Appointments to fill vacancies, other than by expiration of a term, shall be for the unexpired terms. Vacancies shall be filled in the same manner as the original appointments. All members may be reappointed.

The Board shall elect a chairman and vice-chairman from among its membership. A majority of the members shall constitute a quorum. The meetings of the Board shall be held at the call of the chairman or whenever the majority of the members so request.

2019, c. 554, § 45.1-396; 2020, c. 803; 2021, Sp. Sess. I, c. 387.

1. § 45.2-1915. Powers and duties of the Board; report. The Board shall have the following powers and duties:

2. To advise the Director on the management of the Low-to-Moderate Income Solar Loan and Rebate Fund (the Fund) pursuant to the provisions of § 45.2-1916;

3. To develop, establish, and operate, with the approval of the Director, a Low-to-Moderate Income Solar Loan and Rebate Pilot Program (the Program) pursuant to the provisions of § 45.2-1917;

4. To advise the Director on the possibility of working with a community development financial institution or other financial institutions to further the purposes of the Program;

5. To advise the Director on the distribution of moneys in the Fund in the form of loans or rebates pursuant to the provisions of § 45.2-1917; and

6. To submit to the Governor and the General Assembly an annual report for publication as a report document as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports. The chairman shall submit to the Governor and the General Assembly an annual executive summary of the interim activity and work of the Board no later than the first day of each regular session of the General Assembly. The executive summary shall be submitted for publication as a report document as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.

2019, c. 554, § 45.1-397; 2021, Sp. Sess. I, c. 387.

§ 45.2-1916. Low-to-Moderate Income Solar Loan and Rebate Fund.

There is hereby created in the state treasury a special nonreverting fund to be known as the Low-to-Moderate Income Solar Loan and Rebate Fund (the Fund). The Fund shall be established on the books of the Comptroller. All funds appropriated for such purpose and any gifts, donations, grants, bequests, and other funds received on its behalf shall be paid into the state treasury and credited to the Fund. Interest earned on moneys in the Fund shall remain in the Fund and be credited to it. Any moneys remaining in the Fund, including interest thereon, at the end of each fiscal year shall not revert to the general fund but shall remain in the Fund.

Moneys in the Fund shall be used solely for the purposes of extending loans or paying rebates to electric customers who complete solar installations or energy efficiency improvements pursuant to the provisions of § 45.2-1917. Expenditures and disbursements from the Fund shall be made by the State Treasurer on warrants issued by the Comptroller upon written request signed by the Director.

2019, c. 554, § 45.1-398; 2021, Sp. Sess. I, c. 387.§ 45.2-1917.

Low-to-Moderate Income Solar Loan and Rebate Pilot Program.

A. The Board, with the approval of the Director, shall develop and establish a Low-to-Moderate Income Solar Loan and Rebate Pilot Program (the Program) and rules for the loan or rebate application process. The Program shall be open to any Virginia resident whose household income is at or below 80 percent of the state median income or regional median income, whichever is greater. The Program shall allow only one loan per residence, irrespective of the ownership of the solar energy system that is installed. Such loan shall be available only for a solar installation or energy efficiency improvements pursuant to the provisions of Chapter 1.2 (§ 36-55.24 et seq.) of Title 36.

B. The Board shall accept an application only from the installer of the solar installation or the agent of the customer.

Each application shall include (i) 12 months of the customer's utility bills prior to installation of the solar energy system and an agreement to provide 12 months of utility bills to the Board following the installation; (ii) the customer's permission for the Director to (a) create a customer profile for the customer if he becomes an eligible loan or rebate customer, (b) aggregate the data provided by such eligible loan or rebate customers, and (c) use such aggregate data for the purpose of lowering energy costs and implementing effective programs; (iii) evidence of the completion of a home performance audit, conducted by a qualified local weatherization service provider, before and after installation of energy efficiency services such as lighting or insulation improvements, attic tents, weatherization, air sealing of openings in the building envelope, sealing of ducts, or thermostat upgrades, to demonstrate that such energy efficiency services were completed and resulted in a reduction in consumption of at least 12 percent; and (iv) an affidavit attesting to the receipt of a public benefit at the time the solar energy system is to be installed.

C. The Board shall review each application submitted to it on a first-come, first-served basis and shall recommend to the Director the approval or denial of each such application within 30 days of receipt. If the Director approves an application, he shall hold a reservation of funds for as long as 180 days for final loan or rebate claim and disbursement.

D. A customer whose application is approved may install an energy system that is interconnected pursuant to the provisions of § 56-594 or any section in Title 56 that addresses net energy metering provisions for electric cooperative service territories.

E. All of the work of installing the energy system shall be completed by a licensed contractor that (i) possesses an Alternative Energy System (AES) Contracting specialty as defined by the Board for Contractors pursuant to the provisions of Chapter 11 (§ 54.1-1100 et seq.) of Title 54.1; (ii) possesses certification for solar installation from the North American Board of Certified Energy Practitioners, Solar Energy International, Roof Integrated Solar Energy, or a similar installer certification program; (iii) possesses a rating of "A" or higher from the local Better Business Bureau; and (iv) has installed a minimum of 150 net-metered residential solar systems in Virginia. If the work of installing the solar energy system requires electrical work, it shall be completed by an electrical contractor licensed by the Virginia Department of Professional and Occupational Regulation. All photovoltaic panels, inverters, and other electrical apparatus used in the solar energy system shall be tested and certified by a federal Occupational Safety and Committee Chairs Health Administration Nationally Recognized Testing Laboratory such as UL LLC and installed in compliance with manufacturer specifications and all applicable building and electrical codes.

F. The customer or the installer, acting on behalf of the customer, shall submit any loan or rebate claim within 90 days of completion of the installation of the solar energy system, with completion deemed to have occurred once the solar energy system's bi-directional meter or net meter, or the respective utility's revenue grade meter, has been installed and the system has been electrified. Each rebate claim shall include, at a minimum, a date of system electrification and a time-stamped and date-stamped verification of (i) bi-directional net meter delivery or (ii) the operation of a compatible programmed smart meter capable of tracking net metering activity.

G. The Director shall review and approve or deny a loan or rebate claim within 60 days of receipt and shall provide a written explanation of each denial to the respective claimant. The Director shall disburse from the Low-to-Moderate Income Solar Loan and Rebate Fund created pursuant to § 45.1-398 the loan or rebate for each approved claim within 60 days of its receipt of the claim and according to the order in which its respective application was approved. Any rebate or grant shall be in the amount of no more than $2 per DC watt for up to six kilowatts of solar capacity installed. The customer may use a rebate in addition to any federal tax credits or state incentives or enhancements earned for the same solar installation.

2019, c. 554, § 45.1-399; 2021, Sp. Sess. I, c. 387.

Appendix C: Clean Energy Advisory Board Members, as of 12-15-2021

First Name	Last Name	Affiliation	Title	Appointment	Term Expires
Katharine	Bond	Dominion Energy	Vice President, Public Policy and State Affairs	Senate Committee on Rules	6/30/22
Kirk	Johnson	Old Dominion Electric Cooperative (ODEC)	Senior Vice President, Member Engagement	Senate Committee on Rules	6/30/22
Taylor	Brown	Sun Tribe Solar	Chief Technical Office	Senate Committee on Rules	6/30/23
Toni	Ostrowski	Virginia Housing Development Authority	Managing Director of Homeownership	Speaker of the House	6/30/22
Kendyl	Crawford	Virginia Interfaith Power & Light; Virginia Council on Environmental Justice	Co-Director	Speaker of the House	6/30/24
Sam	Brumberg	Virginia, Maryland & Delaware Association of Electric Cooperatives (VMDAEC)	Vice President of Regulatory Affairs & Counsel	Speaker of the House	6/30/24
Sarah	Nerette	RE Tech Advisors	Senior Consultant	Speaker of the House	6/30/24
Carmen	Bingham	Virginia Poverty Law Center	Affordable Energy Project Coordinator	Speaker of the House	12/14/24
Will	Cleveland	Southern Environmental Law Center	Senior Attorney	Speaker of the House	6/30/24

First Name	Last Name	Affiliation	Title	Appointment	Term Expires
KC	Bleile	Viridiant **Designee of the Department of Housing and Community Development*	Executive Director	Governor	6/30/22
Vacant		*Office of the Attorney General, Division of Consumer Counsel*		*Governor's Office*	--
Janaka	Casper	Community Housing Partners **Designee of the Department of Housing and Community Development*	Chief Executive Officer	Governor's Office	6/30/22
William	Greenleaf* **Vice Chair*	Virginia Community Capital **Employee of a Community Development Financial Institution, Impact Investing*	Clean Energy Loan Officer	Governor's Office	6/30/22
Hannah	Coman* **Chair*	Apex Clean Energy	Associate General Counsel	Governor's Office	6/30/22
William	Reisinger	ReisingerGooch, PLC **Licensed Attorney, Renewable Energy Law and Transactions*	Attorney	Governor's Office	6/30/22

First Name	Last Name	Affiliation	Title	Appointment	Term Expires
Susan	Kruse	The Community Climate Collaborative (C3)	Executive Director	Governor's Office	6/30/22
John	Warren	Virginia Department of Energy (Virginia Energy)	Director	*Ex-officio with voting privileges*	*n/a*

Appendix D: U.S. DOE LEAD Analysis by Virginia Census Tract (excerpt)

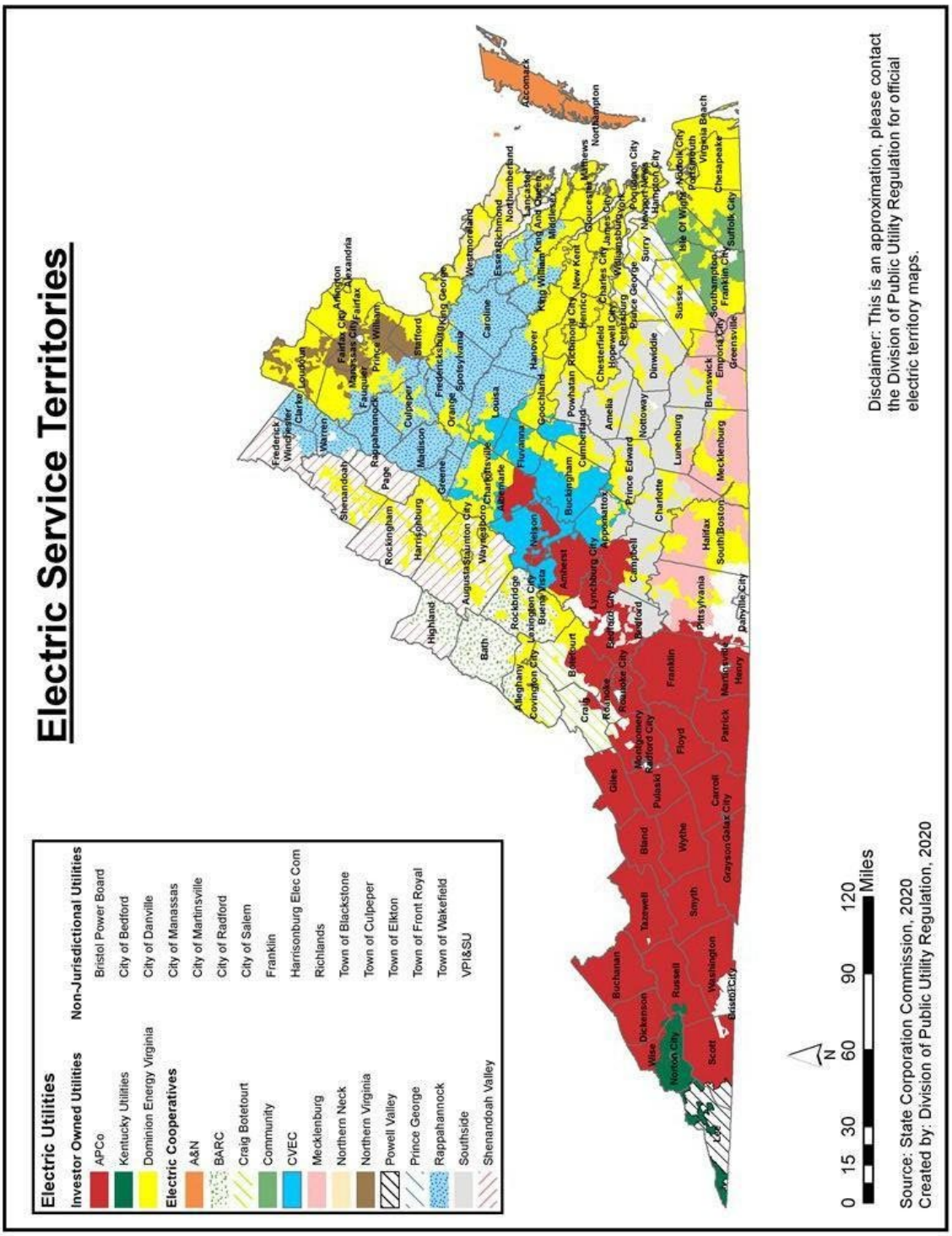
Low-Income Energy Affordability Data Tool Map Export (https://www.energy.gov/eere/slsc/maps/lead-tool)

Compiled by:	Carrie Hearne, Virginia Department of Mines, Minerals and Energy
Exported On:	9/11/2020
AMI:	0% - 30%; 30% - 60%; 60% - 80%
Building Age:	Before 1940; 1940 - 59; 1960 - 79; 1980 - 99; 2000 - 09; 2010+
Heating Fuel Type:	Electricity
Building Type:	1 unit detached
Rent/Own:	Owner-occupied

	Geography ID	County	Name	Avg. Energy Burden (% income)	Avg. Annual Energy Cost	Housing Counts
1	51003010903	Albemarle County	Census Tract 109.03	51	$ 950	17
2	51590000600	Danville city	Census Tract 6	27	$ 5,298	20
3	51760040400	Richmond city	Census Tract 404	27	$ 2,497	8
4	51590000300	Danville city	Census Tract 3	24	$ 5,137	105
5	51590000400	Danville city	Census Tract 4	24	$ 5,109	89
6	51001090100	Accomack County	Census Tract 901	24	$ 4,847	127
7	51590001000	Danville city	Census Tract 10	21	$ 5,553	92
8	51590000200	Danville city	Census Tract 2	21	$ 5,401	89
9	51590001100	Danville city	Census Tract 11	21	$ 4,902	31
10	51590000700	Danville city	Census Tract 7	21	$ 4,776	69
11	51590001200	Danville city	Census Tract 12	21	$ 4,553	48
12	51590000800	Danville city	Census Tract 8	21	$ 4,539	97
13	51119951200	Middlesex County	Census Tract 9512	21	$ 4,218	212
14	51830370200	Williamsburg city	Census Tract 3702	21	$ 2,138	14
15	51143011200	Pittsylvania County	Census Tract 112	20	$ 4,171	93
16	51590000900	Danville city	Census Tract 9	19	$ 4,908	170
17	51117930102	Mecklenburg County	Census Tract 9301.02	19	$ 4,677	79
18	51013101702	Arlington County	Census Tract 1017.02	18	$ 6,616	1
19	51590000100	Danville city	Census Tract 1	18	$ 4,663	129
20	51171040201	Shenandoah County	Census Tract 402.01	18	$ 4,646	45
21	51590000500	Danville city	Census Tract 5	18	$ 4,495	16
22	51117930700	Mecklenburg County	Census Tract 9307	18	$ 3,782	69
23	51117930500	Mecklenburg County	Census Tract 9305	18	$ 3,118	75
24	51163930200	Rockbridge County	Census Tract 9302	18	$ 3,081	245
25	51710004900	Norfolk city	Census Tract 49	18	$ 2,061	4
26	51810045412	Virginia Beach city	Census Tract 454.12	17	$ 5,020	76
27	51067020101	Franklin County	Census Tract 201.01	17	$ 3,356	298
28	51111930300	Lunenburg County	Census Tract 9303	17	$ 3,061	24
29	51059482100	Fairfax County	Census Tract 4821	17	$ 2,565	8
30	51067020102	Franklin County	Census Tract 201.02	16	$ 3,734	93
31	51133020200	Northumberland County	Census Tract 202	16	$ 3,705	204
32	51083930100	Halifax County	Census Tract 9301	16	$ 2,962	89
33	51660000207	Harrisonburg city	Census Tract 2.07	16	$ 2,409	17
34	51700032127	Newport News city	Census Tract 321.27	16	$ 2,227	14
35	51193010100	Westmoreland County	Census Tract 101	15	$ 3,896	301
36	51019030503	Bedford County	Census Tract 305.03	15	$ 3,752	150
37	51133020100	Northumberland County	Census Tract 201	15	$ 3,489	248
38	51057950800	Essex County	Census Tract 9508	15	$ 3,310	104
39	51740210900	Portsmouth city	Census Tract 2109	15	$ 3,262	8
40	51117930600	Mecklenburg County	Census Tract 9306	15	$ 3,137	75
41	51169030300	Scott County	Census Tract 303	15	$ 2,961	143
42	51117930800	Mecklenburg County	Census Tract 9308	15	$ 2,911	158
43	51135000200	Nottoway County	Census Tract 2	15	$ 2,903	106
44	51029930202	Buckingham County	Census Tract 9302.02	15	$ 2,902	137
45	51595890200	Emporia city	Census Tract 8902	15	$ 2,414	59
46	51133020300	Northumberland County	Census Tract 203	14	$ 3,616	352
47	51001090200	Accomack County	Census Tract 902	14	$ 3,469	172
48	51119950900	Middlesex County	Census Tract 9509	14	$ 3,244	77
49	51131930300	Northampton County	Census Tract 9303	14	$ 3,097	160
50	51119951100	Middlesex County	Census Tract 9511	14	$ 3,021	249

Full analysis available via US Department of Energy, Low-income Energy Affordability Data ("LEAD") Tool

Appendix E: Virginia Electric Service Territories, courtesy of the Commission



Appendix F: Market Research for Developing a LMI Solar Pilot Program in Virginia

Market Research for Developing an LMI Solar Pilot Program in Virginia

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CESA Role

In early 2021, Clean Energy States Alliance (CESA), a coalition of state energy organizations working together to advance clean energy and bring the benefits of clean energy to all, received an anonymous grant to help Virginia develop a solar pilot program for low- and moderate-income (LMI) homes. Under the grant, CESA has been funded to work with the Virginia Department of Mines, Minerals and Energy (DMME) and the Clean Energy Advisory Board (CEAB) over the course of 12 months to support the design and implementation of a solar pilot program for LMI homeowners. In collaboration with DDME and the CEAB, CESA will work to advance a pilot program that reaches its intended audience, provides maximum impact without excessive administrative burdens, meets program benchmarks, and delivers meaningful benefits to participating LMI households.

Under the grant, CESA is prepared to provide assistance to DMME and the CEAB in several areas, including:

1. LMI Solar Program Design: CESA will prepare a written pilot program design and implementation plan.
2. Stakeholder Engagement and Program Refinement: CESA will help find meaningful ways to engage underserved communities and community-based organizations in the program design process.
3. Preparation of a Program Solicitation: CESA is prepared to help draft an RFP for DMME to issue to attract solar providers to participate in the program.
4. Advising on Program Implementation and Marketing: CESA is prepared to provide advice to DMME to ensure that the pilot program reaches its intended audience.
5. Production of Educational and Promotional Materials: CESA is prepared to help develop and design accessible materials and program information.

CESA's primary aim for its engagement with DMME and the CEAB is to help get a successful solar pilot for LMI homeowners up and running. After 12 months, CESA will continue to assist DMME on the operation of its program through DMME's membership in CESA, but to a much lesser degree.

As a starting point for the development of a LMI solar pilot program, CESA began focused, market research on Virginia's solar policy and regulatory landscape, residential solar project economics, income and energy burden demographics, and barriers and opportunities for launching solar program for LMI homeowners in the Commonwealth. This is the basis for this report. CESA research is intended to build off, not to supplant, prior research completed by DMME and the CEAB in these areas. We plan to use this research to inform an LMI solar program design proposal for the Commonwealth.

Virginia's Residential Solar Policy Solar Landscape

Virginia ranks 11th among US states in overall solar installed capacity. The number of residential solar installations has grown sharply in the last few years, driven by a range of solar friendly policy developments. Some policy developments have helped expand the solar market in the Commonwealth while others hold particular promise for enabling low- and moderate-income (LMI) Virginians to access solar energy.

Renewable Energy Targets

In 2007, the Virginia General Assembly passed legislation establishing a framework for a voluntary Renewable Portfolio Standard (RPS) program for the Commonwealth. Recently, the state's RPS targets have increased in ambition and enforceability. In 2018, the Virginia Grid Transformation and Security Act (SB 966) deemed 5,500 megawatts of solar and wind resources to be in Virginia's public interest. Then, in September 2019, Governor Ralph Northam issued an executive order (EO 43) calling for the development of an action plan to produce 100 percent of Virginia's electricity from carbon-free sources by 2050. In 2020, the Virginia General Assembly codified Governor Northam's goal, requiring the Commonwealth's two major investor-owned utilities to become carbon free by 2050 at the latest.

Virginia Clean Economy Act

In addition to establishing zero-carbon emissions goals for the Commonwealth's major utilities, the 2020 Virginia Clean Economy Act (SB 851/HB1526) requires Dominion Energy to procure at least one percent of its annual electricity for Renewable Portfolio Standard compliance from distributed generation facilities. It also requires that at least one quarter of such distributed generation be obtained from low-income qualifying projects. The law defines a low-income qualifying project as "a project that provides a minimum of 50 percent of the respective electric output to low-income utility customers." The State Corporation Commission is assessing Dominion Energy's proposal to comply with its Renewable Portfolio Standard obligations, including the utility's low-income obligations, in a pending case (SCC Case No. PUR-2020-00134).

The Virginia Clean Economy Act allows the use of power purchase agreements (PPAs) for solar projects sized between 50 kW and 3 MW through pilot programs conducted by Dominion Energy, Appalachian Power, and Old Dominion Power. LMI customers and tax-exempt organizations are exempted from the 50-kw size minimum for PPAs for solar projects, effectively making them eligible for small-scale solar PPAs under these pilot programs.

The Virginia Clean Economy Act directed the Commonwealth to join the Regional Greenhouse Initiative (RGGI), a voluntary, market-based, cap-and-invest program that has been joined by other Northeast and mid-Atlantic states. RGGI imposes limits on greenhouse gas emissions from electric plants, which has created a market for emissions allowances. Through an auction process, these RGGI allowances generate proceeds. The Virginia Department Virginia Department of Housing and Community Development (DHCD) Housing Innovations in Energy Efficiency Program is funded through RGGI proceeds. HIEE will make energy efficiency upgrades to new and existing residence to reduce energy bills for low-income Virginians. DHCD has embarked on a stakeholder process for HIEE program development. Currently, solar PV is not an eligible technology under this program, but roof repairs, which can help enable rooftop solar adoption for homeowners, is.

Virginia Solar Freedom Act (HB 572)

In 2020, the Virginia General Assembly enacted the Virginia Solar Freedom Act (HB 572). It established a program for Dominion and Old Dominion Power customers living in multifamily housing to offset their electricity usage through a subscription to a solar facility. The legislation also increased the state's cap on net energy metering from 1% to 6% of each Virginia utility's

peak load and set aside one percent of the available net energy metering capacity for low-income customers. The State Corporation Commission has proposed regulations to implement the amended net metering cap under the Act (SCC Case No. PUR-2020-00195).

Shared Solar Legislation (SB 629)

In 2020, the Virginia General Assembly passed SB 629, which ordered the State Corporation Commission to establish a shared solar program for Dominion Energy customers in Virginia. The statute allows Dominion Energy customers to subscribe to a shared solar facility for the amount of electricity generated by it.

In December 2020, the State Corporation Commission issued shared solar program rules (SCC Case No. PUR-2020-00125). Under the rules, the maximum size of the shared solar program must not exceed 150 megawatts, at least 30% of which must be apportioned to low-income customers. Each entity operating or owning a shared solar facility must demonstrate that it meets the low-income customer requirement. After the program's 30% low-income requirement is satisfied, the program will be expanded to a cumulative total of 200 megawatts. Generally, Dominion Energy customers will be subject to a minimum bill requirement to subscribe to a shared solar facility, but low-income customers are exempt from this provision. Dominion Energy is to begin accepting applications for registration by July 1, 2021.

Enabling Statute for the Virginia Clean Energy Advisory Board

In 2019, Virginia General Assembly passed HB 2741, which created the CEAB and directed it to work with the DMME to "establish a pilot program for disbursing loans or rebates for the installation of solar energy infrastructure in low-income and moderate-income households" (HB 2741). Through this legislation, the Virginia General Assembly designated a special non-reverting fund in the state treasury for LMI solar program financing. The CEAB was convened in 2020 and is working to advance an LMI solar pilot program in the Commonwealth. In 2020, the General Assembly passed HB 1707, which repealed a 2022 sunset provision for the CEAB, and added additional Board members to its composition.

Law Authorizing On-Bill Financing Programs for Coops

During the 2020 legislative session, Governor Northam signed SB 754 into law. The statute allows electric cooperatives in Virginia to create an on-bill tariff program on or after January 1, 2021. On-bill financing programs enable electric cooperative customers to pay the costs of energy efficiency and clean energy upgrades over time through a line-item charge on their monthly electric bills. This on-bill line-item charge is assigned to the electric meter rather than to a customer personally. Virginia's law allows electric cooperatives to create programs without State Corporation Commission approval, but program development requires a stakeholder process that "include[s] an opportunity to participate for low-income and middle-income advocates, energy efficiency advocates, affordable housing advocates, and the staff of the [State Corporation] Commission."

Funding for a Solar Pilot Program for LMI Homeowners

DMME has received approval to re-purpose approximately $200,000 in federal American Recovery and Reinvestment Act (ARRA) funds to support an LMI solar pilot program. This

funding is being placed in Virginia's statutorily created Low-to-Moderate Income Solar Loan and Rebate Fund. It represents the entire corpus of Virginia's Low-to-Moderate Income Solar Loan and Rebate Fund and is the only dedicated, direct, public program funding available for an LMI solar pilot under HB 2741 to date.

In future years, DMME staff may petition for a program funding allocation from Virginia's General Funds as part of the state's annual budget process. (DMME has requested funding through these channels to support an LMI solar pilot before, but with other pressing budgetary spending priorities, these have been denied.) A successful pilot program might help demonstrate the case for long-term program investment and expansion by the Virginia General Assembly. DMME and the CEAB have also explored the possibility of leveraging private investment to support solar for LMI residents with organizations such as the Coalition for Green Capital and the Climate Access Fund. Through CESA's US Department of Energy-supported *Scaling Up Solar for Under-Resourced Communities* project, Virginia may apply to for up to $50,000 to support the launch of a solar program for LMI homeowners.

Residential Solar System Cost Analysis

We conducted a residential solar installation financial analysis for Virginia under different financing parameters to get an indication of the costs of a typical rooftop system and to help identify the level of subsidy necessary for cash-flow positive solar transactions for LMI Virginians. The methodology we used was developed by the North Carolina Clean Energy Technology Center, and they calculated the results.

Methodology and Assumptions

We costed out a typical residential solar system in three Virginia locations—Accomack County, Roanoke, and Virginia Beach—served by three different utilities—A&N Cooperative, Appalachian Power, Dominion Energy, respectively. We examined three different scenarios for financing such a system in these locations without any new special incentives for LMI solar. The three scenarios involved 15-year market-rate loans at 4.74 percent, described below:

1. A homeowner who takes out a loan and then claims the federal investment tax credit and any applicable state credit at the end of the year.
2. A homeowner who takes out a smaller loan that does not include the value of the tax credits. For example, the homeowner has savings or another way to pay for part of the system upfront and then receives the tax credits at the end of the year.
3. A homeowner who is unable to take advantage of the federal tax credit or any applicable state tax credit.

To begin to understand the level of special state incentives that might be needed for cash-flow positive solar transactions for LMI homeowners, we modeled two alternative possible special incentives for each of the loan scenarios:

1) A buy-down of the interest rate from 4.74 percent to 2 percent. If this interest rate-buy-down was subsidized by state, it would cost Virginia between $1,800 to $4,000 per installation.

2) An upfront cash payment that reduces the system cost by $5,000.

For the Virginia Beach (Dominion Energy), we also looked at the amount required for an upfront cash payment to enable a cash-flow positive transaction in Year 1.

Because residential solar leases are not currently being offered in the Virginia marketplace, there is no existing data for lease prices for Virginia. However, the numbers for loan products with monetization of the federal tax credit gives a rough sense of the economics of a residential solar system under a lease model. We also modeled a solar lease based on the structure used in some other states. This is not to say that solar companies in Virginia would offer leases with these terms, but it provides an estimate of what a residential solar lease could look like in the Commonwealth.

We modeled a 6.4-kilowatt system because that was the median size for all residential systems installed in the US in 2018, according to Lawrence Berkeley National Laboratory's *Tracking the Sun* report, and is coincidentally also the median size for the systems installed on LMI single-family homes through the Connecticut Green Bank's Solar for All Program. We assumed an annual electricity price escalation rate of 2.5% and an annual degradation rate of 0.5% and a discount rate of 0%. We modeled a typical solar loan term—in this case, a 15-year loan with no payments due in years 16-25. We assumed a monetizable federal investment tax credit of 26% would be monetizable. (Currently, the investment tax credit for solar installations is set at 26% and is scheduled to step down to 22% in 2023. Thereafter, no investment tax credit is available for resident-owned solar installations.) Our analysis assumed a per kilowatt system cost of $3.05 for a 6.4-kW installation. Different rate tariffs—fixed bill charges and energy rates—as well as sale tax and property tax rates, apply depending upon the system location modeled.

Results

Accomack 6.4-kW Installation

Scenario	Monthly Loan Payment	Net Monthly Savings		Payback Period
Market Rate Loan (4.74%) without Special State Incentives				
Loan for homeowner who qualities for federal tax credit	$158.22	Year One	($83.84)	22 Years
		25-Year Average	$20.11	
Loan with federal tax credit received and excluded from upfront cost	$116.20	Year One	($41.82)	20 Years
		25-Year Average	$27.93	
Loan with no federal or state tax credit	$158.22	Year One	($83.84)	25 Years
		25-Year Average	$2.92	
State Incentive: 2% Interest Rate				
Loan for homeowner who qualities for federal tax credit	$130.09	Year One	($55.71)	18 Years
		25-Year Average	$36.99	

Loan with federal tax credit received and excluded from upfront cost	$95.54	Year One	($11.16)	17 Years
		25-Year Average	$40.33	
Loan with no federal or state tax credit	$130.09	Year One	($55.71)	22 Years
		25-Year Average	$19.60	
State Incentive: $5,000 Rebate				
Loan for homeowner who qualities for federal tax credit	$118.78	Year One	($44.40)	17 Years
		25-Year Average	$43.77	
Loan with federal tax credit received and excluded from upfront cost	$76.76	Year One	($2.38)	15 Years
		25-Year Average	$51.60	
Loan with no federal or state tax credit	$118.78	Year One	($44.40)	20 Years
		25-Year Average	$26.39	

Roanoke 6.4-kW Installation

Scenario	Monthly Loan Payment	Net Monthly Savings		Payback Period
Market Rate Loan (4.74%) without Special State Incentives				
Loan for homeowner who qualities for federal tax credit	$158.22	Year One	($88.56)	>25 Years
		25-Year Average	($2.37)	
Loan with federal tax credit received and excluded from upfront cost	$116.20	Year One	($46.54)	24 Years
		25-Year Average	$5.46	
Loan with no federal or state tax credit	$158.22	Year One	($88.56)	>25 Years
		25-Year Average	($19.75)	
State Incentive: 2% Interest Rate				
Loan for homeowner who qualities for federal tax credit	$130.09	Year One	($60.43)	22 Years
		25-Year Average	$14.51	
Loan with federal tax credit received and excluded from upfront cost	$95.54	Year One	($25.88)	21 Years
		25-Year Average	$17.86	
Loan with no federal or state tax credit	$130.09	Year One	($60.43)	>25 Years
		25-Year Average	($2.87)	
State Incentive: $5,000 Rebate				
Loan for homeowner who qualities for federal tax credit	$118.78	Year One	($49.12)	20 Years
		25-Year Average	$21.29	
Loan with federal tax credit received and excluded from upfront cost	$76.76	Year One	($7.10)	18 Years
		25-Year Average	$29.12	

Loan with no federal or state tax credit	$118.78	Year One	($49.12)	24 Years
		25-Year Average	$3.91	

Virginia Beach 6.4-kW Installation

Scenario	Monthly Loan Payment	Net Monthly Savings		Payback Period
Market Rate Loan (4.74%) without Special State Incentives				
Loan for homeowner who qualities for federal tax credit	$158.78	Year One	($89.62)	23 Years
		25-Year Average	$14.60	
Loan with federal tax credit received and excluded from upfront cost	$116.09	Year One	($59.22)	21 Years
		25-Year Average	$22.76	
Loan with no federal or state tax credit	$158.78	Year One	($89.62)	>25 Years
		25-Year Average	($2.85)	
State Incentive: 2% Interest Rate				
Loan for homeowner who qualities for federal tax credit	$130.55	Year One	($61.39)	19 Years
		25-Year Average	$31.54	
Loan with federal tax credit received and excluded from upfront cost	$95.45	Year One	($36.47)	19 Years
		25-Year Average	$35.15	
Loan with no federal or state tax credit	$130.55	Year One	($61.39)	23 Years
		25-Year Average	$14.09	
State Incentive: $5,000 Rebate				
Loan for homeowner who qualities for federal tax credit	$119.34	Year One	($50.18)	18 Years
		25-Year Average	$32.55	
Loan with federal tax credit received and excluded from upfront cost	$76.65	Year One	($7.49)	16 Years
		25-Year Average	$46.43	
Loan with no federal or state tax credit	$119.34	Year One	($50.18)	22 Years
		25-Year Average	$20.81	
State Incentive: $12,000 Rebate				
Loan for homeowner who qualities for federal tax credit	$64.12	Year One	$5.04	11 Years
		25-Year Average	$71.39	
State Incentive: $6,500 Rebate				
Loan with federal tax credit received and excluded from upfront cost	$64.82	Year One	$4.35	15 Years
		25-Year Average	$53.52	

Findings and Conclusions

A number of key findings emerged from this analysis:

1. The overall costs for typical residential installation did not yield dramatically different results between the three Virginia locations we modeled.

2. None of the basic loan financing scenarios in any of the modeled locations yielded a positive cash flow in Year One. Initial negative cash flow from taking out a loan to finance a solar system is a large hurdle for LMI customers in Virginia.

3. Being able to take advantage of the federal investment tax credit makes a significant difference in Year One monthly loan costs. If a customer is able to deduct the value of the federal tax credit from the upfront cost of the system, Year One loan costs are roughly half of what they would otherwise be under a "no federal or state tax credit" scenario.

4. Neither a buy-down of the interest rate of the loan to 2 percent, nor adding an upfront cash payment to reduce the system cost by $5,000 was sufficient by itself to generate a cash-flow positive solar loan transaction. A significant incentive—greater than an interest rate buydown to 2 percent or a $5,000 rebate—is necessary for a customer to have a cash-flow positive solar loan transaction from Year One through the life of the system.

5. The hypothetical lease structure we modeled, which would enable monetization of the federal tax credit, could provide first-year savings of around $16 to $20. No solar leases are being offered in Virginia and the lease terms we modeled are theoretical, but it suggests cash-flow positive leases could be achieved in Virginia, especially with an additional solar rebate folded in.

6. Under our model, the rebate necessary to achieve a first-year savings of about $4 to $5 for a 6.4-kw system in Virginia Beach is $6,500, assuming that federal tax credit can monetized and is used to offset the upfront system cost. If the federal tax credit is not monetized and deducted from the system cost, a $12,000 rebate would be necessary to achieve nominal savings in Year One.

Based on this analysis, we reached the following conclusions:

1. A 25-year lease offers a preferable financing product for LMI homeowners compared to a loan:
    - A 25-year lease spreads out the financing over a longer period than a typical 15-year loan. That makes it easier to ensure immediate savings in Year One, even if the average annual savings over 25 years may be less.
    - Because the leasing company, rather than the homeowner, owns the solar system, it can take advantage of a federal tax credit even if the customer cannot. Low-income customers often do not have sufficient tax liability to take advantage of the federal tax credit.
    - Low-income customers may not be able to qualify for market rate loans due to insufficient income, credit score, or debt-to-income ratios. LMI customers may

also be reluctant to take on additional debt. Solar leases offer an alternative. Some solar lease companies offer alterative underwriting criteria.

- A solar lease offers LMI customers fixed monthly expense predictability. Leases may also avoid the need for LMI customers to carefully manage their solar systems since insurance, maintenance, repairs, and inverter replacement are often included as part of a solar lease package.

2. Since we did not have access to real-world lease data from Virginia, to better understand the market conditions necessary to create a cash-flow positive solar lease transaction, we looked at California, where we had access to real-world loan and solar lease data. In California, a solar loan for a homeowner who qualifies for the federal tax credit produces Year One savings of about four dollars. In the same California market, a real-world 25-year solar lease product yields savings of about $50 per year. To analogize to the Virginia market, to make a solar loan yield four dollars of Year One savings for a customer requires an upfront cash incentive of $6,500-$12,000.

3. Virginia allows local jurisdictions to exempt residential solar from property taxes. This can have a substantial impact on solar project economics. With a property tax exemption, the rebate necessary to achieve a first-year savings of about $5 for a 6.4-kw system is $4,750, assuming the federal tax credit could be used to offset the upfront cost of the system. Without a property tax exemption, the rebate necessary to achieve a first-year savings of $4-$5 is $6,500 under the same parameters.

4. Analyzing the financial models, we think it is reasonable to assume that approximately $6,500 in public subsidy project is necessary to ensure participating LMI households benefit from their solar transaction.

5. Assuming approximately $6,500 in direct public subsidy is necessary for each system installed and an initial pilot program financing budget of $200,000, about 30 cash-flow positive projects could be completed under the pilot.

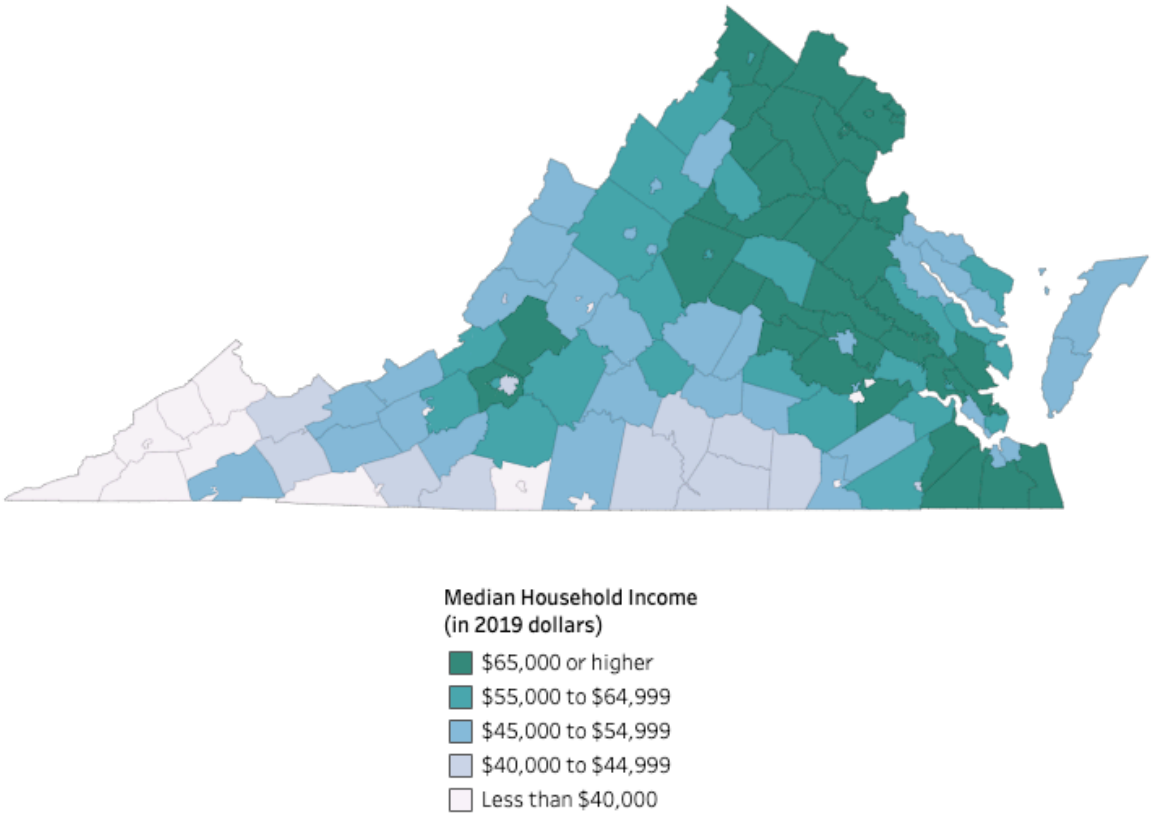
Virginia Income and Energy Burden Demographics

Virginia ranks 12th among US states in population and 14th in population density. The most populous areas of the Commonwealth are in the northeast part of the state (in the broader metropolitan area outside the District of Columbia), in and around metropolitan areas of Charlottesville, Richmond, and Roanoke, and in the southeastern part of the state (in the greater Virginia Beach metropolitan area).

Based on US Census Bureau data, the median household income in Virginia between 2015 and 2019 was $74,222, considerably above the 2019 US median household income of $65,712. The owner-occupied housing rate between 2015 and 2019 was 66.3%. Virginia's poverty rate (the percentage of a population whose income falls below the poverty line) in 2018 was 10.7%, which is below the national poverty rate of 13.1%. But despite Virginia's higher-than-national median household income and lower-than-national poverty rate, poverty and high energy burdens remain prevalent, especially in rural parts of the Commonwealth.

The figure below shows median household income ranges by county between 2015-2019 in Virginia.

Figure 1. Median Household Income by County (2015-2019)

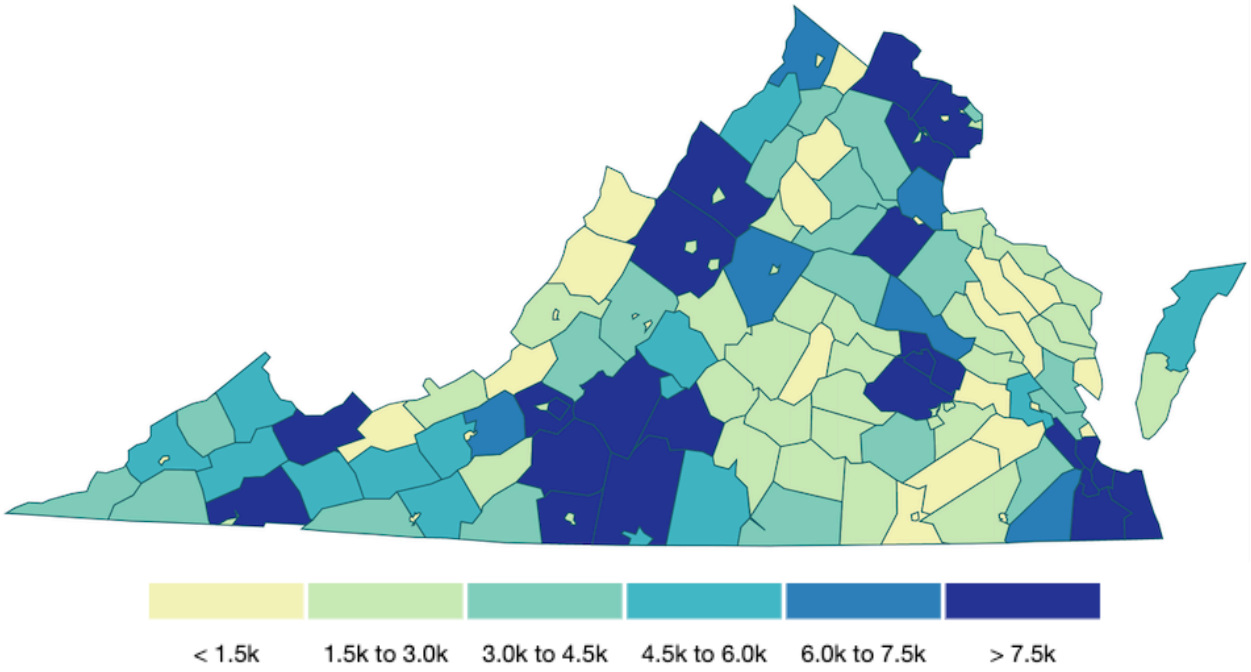


Source: US Census Bureau, https://www.census.gov/library/visualizations/interactive/acs-median-household-income-2015-2019.html

Unsurprisingly, median household incomes in more rural counties tend to be lower than in their population-dense counterparts.

The figure below shows low-income (80% or below the area median income), owner-occupied housing counts by county.

Figure 2. Low-Income, Owner-Occupied Housing Counts by County

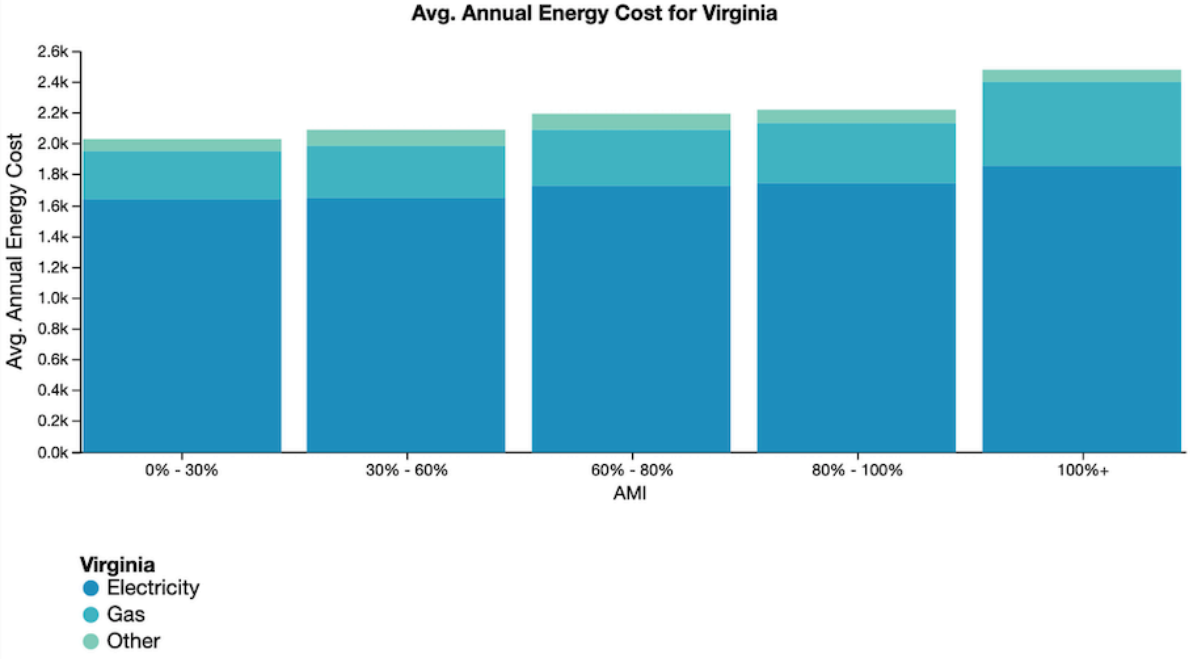


Source: US Department of Energy Low Income Energy Affordability Data (LEAD) Tool, https://www.energy.gov/eere/slsc/maps/lead-tool#

Low-income households living in owner-occupied homes are widespread in more densely populated counties, but the figure also indicates some concentrations in a handful of less population-dense counties (for example, Tazewell County in the southwestern region and Henry County in the southside region of the state).

The figure below shows the average annual energy cost for Virginia broken out by area median income stratification and by energy source (electricity, gas, and other).

Figure 3. Average Annual Energy Cost by Area Median Income Band

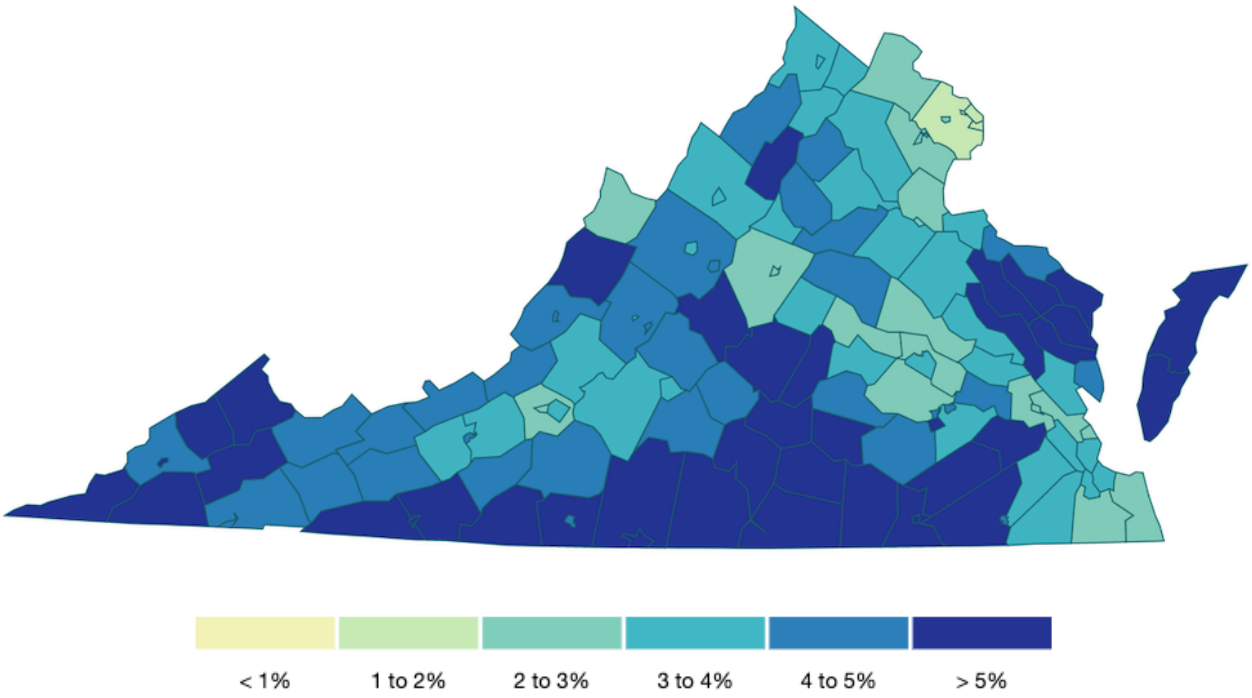


Source: US Department of Energy Low Income Energy Affordability Data (LEAD) Tool, https://www.energy.gov/eere/slsc/maps/lead-tool#

Virginia households in lower area median income stratifications tend to spend slightly less in gross on electricity annually, but as a percentage of income, this picture changes dramatically. Across the Commonwealth, the average energy burden for low-income, owner-occupied households is 8% according to the US Department of Energy LEAD Tool. An energy burden above 6% is typically considered a high energy burden.

The figure below shows the average energy burden (the percentage of gross household income spent on energy costs) by county.

Figure 3. Average Energy Burden by County



Source: US Department of Energy Low Income Energy Affordability Data (LEAD) Tool, https://www.energy.gov/eere/slsc/maps/lead-tool#

Darker blue counties—those with higher energy burdens—tend to be concentrated in the more rural parts of the state in the southwestern, southside, and eastern counties of Virginia.

Overall, Virginia's income and energy burden demographics demonstrate ample opportunity to deliver bill savings and reduce energy burdens for LMI owner-occupied homes in Virginia through a solar program targeted for this population.

Locational Variables

Knowing that a pilot with an initial budget of $200,000 can only reach a relatively small number of households (30, based on our rough approximation), we have begun to zero in on potential jurisdictions. Our basic assumption for zeroing in on potential target jurisdictions for a LMI solar pilot was that a program at the scale being contemplated would be focused in a few select communities so it could take advantage of focused marketing and community engagement and leverage economies of scale using a competitively selected installer model. Under a competitively selected installer model, DMME would be able to retain direct oversight controls over participating solar companies. Selected solar installers could offer cost-competitive pricing with increased installation volumes and targeted customer acquisition support.

Using analysis generated by DMME staff through the US Department of Energy's Low Income Energy Affordability Data (LEAD) Tool as our starting point, we assessed the following variables at the county and city level in Virginia:

Electric Utility Service Territory

Dominion Energy and Appalachian Power are in the process of developing LMI solar and efficiency programs. To avoid potential program redundancy, we gave preference to jurisdictions outside of the Dominion Energy and Appalachian Power service territory.

Energy Burden

We gave preference to jurisdictions with higher energy burdens—average annual energy expenditures as a percentage of annual household income. The 21 potential target locations all displayed high energy burdens (between 9 and 24 percent).

Single-Family Owner-Occupied Housing Count

Because the LMI renter population will be eligible to participate in Virginia's forthcoming shared solar program, we assumed that this LMI solar pilot program would target single-family homeowners. We gave slight preference to those cities and counties with higher single-family owner-occupied housing counts.

LMI Housing Count

We gave significant preference to jurisdictions with higher LMI housing counts. Since § 45.1-399 of the Code of Virginia dictates pilot program eligibility as "open to any Virginia resident whose household income is at or below 80 percent of the state median income or regional median income, whichever is greater," we used 80% area median income as our LMI thresholds for the purpose of our housing count.

Percentage of LMI Single-Family Housing

In addition to looking at LMI and single-family owner-occupied housing counts, we also explored the LMI single-family housing count as a percentage of the total housing count for Virginia. This gave us a sense of the density of LMI single-family homes within each jurisdiction.

Population

We assessed the overall population of the potential target jurisdictions we zeroed in on to ensure that there would be an adequate population base in selected jurisdictions to enable a pilot to generate sufficient program enrollment. Overall jurisdictional population numbers also helped us diversify our potential pilot locations between urban and rural geographies. Hopewell has a significantly higher population than the other cities we identified as potential targets.

Solar Property Tax Exemption Status

Virginia law allows cities and counties to exempt or partially exempt solar equipment from local property taxes. Solar property tax exemption reduces the amount of public subsidy necessary to ensure cashflow positive solar transactions for LMI customers and can have a substantial impact on residential solar project economics. Thus, we gave preference to those that jurisdictions that provided solar property tax exemptions.

Potential Target Jurisdictions

Weighing all these factors, we arrived at a list of 21 potential target jurisdictions for consideration. Below is a table of the potential jurisdictions we derived in our assessment.

Table 1. Table of Potential Jurisdictions with Data on Locational Variables

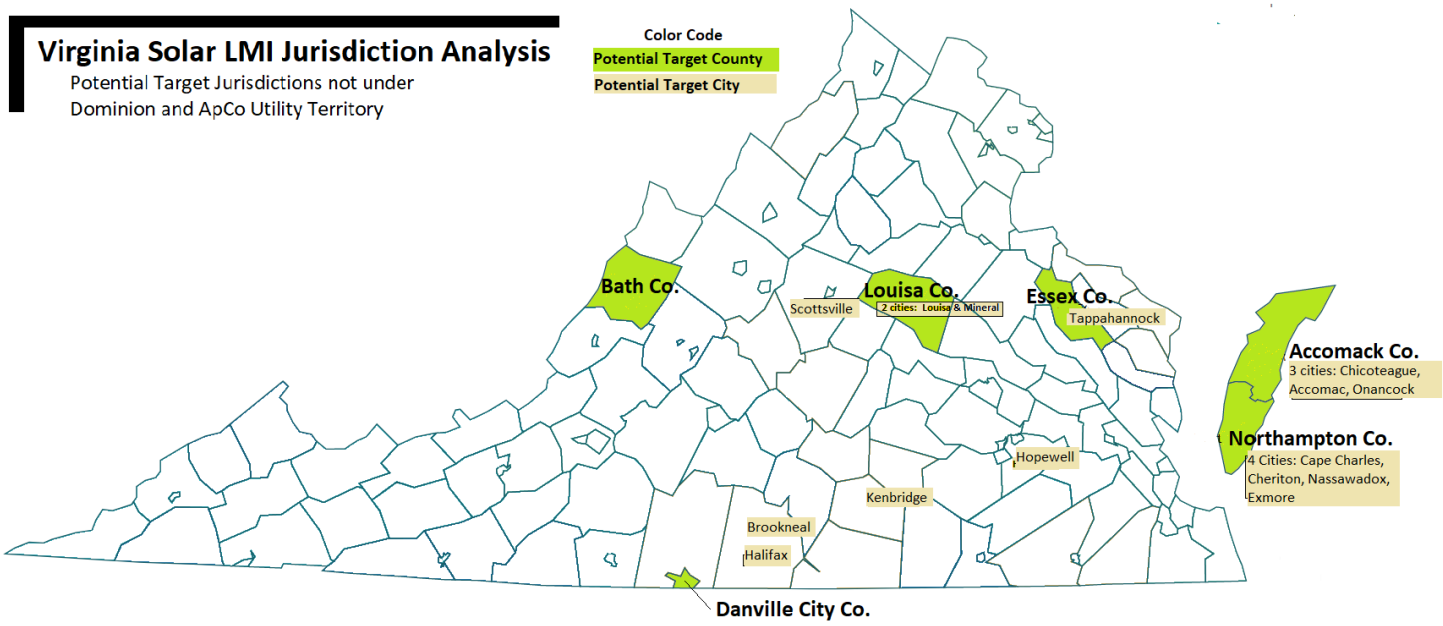
Jurisdiction Type	Jurisdiction	Solary Property Tax Exemption	Avg. Energy Burden (% income)	Avg. Annual Energy Cost	% LMI Housing Counts (All/LMI)	LMI Housing Counts	All Housing Count	Population	Primary Utility Service Territory
County	Danville city County	Y	19	4566	37%	1105	2979	38,834	Danville Utilites
County	Accomack County	N	14	3119	26%	1025	4018	31,786	A&N Electric Cooperative
City	Chincoteague	N	24	4847	23%	127	557	2,913	A&N Electric Cooperative
City	Tappahannock	N	14	2701	31%	105	337	2,380	Rappahannock Electric Cooperative
City	Cape Charles	N	14	3097	28%	56	199	990	A&N Electric Cooperative
County	Northampton County	N	14	2932	23%	351	1549	11,608	A&N Electric Cooperative
County	Essex County	N	14	2846	22%	398	1849	11,067	Rappahannock Electric Cooperative
City	Louisa	N	10	2638	34%	74	217	1,610	Rappahannock Electric Cooperative
County	Louisa County	N	10	2799	26%	1592	6123	39,205	Rappahannock Electric Cooperative
City	Scottsville	Y	9	3060	44%	61	138	597	Central Virginia Electric Cooperative
City	Accomac	N	14	2739	29%	15	51	496	A&N Electric Cooperative
County	Bath County	N	12	2878	35%	160	457	3,935	BARC Electric Cooperative
City	Hopewell	N	8	2514	51%	1386	2734	22,196	Prince George Electric Cooperative
City	Cheriton	N	14	3097	28%	14	50	477	A&N Electric Cooperative
City	Onancock	N	14	2678	24%	49	203	1,262	A&N Electric Cooperative
City	Nassawadox	N	13	2823	21%	10	48	495	A&N Electric Cooperative
City	Exmore	N	13	2823	21%	32	154	1,445	A&N Electric Cooperative
City	Brookneal	N	13	2908	21%	26	126	1,115	Southside Electirc Cooperative
City	Halifax	N	12	2698	34%	52	151	1,252	Mecklenburg Electtric Cooperative
City	Kenbridge	N	12	2828	32%	37	116	1,241	Southisde Electric Cooperative
City	Mineral	N	11	2965	26%	21	80	510	Rappahannock Electric Cooperative

Table 2. Potential Target Jurisdictions and Their Primary Electric Utilities

21 Target Jurisdictions		8 Electric Cooperatives
Potential Target	**Potential Target Cities**	**Primary Utility Service Territory**
Accomack County	(3) Chincoteague, Accomac, Onancock	A&N Electric Cooperative
Louisa County	(2) Louisa, Mineral	Rappahannock Electric Cooperative
Northampton County	(4) Cape Charles, Cheriton, Nassawadox, Exmore	A&N Electric Cooperative
Bath County		BARC Electric Cooperative
Essex County		Rappahannock Electric Cooperative
Danville city County		Danville Utilities
	Brookneal, Halifax	Mecklenburg Electric Cooperative
	Tappahannock	Rappahannock Electric Cooperative
	Hopewell	Prince George Electric Cooperative

Kenbridge	Southside Electric Cooperative
Scottsville	Central Virginia Electric Cooperative

Figure 4. Map of Potential Target Jurisdictions



Next Steps

With input from DMME, the CEAB, and stakeholders on the ground in these jurisdictions, we plan to narrow down our list of potential target jurisdictions to two or three, which we will put forward as proposed locations for a pilot. Key stakeholders to solicit input from within the potential target jurisdictions include community-based organizations, Weatherization Assistance Program providers, local electric utility representative, municipal officials, local solar installers, and single-family affordable housing providers.

Statutory Considerations

Various considerations emerged as we began to outline LMI solar pilot design possibilities and more deeply delve into the program's authorizing legislation:

Third-Party Solar System Ownership

As noted above, third-party residential solar system ownership structures hold promise for solar programs for LMI homeowners because they enable monetization of the federal solar tax credit and reduce capital investment burdens on participating LMI households, but their legality is somewhat uncertain in Virginia. Attorneys for the Commonwealth are exploring this issue further. Resolving this issue will be helpful for LMI solar pilot program development.

Income Threshold

The enabling statue for Virginia's LMI solar pilot calls for the program to "be open to any Virginia resident whose household income is at or below 80 percent of the state median income or regional median income, whichever is greater." Virginia's Weatherization Assistance Program (WAP) income guidelines follow the state Low-Income Heating Assistance Program (LIHEAP) limit of 60% state median income (SMI) or below for households of seven or less. Independently verifying LMI solar pilot program eligibility at a differently threshold than is used by other social service programs in Virginia could present a heavy administrative burden. Since WAP and LIHEAP eligibility currently cap at 60% SMI in Virginia, we suggest focusing the solar pilot for LMI homeowners on those who have already qualified for WAP or LIHEAP. Leveraging existing programs' income verification will make intake and customer qualification much less burdensome for an LMI solar pilot. If the pilot program is expanded at a later date, the target income band could be enlarged at that time.

Requirement to Demonstrate Reduced Energy Consumption through Prior Efficiency Upgrades

Section 45.1-399(B)(iii) of the enabling statue for Virginia's LMI solar pilot requires that program applicants demonstrate prior energy efficiency upgrades resulting in a reduction of energy consumption at least 12 percent. The CEAB 2020 Annual Report suggests "using WAP program audits and final work scopes with a Savings to Investment Ratio (SIR) of greater than 1.0 for energy efficiency measures as a proxy for the 12% reduction in energy consumption required in the Virginia Code to qualify WAP customers for eligibility under the LMI Solar Loan and Rebate program." We are strongly inclined to follow the CEAB's recommendation here. The CEAB's Annual Report notes, "A reasonable interpretation of the Virginia Code allows for a reduction to be measured in terms of dollar cost savings, so that both electric and fuel savings can be included and stated as a single metric." We agree. Further exploration and coordination with WAP providers will be necessary for demonstrating SIR scores of greater than 1.0 for pilot program eligibility.

Incentive Payment

The enabling statute for the LMI solar pilot requires any loans or rebates issued under the program to be remitted within 60 days of the receipt of the claim. This suggests that the structure of the LMI incentive under the program will be issued as a lump-sum payment. We think a lump-sum incentive is workable if it can be effectively factored into the system cost so it reduces LMI customers' monthly loan, solar lease, or solar power purchase agreement payments.

Incentive Cap

Section 45.1-399(G) of the enabling statue for Virginia's LMI solar pilot states that "[a]ny rebate or grant shall be in the amount of no more than $2 per DC watt for up to six kilowatts of solar capacity installed." We interpret this provision to be a cap on the incentive amount, not on the allowable system size under the pilot program. We think that it is likely that system sizes could exceed six kilowatts under the pilot since the median residential solar system size is over six kilowatts in the US.

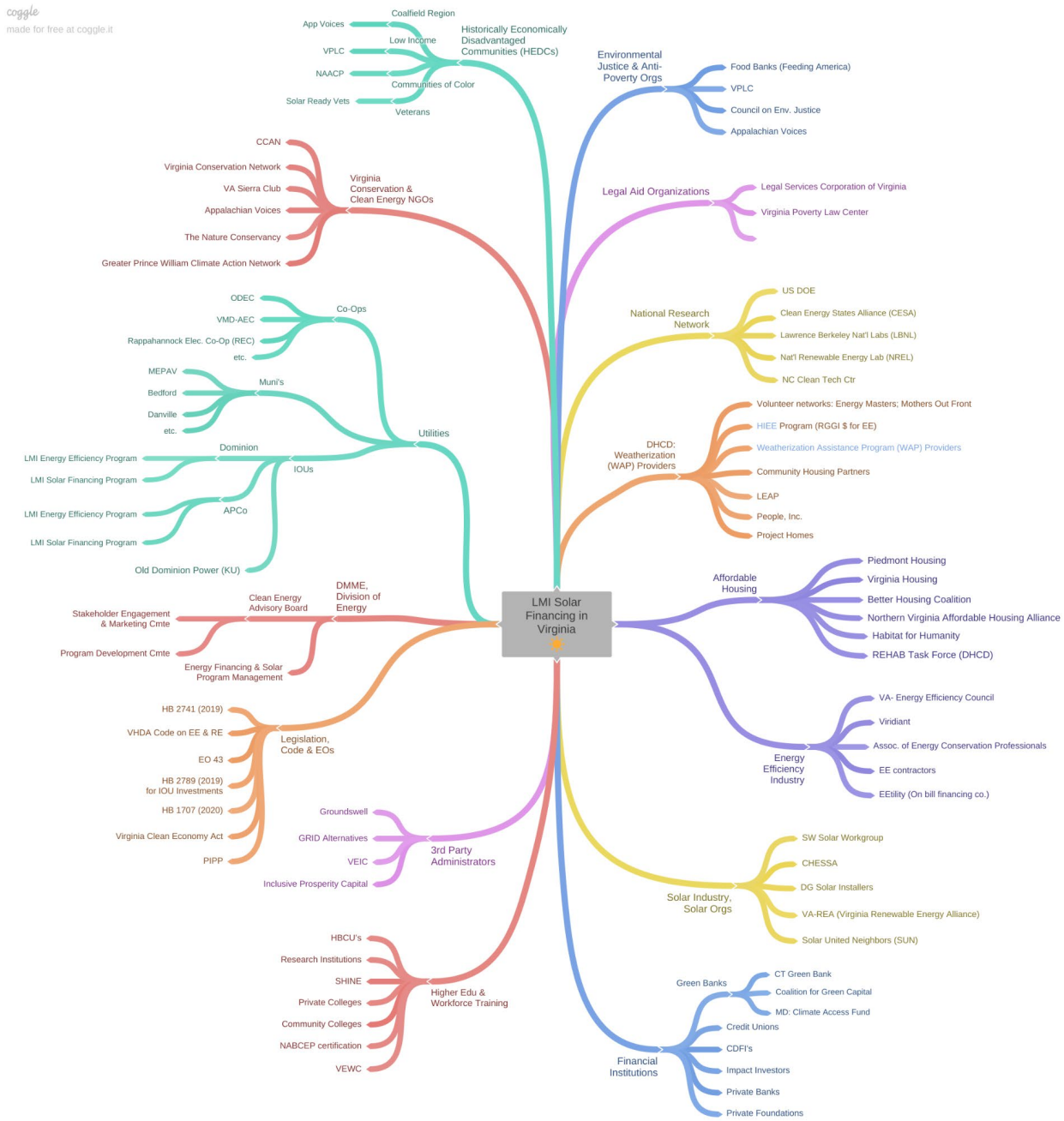
Conclusion

Overall, Virginia is well-primed for the launch a solar program for LMI homeowners. The Commonwealth has a statutory directive to launch a LMI solar pilot program, and a surge of solar-friendly policies have opened up the residential solar market in Virginia considerably in recent years. But considerable work lies ahead to get a pilot off the ground under existing resource and statutory constraints.

A significant part of the challenge for LMI solar pilot program development comes down to project economics. Virginia's relatively low cost of electricity makes it difficult to pencil out residential solar projects for LMI households.

We welcome feedback from DMME and the CEAB on our research and initial program design considerations.

Appendix G: LMI Solar Stakeholder Map



A high resolution version of this stakeholder map can be found online [here via Coggle.it]