Developing a Solar Pilot Program for Low-and Moderate-Income Households in Virginia

Virginia Clean Energy Advisory Board Meeting

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Clean Energy States Alliance

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Presentation Overview

- **CESA's Workplan and Summary of Findings**
- **Pilot Program Design Recommendations**
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  2. System Ownership
  3. Demonstrating Reduced Energy Consumption
  4. Local Installer Requirement
  5. Incentive Payment
  6. Incentive Cap
  7. Income Threshold
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  9. Locational Variables and Potential Pilot Jurisdictions
- **Next Steps**
- **Recommendations Recap**
- **Q&A**

CESA Work Plan

- CESA was awarded an anonymous grant to assist DMME and the CEAB in the development of a solar pilot for low- and moderate- income (LMI) households in Virginia over the course of one year.
- Our overall aim is to launch a successful pilot program that can be scaled and that will help demonstrate the case for long-term program investment and expansion.
- In March, CESA presented background market research to the CEAB. After receiving feedback from the CEAB and DMME staff, we expanded our pilot program selection variables and re-examined potential jurisdictions for a pilot. In conjunction with DMME, we conducted informational interviews with solar providers that offer residential solar leases in other state markets.
- We will present our pilot design recommendations today. With the CEAB's approval, we plan to develop these recommendations into a draft program solicitation.

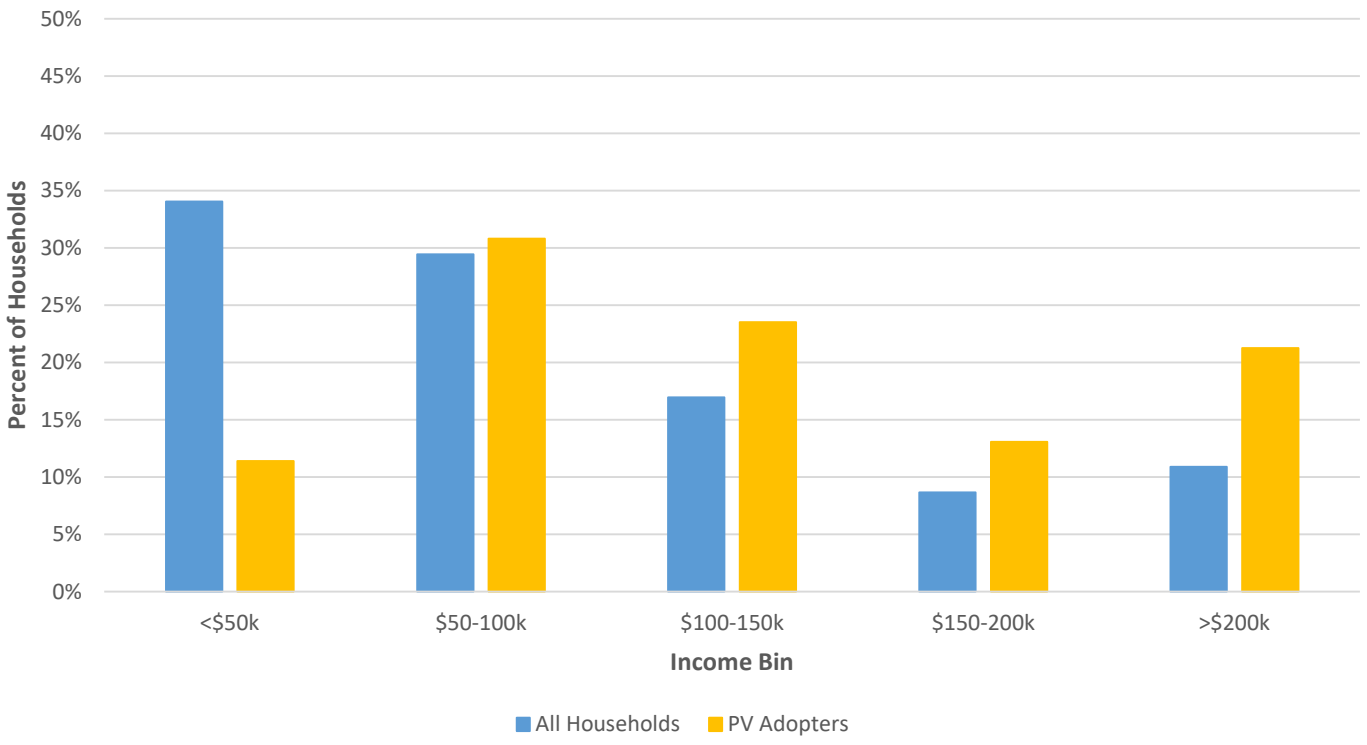
Summary of Findings

- Virginia's Low-to-Moderate Income Solar Loan and Rebate Fund is currently capitalized with $200,000 in re-purposed federal American Recovery and Reinvestment Act (ARRA) funds.
  - No other funding for the program has been secured to date.
- Market economics in Virginia make it difficult for residential solar projects for LMI households to pencil out.
- A 25-year lease offers preferable financing terms for LMI homeowners in Virginia.
- Solar property tax exemption has an impact on the amount of subsidy needed to achieve cashflow positive solar transactions for Virginians.
- Our estimates show that about $6,500 in public subsidy per solar project will be necessary to ensure participating LMI households benefit from their solar transactions.
- 30 solar installations could be completed under the pilot assuming an initial pilot program financing budget of $200,000 and approximately $6,500 in direct public subsidy per project.

Income Distribution of PV Adopters: Virginia

Based on all PV systems installed from 2010 to 2019

Income Distribution by Census Income Groups



Notes: *The income distribution for PV adopters is based on Experian estimated incomes for systems in Berkeley Lab's dataset, while the income distribution for all households is directly from the U.S. Census.*

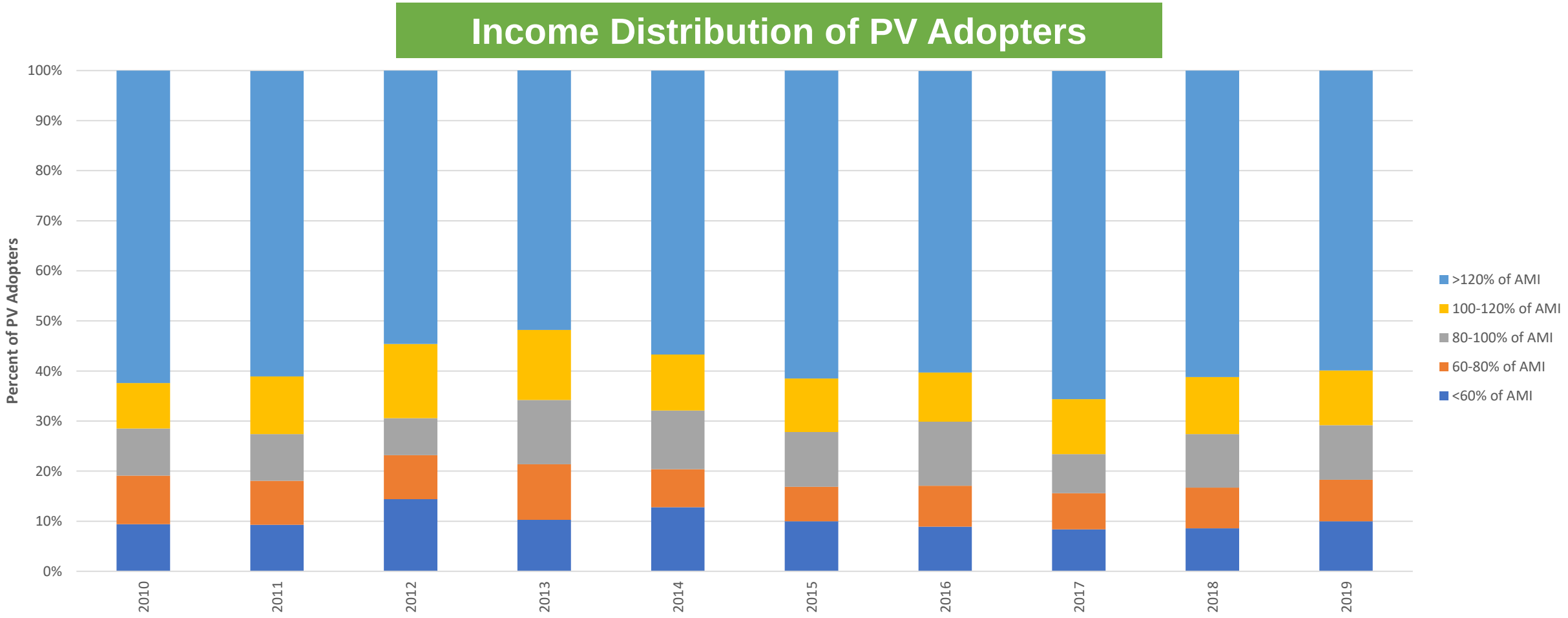
Specific Income Groups of Interest

Income Group*	Percent of PV Adopters
<60% of AMI	10%
60-80% of AMI	8%
80-100% of AMI	11%
100-120% of AMI	11%
≥120% of AMI	60%

General note on PV-adopter incomes:
These values are estimates developed by Experian, based on a statistical model trained to household-level survey data. As such, they entail some level of uncertainty.

PV Adopter Income Trends over Time: Virginia

According to year of installation (2010-2019)



Notes: *The time period shown in the figure is based on the set of years for which we have sufficient data. Income levels for PV adopters in each year are based on the estimated current income of those households, not the income at the time of installation.*

Recommended Pilot Structure

- The pilot focuses on LMI single-family homeowners who have previously participated in weatherization services.
- DMME competitively selects solar companies and provides support and outreach assistance for them to reach underserved markets.
- The pilot uses focused, inclusive, and community-based marketing campaigns to reach 2-3 selected underserved communities.
- The program guarantees that solar projects are structured with contracts that are cashflow positive for LMI participants and have no hidden fees.
- The program provides direct oversight controls over participating solar companies.

Other Pilot Program Design Considerations

System Ownership

- A third-party system ownership model can stretch pilot program dollars further, but how residential solar leases and PPAs are regulated in Virginia is somewhat uncertain.
- We are not aware of any solar companies that are currently residential solar lease products in Virginia.

Recommendation: Draft the solicitation with open-ended financing terms.

Comparing Residential Solar Financing Models

	Solar Leases	Residential Solar PPAs	Solar Loans/Direct Purchase
Who buys the system?	Third-party developer.	Third-party developer.	Homeowner.
Who owns the system?	Third-party developer.	Third-party developer.	Homeowner.
Who takes advantage of most of the federal and state solar incentives?	Third-party developer.	Third-party developer.	Homeowner.
Who is responsible for operations and maintenance of the solar system?	Usually the third-party developer.	Third-party developer.	Homeowner, though some state incentive programs require installers to provide a workmanship warranty for a set period.
Who incurs the risk of damage?	Third-party developer.	Third-party developer.	Homeowner.
What happens if the homeowner sells the home where the solar system is located?	Depends on the contract, but most leases allow the new buyers to take over the lease at contract terms.	Depends on the contract, but most PPAs allow the new buyers to take over the PPA at contract terms.	If the homeowner finances the system through a loan, the homeowner remains responsible for loan payments after the transfer unless negotiated with the buyer.
Are financing payments fixed?	Yes, payments are pre-set but may include an annual escalator, increasing payments each year.	No. Payments to the third-party owner are on a per kilowatt-hour basis based on electricity generated by the solar array. Per kilowatt-hour payments may include an annual escalator.	If the homeowner finances the system through a loan, the loan payments will be fixed. If the homeowner decides to purchase a system outright, a contractor may sometimes offer several payment installments instead of one lump sum.
What contract duration terms are available?	Terms can vary.	Terms can vary, but often in the range of about 20 years.	If the homeowner finances the system through a loan, the loan terms can vary.
Does this type of financing arrangement require a down payment?	Not necessarily; down payment requirements vary.	Not necessarily; down payment requirements vary.	If the homeowner finances the system through a loan, down payment requirements can vary.
Is this type of financing arrangement widely available?	No. Solar leasing is only available in some states. Some states regulate the sale of electricity in ways that effectively preclude solar leases.	No. PPAs are only available in some states. Some states regulate the sale of electricity in ways that effectively preclude residential solar PPAs.	Yes. Solar and energy improvement loans are increasingly available. A homeowner can always directly cash-purchase a solar system.
Do contracts provide minimum production guarantees?	Yes, usually. Solar lease providers commonly provide minimum production guarantees.	Yes, usually. PPA providers commonly provide minimum production guarantees.	A loan contract does not include production guarantees. A solar panel manufacturer or developer/installer may provide a production guarantee.
Are there escalator clauses in the contract?	Sometimes. Check the specific terms.	Sometimes. Check the specific terms.	If the homeowner finances the system through a loan, interest rates may increase over time depending upon the loan terms.
Is insurance coverage provided?	Yes.	Yes.	No. Homeowners who directly own their solar system and want to be covered will need to find coverage either through a homeowner's existing insurance policy or through the purchase of a new or expanded policy. Homeowners may decide to forgo insurance coverage altogether and bear the risks.

Demonstrating Prior Reduced Energy Consumption

- § 45.1-399(B)(iii): "Each application shall include…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…to demonstrate that such energy efficiency services were completed and resulted in a reduction in consumption of at least 12 percent…"
- This provision presents some ambiguity about how such a "reduction in consumption" might be demonstrated (e.g., electric, thermal, or both) and could present challenges for pilot eligibility.

Recommendation: Rely on Weatherization Assistance Program audits and final work scopes with a Savings to Investment Ratio (SIR) of greater than 1.0 for energy efficiency measures to serve as a proxy for the 12% reduction in energy consumption requirement.

Local Installer Requirement

- § 45.1-399(E)(iv): "All of the work of installing the energy system shall be completed by a licensed contractor that…has installed a minimum of 150 net-metered residential solar systems in Virginia."

Recommendation: Allow solar providers who contract with local installers to satisfy this statutory requirement.

Incentive Payment

- § 45.1-399(G): "…The Director shall disburse from the Low-to-Moderate Income Solar Loan and Rebate Fund … 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."
- This provision points toward an LMI incentive issued as a lump-sum payment, not ongoing payments over the lifetime of a lease, loan, or solar power purchase agreement.

Recommendation: A lump-sum incentive payment should be factored into the system cost so it reduces LMI customers' monthly loan, solar lease, or solar power purchase agreement payments.

Incentive Cap

- § 45.1-399(G): "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."

Recommendation: Interpret this to be a cap on the incentive amount, not on the allowable system size under the pilot program.

Income Threshold

- § 45.1-399(A): "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*."
- 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 different threshold than is used by other social service programs in Virginia could be administratively burdensome.

Recommendation: Focus the pilot on LMI homeowners who have already qualified for WAP or LIHEAP (at 60% SMI in Virginia) to streamline eligibility verification.

Pilot Locations

- § 45.1-399(A): "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."
- Limiting the pilot to particular jurisdictions within Virginia might run afoul of the statutory provision to make the program open to any Virginia resident.

Recommendation: Allow pilot participation by any Virginia resident but focus marketing campaigns in selected jurisdictions.

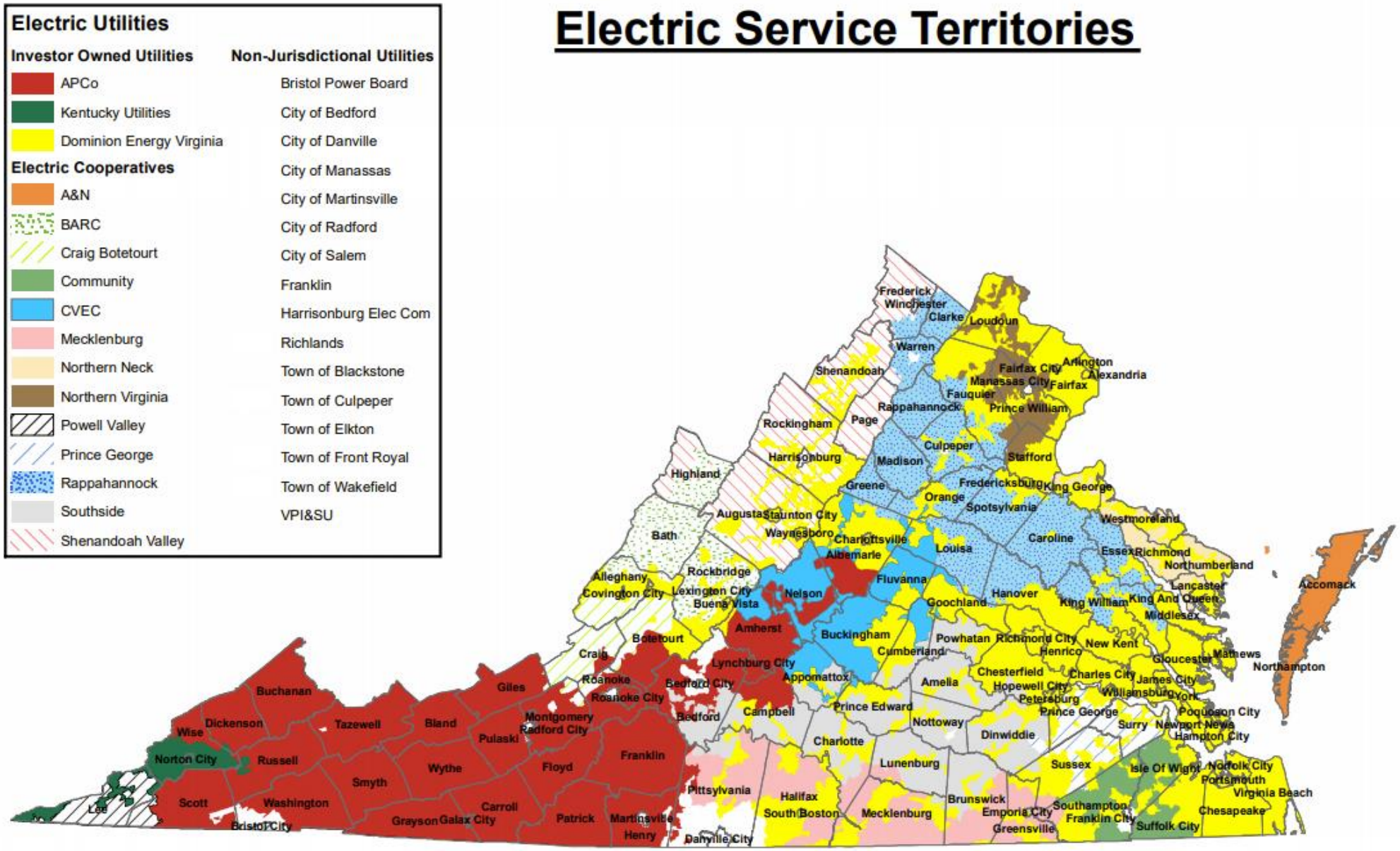
Locational Variables

Variables assessed for pilot program development include:

- Cities and counties
- Utility Service territory
- Solar Property Tax Exemption Status
- Energy burden and costs
- Population and demographics
- Income information (median income, area median income, state median income)

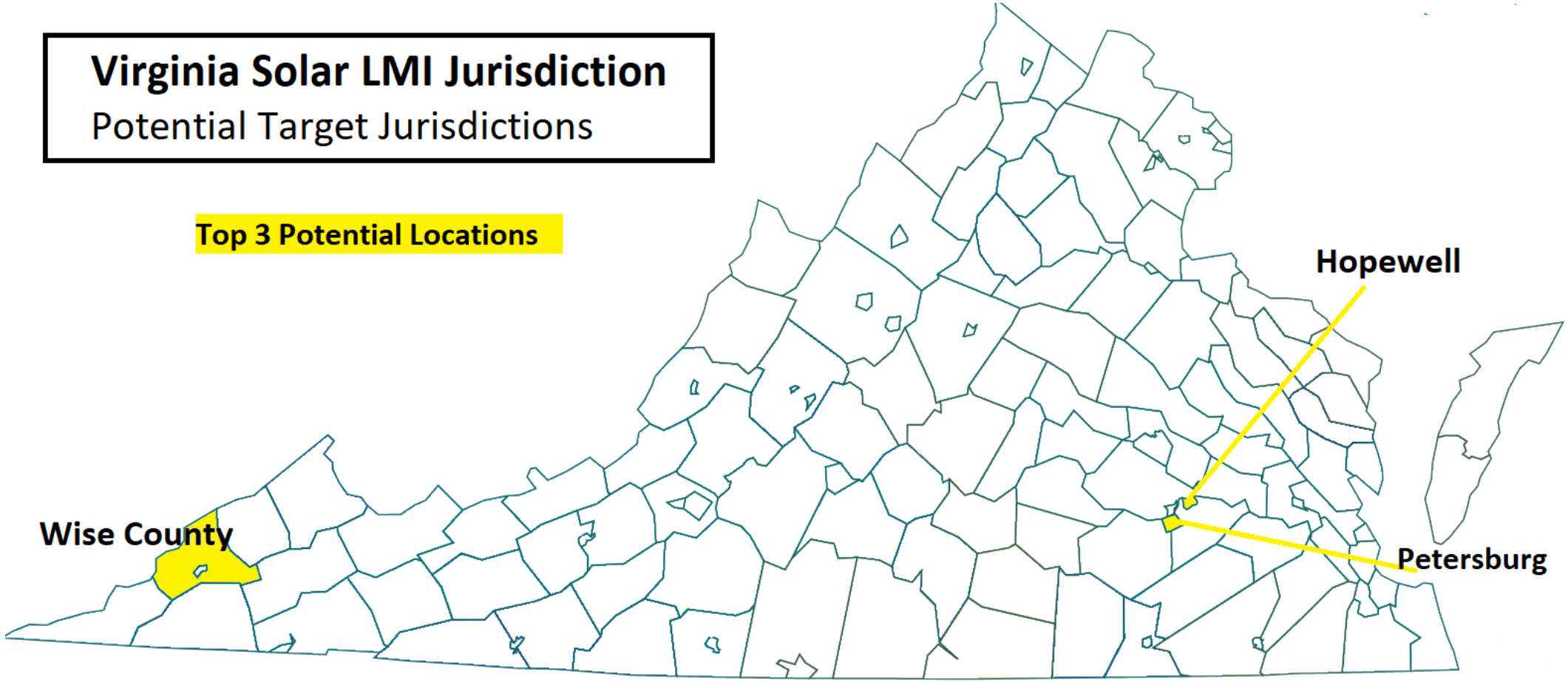
Feedback from the March CEAB meeting informed the expansion of variables

Electric Service Territories



Potential Pilot Locations: Top 3

- Hopewell
- Petersburg
- Wise County



Potential Pilot Locations: Top 3

	Hopewell	Petersburg	Wise County
Income (2019)	Median Annual : $41,600 46.5% of AMI, 56.1% SMI	Median Annual : $39,843 44.6% of AMI, 53.7% of SMI	Median Annual : $38,880 77.3% of AMI, 52.4% SMI
% Population of Color (2019)	54%	85%	7.5%
Virginia Region	Central	Central	Southwest
Utility Service Territory	Dominion Energy	Dominion Energy	Appalachian Power Old Dominion Powell Valley TN ODP Kentucky
Solar Development	Solar Property Tax Exempt-at county level		SolSmart Silver – receptive to solar development

Next Steps

1. Approve core program design recommendations
2. In conjunction with the CEAB Stakeholder Engagement and Marketing Committee, conduct outreach to stakeholders in pilot jurisdictions (community-based organizations, weatherization service providers, local utilities, municipal officials, solar installers, single-family affordable housing providers, and other) to solicit input on program design and viability
3. Develop a timeline for pilot program development
4. Draft a solicitation for solar providers for the pilot

Pilot Recommendations Recap

1. Focus on LMI single-family homeowners who have already qualified for WAP or LIHEAP (at 60% SMI in Virginia) to streamline eligibility verification
   - Rely on WAP audits and final work scopes with a Savings to Investment Ratio (SIR) of greater than 1.0 for energy efficiency measures to serve as a proxy for the 12% reduction in energy consumption requirement
2. Competitively select solar companies and provide outreach assistance to help them to reach underserved markets
   - Issue a solicitation with open-ended financing terms but provide an economic analysis demonstrating the cost-effectiveness of third-party ownership
   - Allow solar providers who contract with local installation companies to satisfy the local installer requirement
3. Use focused, community-based marketing campaigns to reach 2-3 selected underserved Virginia communities
   - Allow pilot participation by any Virginia resident but focus marketing campaigns in selected jurisdictions
   - Explore the cities of Hopewell and Petersburg and Wise County as potential locations for the pilot and conduct outreach to stakeholders in these jurisdictions to probe program viability
4. Guarantee that solar projects are structured with cashflow positive contracts for participating LMI households
   - Structure the incentive payment as a lump-sum, reducing customers' financing payments over time
   - Provide direct oversight controls over participating solar companies to ensure robust consumer protection

Questions or Comments?

Thank You

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