Decarbonizing Virginia's Economy: Pathways to 2050 Workshop

Summary of Participant Input

30 November 2020

Executive Summary

On October 30, 2020 the Energy Transition Initiative (ETI) at the Weldon Cooper Center for Public Service (WCC) partnered with the Institute for Engagement & Negotiation (IEN), both with the University of Virginia, to host a virtual workshop that solicited reactions and input on new economic modeling around how Virginia might achieve a carbon neutral economy. Decarbonizing Virginia's energy system will drive major changes in how the Commonwealth generates its electricity, heats its buildings, powers its vehicles, and charts its economic future. The workshop included a presentation of ETI's modeling, which presented several economic scenarios that might achieve the goal of carbon neutrality for Virginia by 2050. Following a presentation on the modeling, participants were assigned to four breakout group discussions organized around key topics: **Utility Solar** (11 participants), **Grid Transformation** (10 participants), **Transportation** (7 participants), and **Buildings + Distributed Solar** (8 participants). In these breakout groups, participants considered pathways that deliver decarbonization at least cost in comparison with alternative future scenarios, and weighed in key issues and opportunities. The purpose of gathering this input is to help shape current and future discussions around Virginia's energy policies and programs. This stakeholder engagement process was the first of many the ETI hopes to convene as Virginia transitions to a clean and equitable energy economy.

This brief presents an anonymized, aggregated summary of themes and prevalent ideas offered by workshop participants. The appendix includes a list of attendees, the workshop agenda, and curated notes for each breakout group.

A high-level synthesis of top opportunities identified in each breakout discussion is presented below:

Utility Scale Solar – Top Opportunities

- The PJM Interconnection process is slowing solar development by adding friction to the process of siting solar facilities, demonstrating that it cannot handle the current level of solar development.
- Some localities are prepared to support/permit solar development, but would benefit from additional resources, tools, recommendations, and information.
- Planning to optimize land use change is going to be extremely important. There is a need to work with regions to optimize the siting and land use plans and implementation.

Grid Transformation – Top Opportunities

- Realizing the full potential of distributed energy resources can be accomplished by allowing more local or decentralized control over management of resources.
- Grid Modernization should be considered on multiple levels. Currently there is a disconnect between electricity planning and community planning. There is an important opportunity to improve outcomes by bringing those planning processes together, supported by state level coordination.
- There is a significant opportunity to strengthen workforce development and ensure that underrepresented communities gain the skills and training required in the clean energy labor market.

Transportation – Top Opportunities

- There is an opportunity for the transportation sector to provide greater transparency into how government funds are currently being allocated towards decarbonization.
- There is an opportunity to provide economic tools that make the case to policy makers to accelerate this process.
- There is a need for assistance programs and incentives that help low-and-moderate income households to access new transportation technology and change consumption and carbon emission patterns.

Building Sector – Top Opportunities

- There is an opportunity to accelerate and improve the building code adoption, compliance enforcement, and education process.
- More education and implementation programs are needed to help lower-income communities access the benefits of investments in energy efficiency.
- Community incentives for solar adoption should be significantly scaled up.
- Establishing a state target for what percentage of energy generation should come from distributed solar to power buildings would expedite implementation.

In addition to the issues and opportunities captured above, all four breakout groups emphasized the importance of centering equity and listening to historically disadvantaged communities in shaping all aspects of energy planning and implementation. While questions around energy equity were integrated across all discussions, it was acknowledged and emphasized that future stakeholder engagements must do more to engage diverse communities.

Overview

The three-hour virtual workshop (conducted on Zoom) featured a presentation by Bill Shobe of the Energy Transition Initiative (ETI) at the Weldon Cooper Center for Public Service (WCC) followed by breakout groups conversations with stakeholders directly invited to attend. The workshop was designed and facilitated by the Institute for Engagement & Negotiation (IEN). With a mission to "catalyze and facilitate the shared creation of equitable solutions," IEN has a 40-year history of providing facilitation, strategic planning, and multi-party negotiation services to Virginia's communities and institutions.

A total of 81 stakeholders with clean energy expertise across the government, industry, small business, legal, and advocacy sectors were invited to participate. A total of 45 attended the workshop. Participants were invited to list their preference of breakout group topics in a pre-workshop survey, and nearly all participants were placed in their "top choice" conversation. The four breakout topics – Utility Solar, Grid Transformation, Transportation, and Buildings + Distributed Solar – were chosen because they are components of the decarbonization transition that workshop organizers believe require near-term policy attention. Utility scale solar development is an essential element of successful decarbonization under any scenario, so it is vitally important to thoroughly examine and overcome any barriers to scaling up these resources in ways that are sensitive to the needs of localities, communities, landscapes, and natural resources. Given that it has taken decades to develop a centralized grid dominated by centralized utility providers, grid modernization to accommodate decentralized energy sources

will be a highly technical, complex, and extensive process. The workshop recognized the importance of beginning now to critically reconceptualize the grid and determine how fundamental transformation can be accomplished within current policy frameworks and precedents. The transportation sector generates nearly 50% of Virginia's total carbon emissions. Rapid electrification of transportation and the use of biofuels will be necessary to reach net zero emissions. There is a considerable opportunity to update Virginia's building codes and to increase incentives and programs that ensure all Virginia's communities begin to benefit from more efficient buildings and distributed renewable energy. As emphasized in the modeling presentation, the sooner Virginia acts to mandate and incentivize progress in these areas, the less expensive and more successful the transition will be.

Workshop participants were prompted to consider issues of equity and environmental justice in all breakout discussions. Despite efforts to invite participation representative of diverse communities, participants appropriately acknowledged that this event fell short of this goal. ETI agrees that more diverse and robust conversations are necessary to consider issues of equity in clean energy, and looks forward to pursuing future engagements at both the statewide and regional levels.

The sections below present key themes and ideas that emerged within each breakout group conversation. Each group was staffed by an IEN facilitator and notetaker as well as a Subject Matter Expert (SME) from the Energy Transition Initiative. Following these anonymized, aggregated summaries, an appendix includes a list of participants, a copy of the workshop agenda, and a set of curated notes that present more detailed insights and ideas shared by participants.

Advancing Development of the Utility Scale Solar Sector

Key themes of discussion around utility scale solar included:

- *A pressing need for increased state and local policy coordination and transparency;*
- *Opportunities to work with localities to assess their individual needs and find solutions that benefit marginalized community members; and*
- *Incentives and barriers to the development of utility scale solar generation and storage.*

The ETI economic modeling projects solar occupation of 1% of Virginia's land area by 2050. This is likely an understatement given that 395 square miles is built out under Dominion's IRP which does not include data centers and other proprietary sources of generation nor cost supply curve. This large-scale use of land will especially affect agricultural communities and the local economy. Many participants expressed concerns over potentially harmful impacts on natural resources due to the expansion of utility scale solar. Policy to mitigate habitat loss should be critically examined to ensure it is effective in achieving equitable and high-quality outcomes for natural resources and communities.

Participants reflected that Virginia's current land use policies and regulations create barriers to the expansion of utility scale solar and storage. They emphasized the need for early connectivity between state and local governments to begin to accelerate the approval process for solar development. Local governments will have to examine zoning codes and garner community input. This highlights a state-level need to increase support of local governments in order for them to obtain the information needed and carry out meaningful public engagement. The current permitting process requires separate approval process for energy storage from the SCC and solar construction from DEQ. This workgroup identified a need for more information on the amount of storage that will be needed by and for localities, so they can incorporate storage planning into the overall process. Participants also discussed the potential in removing caps on net-metering which would allow residential and commercial customers generating electricity from solar power to sell the excess energy back into the grid.

Participants were asked to consider the current policy framework in terms of the role of state and local governments and to identify any concerns or potential changes in policy that would have the greatest impact in scaling up solar development. The conversation focused on the need for local and state governments to clearly define their roles and responsibilities in order to allow for transparent and concise policies, procedures, and processes. In creating strong, effective policies, state and local governments could better incentivize development and raise the target level of solar on previously distributed lands.

The Virginia Clean Economy Act is clear that this energy transition shall be planned with consideration to equity for historically disadvantaged communities. This group was asked to consider the key challenges and opportunities related to equity in solar expansion. Participants called for increased outreach to environmental justice groups and rural communities such as New Virginia Majority, Environmental Justice Collaborative (Council on Environmental Justice), Black Family Land Trust, and the Southeast Rural Community Assistance Project. In order to achieve a clean and equitable energy system, it will be crucial to bring this conversation to communities, and especially to historically disadvantaged farmers, to enable them to benefit financially from solar expansion.

A common theme of this breakout conversation was to proceed with caution in scaling up solar development in order to ensure that the historically significant agricultural and forestry sector, Virginia's largest economic force, is not undermined by the rapid growth of solar. Dominion Energy is in the process of mapping capacity for solar development, which may prove helpful to localities in anticipating and preparing for siting agreements. But even as localities adapt, any siting agreements should respect the needs at the local level as well as the great variability in local issues and opportunities, which differ from county to county. Uniform requirements could stall development.

In order to improve the adoption of utility-scale solar in Virginia it is important to start focusing on grid modernization in areas where solar development is non-controversial. As highlighted by

this breakout group session, it will be necessary to reduce barriers to entry by improving policy coordination between state and local governments and facilitating community input. Additionally, solar expansion will be made easier through integrating permitting of solar and storage as well as adopting net-metering.

Advancing Development of Grid Transformation

Key themes of discussion around grid transformation included:

- *The opportunity to reconsider the hierarchical structure of energy distribution and policy in light of the pressing need for an efficient decentralized model;*
- *The need for deliberate distribution planning to make cost-effective investments that are fair to all ratepayers, especially marginalized communities; and*
- *The importance of increasing the visibility of data obtained by major utilities to encourage community planning.*

Grid transformation implies a shift from hierarchy to automation in the flow of energy to and from consumers. This requires smart technology that will change the entire architecture of the distribution system to create a fluid and dynamic flow of energy. This immense transition could be eased by adding the potential for customers to autonomously adopt behind-the-meter facilities as an alternative to relying completely on grid power. This could incentivize and accelerate the process of decarbonization by allowing customers to adopt and install distributed power on-site.

Grid transformation affects not only the flow of energy but calls into question who will provide the necessary solutions, who will own them, and how providers will be compensated. Participants referenced the need for greater integration between energy system planning and local government planning, with influence in both directions. This will help ensure that the needs of individual localities are being considered and that changers are fair to all ratepayers. A hosting capacity analysis at the distribution grid level could help identify where there may be issues for distributed solar. This, along with consulting localities on their goals related to electricity demand (such as plans for electric bus fleets), will generate insight into where to place distributed solar and where to incentivize it. Participants opened dialogue around a need to transform the role of utilities as distribution becomes less centralized and less “utility owned.” This will require a change in compensation methods as well. The centralized model of the current grid will need to be decentralized and give way to a competitive arena where third parties play a larger role in driving innovation and utility investment no longer monopolizes the energy economy. This diversification has the potential to both accelerate grid modernization and benefit ratepayers with cost savings.

Participants were asked to consider the *technical* opportunities and challenges of running a distributed smart grid, related to resource management and the use of information technology.

A significant technical challenge for developing a new grid is the lack of data transparency from the state's major utilities, Dominion and Appalachian Power. Visibility into their systems is important for developing plans that clearly lay out benefits to consumers. It is important to have a full understanding of the production profile (daily and seasonally), as well as the load profile as Virginia's grid evolves to be able to identify gaps. Additionally, the Virginia Clean Economy Act includes some broadband provisions, which will need to be developed further as the rural broadband infrastructure is necessary when transitioning to a smart grid.

The realities of grid transformation entail not only massive change in the flow of energy, but also call into question who will provide the necessary solutions, who will own them, and how providers will be compensated. Participants referenced the need for greater integration between energy system planning and local government planning, with influence in both directions. This will help ensure that the needs of individual localities are being considered and that changers lead to fair outcomes for all ratepayers. A hosting capacity analysis at the distribution grid level could help identify where there may be issues for distributed solar. This, along with consulting localities on their goals related to electricity demand (such as plans for electric bus fleets), would generate insight into where to place distributed solar and where to incentivize it. The centralized model of the current grid will need to be decentralized and give way to a competitive arena through third parties rather than utility investment.

Participants identified three key policy opportunities that would grid decentralization:

- A statewide program that reaches out to all local governments to enable them to do local energy planning while also requiring distribution utilities to collaborate at the local level to determine resilience and decarbonization priorities, with a strong focus on environmental justice.
- A requirement for greater transparency by distribution utilities so they have to facilitate interconnection of local resources, especially at the community level and with local government projects.
- The possible modification of a Virginia municipal aggregation statute that could be tweaked to support community choice aggregation. If localities did not have to obtain permission from the Virginia State Corporation Commission (SCC), they could choose to aggregate. However, this opportunity presents a potential challenge faced by other states that have adopted community choice aggregation, such as California. California deals with the cost of non-participating rate payers through the use of exit fees. The structure is volatile, hard to predict from year to year, and thus acts as an impediment for community choice aggregators. This would be important to consider carefully if Virginia were to moves in that direction.

Participants were asked to consider policies and actions that would create an equitable smart grid that might benefit all Virginians. In transitioning to a non-hierarchical model of energy distribution, it is important to center historically disadvantaged communities. More frequent, extensive, and inclusive community engagement should be undertaken prior to implementation

of changes in order to ensure that burdens and benefits are equitably shared across the Commonwealth. Participants also highlighted significant workforce development opportunities that Virginia's future smart grid will generate, and they expressed the opinion that these opportunities should in particular benefit lower income communities.

Advancing Development of the Transportation Sector

Key themes of discussion around transportation included:

- *Creating incentives for used and new electric vehicle purchases;*
- *Adopting a ridership-based funding model for public transit; and*
- *Providing alternatives to driving through the expansion of broadband, rideshares, and reliable public transport.*

Participants assigned to the transportation breakout group focused largely on issues of equity and the need for expanded economic impact analysis in order to better plan for a transportation system reliant on clean energy. One of the equity issues addressed was the existing "new technology incentives." These incentives primarily benefit Virginians who can afford new electric vehicles, placing the burden of older, carbon emitting vehicles on more economically distressed populations. The group also discussed the potential in changing the funding model for publicly funded transit to a ridership-based model, especially in urban areas where riders who are reliant on public transit are predominantly lower income. There are significant opportunities for reducing the carbon emissions of the transportation sector by incorporating auto-free or limited access zones, increasing walkability in communities, and investing in ride shares or van pools.

The electrification of transportation offers the potential for numerous ancillary benefits, including air quality improvements, GHG reductions, grid load leveling, and increased capacity utilization. Recognizing this opportunity, the Virginia Department of Environmental Quality has committed to investing $14 million over the next three years towards electric vehicle re-charging. In discussing the increase of vehicle electrification, participants identified several gaps that need to be addressed to ensure the realization of benefits for all Virginians. The highway use fee for electric vehicles in Virginia is high ($88.20/year), and it is also one of the nation's only efficient vehicle fees. In order to gain public support for a clean energy model, it is important to increase incentives for consumer investment by considering reducing or eliminating this fee. This could also be accomplished by creating a purchase incentive for used electric vehicles, which has the potential to benefit economically disadvantaged communities. Another barrier that needs to be considered is demand charges and the related issue of anticipating the fuel cost at peak demand. This is especially relevant when transitioning to an electric bus fleet, which is extremely costly and will escort a high demand of energy in the hours it is not operating.

Participants discussed alternative avenues that Virginia should consider in order to support investment in clean fuel technologies for transportation and other applications. Suggestions included sequestering other greenhouse gases for fuel, shifting to biodiesel (provided there is standardization of the quality of biodiesel and the supply chain is stable), and taxing off-road diesel equipment to provide greater incentive for alternatives. A barrier identified was the current state and federal regulation on the "useful life" definition of diesel vehicles. A potential way to overcome this challenge is to create incentives for the early retirement of diesel vehicles.

Programs and policies that consider the needs of historically disadvantaged communities are necessary for the development of an equitable decarbonized transportation system. Currently, 60% of Virginians do not have access to an electric outlet for charging within 20 feet from where they park. Virginia needs to focus on expanding smart grid infrastructure in underserved communities, creating higher incentives for lower income consumers to make electric vehicle purchases, and extending incentives to apply to used electric cars as well as new ones. It is also necessary to acknowledge the inequities in the broadband infrastructure as well as to invest in telework and education policies that could reduce the need for transit.

Advancing Development of Buildings + Distributed Solar Sector

Key themes of discussion around the buildings sector, also featuring discussion of distributed solar, included:

- *The need for updated building codes to allow for energy efficient upgrades;*
- *The need to expand education on benefits of solar and new building regulations to consumers; and*
- *The need to consider policy that addresses energy efficient buildings in lower income and renter communities.*

Participants identified the need for improving building codes as a key element in advancing the development of energy efficient buildings. In order to reach the 2050 decarbonization goals, policymakers need to take action to address lower-performing buildings by creating legislation that allows for performance contracting, a financing tool for public and commercial renovations. Another tool for Virginia to consider adopting is Commercial Property Assessed Clean Energy (CPACE) financing, which helps commercial building owners pay for energy efficient upgrades by providing 100% financing and long-term repayment options on eligible projects. Exploring statewide financing programs and educating building owners on the importance of clean energy would aid in the transition to more energy efficient buildings.

Scaling up distributed and community solar and storage will be an increasingly important focus of overall efforts to increase building efficiency. Participants highlighted the general lack of understanding and widespread public misinformation on the costs of solar as a significant

barrier to advancing this sector. Reframing the cost of solar as well as reinforcing facts about its benefits, alongside updated building regulations, could encourage consumers to adopt energy efficiency strategies and renewable technologies in their own households and businesses. Solar programs in schools has been a good model to increase traction and publicity, sending positive messaging about the benefits to taxpayers. Extending this model to other sectors could enhance community adoption as distributed solar is highlighted as a key resource for community resiliency. As distributed solar becomes more widespread and affordable, it is crucial to create public policy that focuses on historically disadvantaged communities.

Conclusion

Overall, participants in all four breakout groups expressed a need for state and local level policy coordination to advance the decarbonization of Virginia's economy by 2050. Engaging with localities and giving communities agency in the decision-making process will be vital to propel these initiatives forward. This conversation was a preliminary step in the Energy Transition Initiative's efforts to provide the Commonwealth with current economic modeling, policy analysis, and stakeholder engagement. Participant feedback on the modeling pointed towards an opportunity to include a more in-depth costs analysis tools that would empower communities to better understand the costs and investment opportunities that particular scenarios might offer. As Virginia proceeds with research, planning, and action for decarbonization, it is critical that we do more to convene genuinely inclusive dialogues that center lower income communities, rural communities, and communities of color. The Energy Transition Initiative at the Weldon Cooper Center for Public Service looks forward to continued research, analysis, and dialogue on these and other important topics around Virginia's clean energy economy.

Appendix One: Participant List

Utility Solar

Eldon James, American Planning Association (VA Chapter); Rappahannock River Basin Commission
Rene Hypes, Dept. of Conservation and Recreation
Carrie Hearne, DMME
Molly Parker, Dominion Energy
Nick Kasza, National League of Cities
Robert Crockett, Rural Solar Development Coalition
Ben Saunders, sPower
Rob Corradi, Sun Tribe Solar
Joe Lerch, Virginia Association of Counties
Ronald Meyers, Virginia Tech Dept of Fish and Wildlife Conservation
Judy Dunscomb, The Nature Conservancy

Grid Transformation

Astrid Atkinson, Camus Energy
Andrew Place, Clean Air Task Force
Lorenzo Kristov, Independent Consultant
Erik Rison, Virginia Chamber of Commerce
Damian Pitt, Virginia Commonwealth University
Cliona Robb, Thompson McMullan
Wafa May Elamin, Virginia Energy Workforce Consortium
Lesley Jantarasami, Bipartisan Policy Center
Larry Corkey, DMME
Nam Nguyen, DMME

Transportation

James Bradbury, Georgetown Climate Center
Julie Timm, GRTC Transit System
Becca White, UVA Dept of Parking & Transportation
Robin Jones, DMME
Alleyn Harned, Virginia Clean Cities Coalition at JMU
Trip Pollard, Southern Environmental Law Center
Scott Novak, Georgetown Climate Center

Buildings + Distributed Solar

Michael Ryan, Camus Energy
Al Christopher, DMME
Ivy Main, Sierra Club and PowerforthepeoplVA.com
Bill Penniman, Siera Club
Karla Loeb, Sigora Solar
Bill Greenleaf, Virginia Community Capital
Chelsea Harnish, Virginia Energy Efficiency Council
Phoebe Crisman, UVA Global Environments + Sustainability Program

Appendix Two: Workshop Agenda

Decarbonizing Virginia's Economy: Pathways to 2050

AGENDA

October 30, 2020

1pm-4pm

12:45pm	**Early Tech Start** *Please check that your full name is listed on Zoom*
1:00pm	**Welcome + Overview** *Kristina Weaver, Institute for Engagement & Negotiation*
1:10pm	**Presentation on Current VA Energy Economy Modeling** *Bill Shobe, Energy Transition Initiative*
1:50pm	**Orientation to Breakout Group Process**
1:55pm	**Quick Break: *Return by 2pm*!** *You will return to your pre-assigned Breakout Group*
2:00pm	**Breakout Groups** *Utility Solar* *Grid Transformation* *Buildings + Distributed Solar* *Transportation*
3:15pm	**Debrief + Discussion**
3:35pm	**Where Do We Go from Here?** *Quick Breakout in Pairs*
3:55pm	**Thank you & Adjourn**

Thank you to our sponsors and partners for making this workshop possible!

Appendix Three: Notes from Workshop & Breakout Groups Organized by Topic

Notes on Q&A with Bill Shobe on Virginia Energy Economy Modeling

Q: Are you able to list the elements of the transportation segments? Trucking? Commuter Miles? Air Travel? Rail Travel? Public Transportation? Sea-going shipping? Others?

- A: Not detailed right now, the model as it stands is fairly aggregated. Some sectors of transport. Is broken out (light duty vehicles and big trucks). Can't report in detail of how those are treated in the model. Model will expand.

Q: Why does the model assume no change in settlement patterns? Was that just a modeling limitation, or was it based on an assumption that such patterns truly will not change?

- A: The model avoids an "optimistic scenario." We want a scenario that accomplishes decarbonization without super ambitious changes in social organization (i.e. commuting in cities). Didn't want to assume large changes in commuting because changing that in a significant way by 2050 will be hard. Model wants to assume we can do it without, so it won't be stalled. Pricing of carbon emission in transportation will work in that direction, but it takes time. Wanted to avoid that assumption in the modeling to see if it was accomplishable without changes in settlement patterns, which it is.

Q: What is it worth to be able to reduce friction in utility scale PV siting? To double it?

- There is a sense in which that only changes the cost. Model limits utility scale. Solar has gotten so cheap that a cost minimization model always chooses to max utility scale solar. If it wasn't constrained, the model would expand solar to take up 2% of the land area, which WCC found to be an overly aggressive assumption to make in terms of changing VA land use by 2050. Removing frictions would lower the cost, not necessarily the amount of solar.

Q: How do we pay for this?

- If CO2 emissions are going to be limited, we will have to change behavior. What effect does this have on total consumer expenditures? The answer: WCC isn't in a position to fully report on economic side of the story, their research is focused on resource modeling. Next step is on rates and expenditures. Especially as there is so much Energy Efficiency gain, especially in transportation from electrification, there are substantial gains in the amount of energy people use even though there is an increase in the rate paid per kilowatt hour. Some of the resources they will be building will be very inexpensive. However, to lean heavily on offshore wind, we are going to have to use tech. That is currently very expensive, expect this to fall as technology grows. Other gains: health improvements from less combustion of fossil fuels, we will be generating our own resources vs. importing them, because it's cheaper. Cost combined with gains is a sensible investment in the state.

Q: What assumptions does the model make about VMT (vehicle miles travelled) levels?

- Not assuming big changes in VMT because they didn't want to assume that we could drastically change settlement patterns by 2050 in order to get to decarbonization. Wanted to model without these assumptions to show it is possible regardless. If settlement patterns shift or public transport increases/electrifies this will only make decarbonization easier to achieve.

Q: What does this Virginia-level modeling look like compared to other state-level modeling you've seen? What are the opportunities for Virginia w/r/t getting ahead of other states in decarbonizing?

- If we set the goal to decarbonize the entire economy, it would put us in the lead. Other states have enunciated goals along these lines, mostly committing to 80% of the economy decarbonized by 2050 (ie NJ). Four pillars of decarbonization laid out in model are the same for any state trying to decarbonize. They are common themes in all the states running decarbonization models.

Q: What assumptions about participation in PJM (regional electricity grid operator in the northeastern US) markets?

- Assumption is that it would be a part of PJM, as long as the rest of PJM would be decarbonizing as well, or else we would just be importing carbon free fuels that other states could generate and then they would use coal. Didn't want modeling to rely too heavily on imports. If we invested more in transmission infrastructure, we could choose to import more electricity from other states. Part of modeling exercise was to determine what VA could do, in a cost effective way, without relying too much on imports.

Q: Does the VCEA component of the model assume that all the solar, wind and storage categorized as in the public interest has to be built? This has been a source of debate in the recent IRP hearing.

- Yes

Q: Does the model incorporate any of the elements of the scenarios identified in Dominion's draft IRP?

- No, WCC took a fresh approach without the planning of regulated utilities

Q: Does the model take into account reliability and resiliency?

- Yes. Model has a fine-grained model of weather patterns (i.e winter when there is lower supply of renewables, or in the summer when demand is high, but wind energy supply is lower or sun isn't shining as much). Model took these expectations into account. It also highlights the importance of having firm non-emitting power (currently provided by nuclear).

Q: Burning biomass has significant PM2.5 and other pollution levels even if one assumes that CO2 may be recaptured over time. What assumptions or thoughts did you have on those issues?

- Assumption is that CCS will limit the combustion byproducts. Not sure what specific emission control assumptions are made in the model. Combustion is a small fraction of the energy supply in this model, solar and wind by and large, which will greatly reduce emissions. Reducing fuel combustion will have immense health benefits for the population.

Q: Solar is getting exponentially more efficient. The same size panels are generating more electricity than they were even a year ago. Those efficiencies are going to get better and better. Did you take efficiencies in solar technology into account re: land use?

- No. Model is conservative in assuming the same footprint of solar technology over the years. If solar panel technology improves efficiency by 10%, that will result in significant savings.

Q: Does the model account for constraints on transmission?

- Yes, transmission is in the model. No infrastructure for transmission was built in the models.

Q: Did you take into account FERC Order 2222?

- FERC Order 2222 was issued well into the modeling process. Also, the model does not get into the details of control and ownership of distributed resources, which is the subject of FERC 2222.

Q: Can carbon sequestration happen organically through our forests and agricultural practices at the scale needed for that component of the model?

- Yes. We have significant potential for green carbon sequestration. Not assuming a large contribution from biological sequestration in this model, but that is an option that will provide wiggle room down the line.

Utility Solar Breakout Group Notes

Question 1: Under each of the scenarios presented in the modeling, utility scale solar must expand quickly to meet Virginia's net zero carbon goal. The amount of land that will be needed, even under the constrained model of 0.5%, is significant. The volume of new utility solar is going to force grid transformation challenges and solutions. Reflecting on the additional context and considerations that Jonah provided: What are your reactions to the constraints and assumptions used in the model and the volume of land that will be needed? Do you have any thoughts on the pace and timing of the needed development?

Needs

- Early connectivity with local government is key because planning decisions are local and would benefit pace to approval.

Opportunities

- The Nature Conservancy is looking at what amount of land is theoretically suitable, and overlaying that with theoretical opportunities for degraded land. Identifying where conflicts emerge with conservation and cultural/ag conservation priorities. Model takes into account proximity to transmission and land slope.
    - TNC is also nearly finished with a very simple model to identify areas suitable for solar development. We are overlaying that model with Conserve VA to indicate conflicts with other uses and assessing available disturbed lands layers to evaluate the potential for low impacts solar development.

Challenges

- 1% sounds okay in theory – but the process for land use decisions is at the local level, following local codes, etc. The reality on the ground includes neighbors' inputs, impacts on local economy, etc.

Ideas

- Avoid/offset impacts to prime lands by maximizing implementation on brownfields and previously disturbed lands
- Decrease solar PV intensity on site to allow dual-use agricultural purposes, etc. Take a social science approach to having multiple land uses for utility scale solar PV that communities will embrace.
- Suggest reaching out to DEQ about the accuracy of the 1% cap for land use in modeling to obtain current acreage numbers for permitted solar development to date. https://www.deq.virginia.gov/Programs/RenewableEnergy/RenewableEnergyProjectsNoticesofIntent.aspx

Question 2: We want to focus on the issue of land use policy and regulation. **Do you have any concerns about the current policy framework in terms of the role of local governments and the State?** How might those concerns be addressed? As a related question, **if you could propose one change in policy that would have the greatest impact in scaling up solar, what**

would it be? You might consider issues related to incentivizing development, permitting, and enforcement.

Needs

- Greater support to local governments to obtain the information they need and support for meaningful public engagement.
- To increase the speed of scaling up solar development, very clear roles and responsibilities and transparent, clear, and concise policies, procedures, and processes should be defined for both local governments and the state.
- Solar development specific E&S and Stormwater regulations
- Need to understand and discuss decommissioning and bonding for these large utility-scale solar projects.

Opportunities

- NY and other states are starting to consider state permitting offices. I don't know if Virginia should follow those models, but they're starting to emerge in places like NY.
    - Office of Renewable Energy Siting (NYSERDA)

Challenges

- Unlikely to be able to mitigate the habitat losses: how do we do this? We need to look at the policy around mitigation to ensure mitigation is actually possible, that it is equitable, and that it achieves high quality results

Ideas

- **Policies could be used to incentivize more development:**
    - Raise the target amount of solar development that happens on previously disturbed lands. Right now, carve out in Dominion for 200 MW on previously disturbed land. Unclear how this was reached, not sure whether it's appropriate. Explore this number more to incentivize greater development.
    - Financial incentives - encouraging development on abandoned mines, brownfields, parking lots, etc.
- Policy to establish unambiguous, transparent, and effective compensatory mitigation for habitat/resource loss, which is bound to occur.

Question 3: The energy system we are shifting away from has been characterized by gross inequities, such as the siting of extraction and power generation facilities in proximity to communities. The Virginia Clean Economy Act is clear that this energy transition shall be planned with consideration to equity for historically disadvantaged communities. Building on the issues that have been discussed already, **what are additional key challenges and opportunities related to how solar expansion in Virginia could be accomplished most equitably for all Virginians?** You might consider issues related to economic opportunity, energy costs, and any opportunities to redress past harms.

Needs

- More and Better inclusion needs to happen

- TNC has been doing outreach to EJ groups, but nobody on this call represents that group, so we need to be sure to reach out to these groups to hear their concerns, so they are included in the conversation. (i.e. New VA Majority, Environmental Justice Collaborative (Council on Environmental Justice), Black Family Land Trust, Southeast Rural Community Assistance Project)
- Need more outreach to these groups, and also to rural communities, as they are typically not able to have a voice in the way needed

Opportunities

- Table needs to be brought to the community, not invite them to a table that has been set (Can we work with disadvantaged farmers to enable them to use solar to benefit from the expansion, financially?)
- Dominion Energy is doing screens on new projects for EJ, and works to get conversations going with these localities
- Maps on capacity from Dominion may be helpful to localities to get ahead of the game in preparing for the siting agreements.

Challenges

- Big question regarding the extent to which utility scale development actually benefits surrounding community. Jobs creation may not materialize
- Experience from coal country in SW VA, utility scale is considered a more extractive industry. While there are opportunities for job growth, there are still issues - transportation, addiction (are people hirable), barriers to entry into the workforce; so if workforce isn't local, jobs are temporary, etc. then if there's a meter attached to what the community receives, they will be more receptive to this
- Localities are feeling "flat-footed" when individual property owners sign agreements, when the approval process hasn't even gone forward. Property owners expect benefits but may not be realized because the individual agreements are premature.
- Need to be careful with utility-scale solar projects to make sure that the historic and significant agricultural and forestry (VA's largest economic force) is not unduly impacted by growth of solar.

Ideas

- Maps on capacity from Dominion may be helpful to localities to get ahead of the game in preparing for the siting agreements.
- Siting agreements that take into account individual locality needs, ability to get to yes is enhanced. Better to have flexibility, not to have constraints of creating uniform requirements for industry. Needs are very different from county to county, and uniform requirements would actually be a setback.
- Build in benefits for community to agreements, such as those built into three siting agreements reached to date: focus on development of broadband, e-services in unserved areas. Enable localities to get benefits that can't be obtained any other way.

Question 4: Consider what interactions and overlap you see between our conversations and the other areas that are meeting right now (buildings + distributed solar, grid transformation, transportation). Given those areas of convergence, do you have any insights or suggestions that would improve the adoption of solar?

Needs

- Grid modernization should be focused on low conflict areas for solar development.

Opportunities

- Funding: Structure a Green Bank to help fund more resiliency projects such as Microgrids, and other LMI programs

Challenges

- The reason TNC is doing the modeling work is because we are concerned about the impact of solar development on natural resources, particularly large patches of intact forest that are important for conservation of biological diversity in the face of climate change. Siting of the facilities to avoid impacts to resources is key for sustainable development.
- Storage issues: we just don't know enough about the storage element of this, what will be needed by localities or for localities
- How do you bring ODP, co-ops and municipalities into the same type of strategic planning that Dominion/APCo is doing through the VCEA?

Ideas

- Integrate permitting of solar + storage (right now it's a separate process at the utility scale size, with storage needing to go through the SCC even if it could otherwise get a PBR with DEQ
- Net-metering: Remove the caps for net metering and create a solar specific robust S-REC market: These are decisions that are best made at the local level
- State code allows for agricultural operations to do 1.5 MW at 150% of load; don't know if any have taken advantage of this. Have localities used comp plans to take advantage of this?
- For parking lots, allowing solar carports as by-right uses or encouraging in some other way to complement vehicle electrification - Rooftop solar is already "by-right" per state code

Grid Transformation Breakout Group Notes

<u>Question 1:</u> We know that we could easily spend all of our breakout time detailing the technical issues around this topic, but let's stay at a high level for now. Reflecting on the issues as Art has just laid them out, have we gotten it "about right"? does anyone find anything truly off base about how we're characterizing the challenge? Are there glaring

omissions or issues you'd characterize very differently? We want to capture those if so, and to move on quickly to other strategic questions if there is board agreement about how we've framed the issue.

Needs

- There is a need for distribution planning. The analysis has been approved to occur but hasn't happened yet.
- Environmental Justice aspect -- ensuring strong focus on this because there are already vulnerable communities who are just now hearing about these opportunities - important in considering rates, distribution level -- geography & demographics must be considered
    - Potential for regression - very careful about electrification and who has access to the latest tech options (that are not inexpensive) - rate question + participatory nature
- There is a need for collaboration between state and local governments. There is little collaboration in energy planning between the two entities.
    - Public/private partnerships with large energy users should also be considered. There is an opportunity to include them in this new regulatory environment.

Opportunities

- Focus on resiliency - is there any provision in VA for micro-grids or other forms of grid resilience? No, micro-grids are not a focus yet.

Challenges

- To move from hierarchy to automation we need much more real time automated decision making with intelligent devices -- auto switching, reversing flow, setting up system protection differently. Entire architecture of the distribution system has to change as well to create a truly fluid and dynamic flow. Multi-directional flow is critical.

Ideas

- Add the potential for customers to autonomously adopt behind the meter facilities as an alternative to relying completely on grid power. We can plan and send incentives for the system but could also see great acceleration of customers simply adopting and installing on site. adopting and installing on-site. Important ingredient in trends of change
    - Upcoming DMME webinar gets into incentivization at customer premises + net metering (following the VCEA). Part of the VA Clean Economy Act does encourage distributed generation on the customer side of the meter.
- Factoring in incentives for customer side flexibility including rate structures & technical integration at the distribution level
- Ensure programs around net metering, etc. expand to community focus and access for multi-family households to solar (beyond single suburban family housing units)

<u>Question 2</u>: What are the *technical* opportunities and challenges of running a distributed smart grid? Consider both the management of distributed energy resources and the use of information technology to accomplish this.

Needs

- There is a need for very deliberate distribution planning. When we do make investments, we should be fair to all ratepayers (and in particular, low income customers). We want rates to be competitive. Investments made should be cost-effective and also the best from a grid management perspective.
- We need to have a full understanding of the production profile (daily and seasonally) as well as the load profile as we evolve; need to be able to see where there are gaps.
- We need to transform the role of utilities as distribution becomes less centralized and less utility-owned; compensation methods will have to change as well.
- Rural broadband infrastructure - very important to smart grid

Opportunities

- Encourage utilities to have comprehensive visibility into their grids. Money is wasted unless those investments are targeted.
- Southern Environmental Law Center (SELC) is focused on making sure it's fair to ratepayers **and** advancing environmental interests. They have an interesting perspective on whether an investment is a worthwhile spend.
- As we are introducing new technologies in VA, bringing in Workforce lens there will be many training needs and we should begin to identify transferable skills that can move across the energy sources.
- There are some broadband provisions in the VCEA + electric coops are getting into it. Not where we need to be but beginning to happen

Challenges

- Currently VCEA focuses on two major utilities, Dominion and Appalachian Power, but does not cover all utilities (coops, municipal)
- Technical challenge of using data -- Importance of utilities having visibility deep into their systems: Dominion's proposal on smart meters was rejected by the SCC on the grounds that it was not sufficiently well supported with a plan for how consumers would benefit. We're asking them to deal with highly granular data in great volumes and to be able to use it in decision-making in a way that is new for them. This is a major challenge for this new grid that we're considering.

Ideas

- Changing incentive structures
- Need to ensure policy making extends outward to the edge at the coop/municipal level to ensure changes are fair to people

<u>Question 3</u>: Who will provide the solutions and who will own them, and how do we compensate those providers?

Needs

- Ramping up storage

- Need much greater integration between energy system planning + local govt planning with influence in both directions

Opportunities

- State role in having dialogue between localities and utility planning. Utility commission in VA is recognized as high caliber with top expertise - take advantage of them! You get more of a level playing field and debate in front of the Commission as opposed to the General Assembly. To whatever extent we can lean on them to make technical decisions, that puts us in a better place

Challenges

- Policy question: Who is going to own facilities? Do you want private investment or have utilities do most of it and rate base most of it. Two big risks are performance and obsolescence. We want to have competitive arena through third parties rather than utility investment. The more that you can create a commercial marketplace where it is the 3rd parties who are investing in the facilities and technologies, that's better for rate-payers.

Ideas

- Hosting capacity analysis down to the distribution grid level and identifying places where there may be issues for distributed solar. Role for planning to generate insight into where to place distributed solar and where to incentivize it.
    - Localities might have their own goals that could affect electricity demand (such as plans for electric bus fleets).

<u>Question 4</u>: What *policy changes* do we need in Virginia in order to transition to a grid with a variety of distributed energy resources?

The energy system we are shifting away from has been characterized by gross inequities, and the Virginia Clean Economy Act is clear that this energy transition shall be planned with consideration to equity for historically disadvantaged communities. How can the future smart grid better serve all Virginians? What specific programs and policies would support this?

Needs

- Applying more of a community approach for historically disadvantaged communities - implementing more required feedback and inclusion efforts prior to development. Keeping community feedback at the forefront.
- We have embedded in our political mentality a top down notion of where policy and change come from, which aligns with hierarchy of power grid. Not generally suited to bottom up solutions. Two key policy changes needed:
    - Statewide program that reaches out to all local governments to enable them to do local energy planning and requires distribution utility to be a collaborator at the local level to determine resilience and decarbonization priorities. With strong EJ theme to it. But may need state support, guidelines, technical expertise
    - Open up the distribution utility so they have to facilitate interconnection of local resources, especially community level and local government projects. Analogy to

what FERC did in the 1990s to create open access transmission - need this for open access distribution with 3rd party developers

-

Opportunities

Localities working with Utilities: When we scale it up there is a regional level focus in working with planning district commissions (PDCs) that would be an appropriate forum for big-picture energy planning (shaping energy demand).

- Case in point – the RVA Green planning group is working on 5, 10 year plans. Having guidance within these smaller timeframes would be beneficial for regional and local planning efforts to complement statewide initiatives.

VA has municipal aggregation statute that could be modified to support community choice aggregation - possible opportunity. If localities were freed up from having to get the blessing of the SCC they could aggregate if they thought it made sense.

- Would it be possible to create a financial structure to remove the risk? Yes - presumably if you could reduce impact on utilities. It would be difficult to accomplish this change politically.
- At present, the SCC has only authorized Reynolds to aggregate loads, all others have been denied. Most denials have been based very slight rate increases being interpreted as having negative implications for existing rate-payers (viewed as a reaction to the SCC's frustration with rates being increased so frequently).

Rate modernization + decoupling throughput - visioning the world ahead of us. Sell services not electrons

- Sending price signals to consumers to incentivize
- Opportunity to get under the wire of the existing law if you can restructure the financials.

Challenges

- In CA there is community choice aggregation and the way they deal with the cost of non-participating rate payers is through the use of exit fees. The structure is volatile and hard to predict from year to year and is an impediment for community choice aggregators. This would be important to consider carefully if VA moves in that direction.

Ideas

- Seen recently at SCC suggestions that utility procurement is very siloed and should consider moving towards all source procurement (e.g. when upgrading transmission line, you'd state the problem more directly and allow more competition)
- Community approach could also include ownership of local resources at the neighborhood level (e.g. comm based organization or neighborhood association owns resources).
- Statewide Program idea: Huge chunk of this could be targeted at key municipalities in VA; we could get far even without all localities involved

Transportation Breakout Group Notes

<u>Question 1</u>: Building on the issues that Anthony laid out, what are additional key challenges and opportunities related to the transformation of the Transportation Industry in Virginia? Please include issues related to economic and racial justice and equity.

- Needs
  - Need for an expanded economic impact analysis
  - Cybersecurity of the grid needs to be looked at and distributed grid should be explored
  - Funding models that are based on ridership for publicly funded transit
  - Federal highway dollar allocation, important that there be processes in place that underserved communities have a voice in how funds are distributed
- Challenges
  - Issues of Equity
    - New technology incentives only benefit those who can afford it. Communities who are more economically distressed take on the burden of carbon emitting older model vehicles.
    - Low income Americans spend 30% of income, 75% of consumer energy purchase - these are areas where decarbonization needs to constantly plan to benefit these households' investments
  - Current rate of vehicles would add a significant number of batteries to the waste/recycle that needs to be addressed.
- Opportunities
  - Important to consider alternate forms of transit in the modeling in terms of its ability reduce vehicle miles travelled (VMT) and provide other benefits to community
  - Georgetown Climate Center is currently conducting a study with Greenlink to evaluate several low-carbon transportation policy scenarios, including costs and benefits from a range of perspectives. Results will be available in December 2020.
  - TCI (and partners) have conducted analysis and developed tools to evaluate the costs and benefits of a cap and invest program for the region, including VA. (<u>https://www.transportationandclimate.org/modeling-methods-and-results</u>)
- Ideas
  - Shift funding of public transport model to ridership models- i.e. ridership during COVID didn't drop in RVA since most riders are lower income -need additional investment
  - Reduce barriers to transit use-make that the economic incentive-rideshare---also related to other economic issues--attack the economics on other issues--investment
  - Auto-free zones with limited access
  - Consider Transit - walkable and transit - to incorporate into model

- Consider how we incentivize and reduce barriers to people getting on transit and out of carbon emitting cars, ride shares, van pools
  - Change language from 'cost' to 'investment'
- Transit vehicles have long useful lives (20-40 yrs) - long time to replace or convert a fleet, don't replace the whole fleet at once
- Consider pedestrian zones/experiment with auto free/limited access zones

Question 2: Electrification of transportation offers the potential for numerous benefits, including air quality improvements, GHG reductions, grid load leveling, and increased capacity utilization. What efforts are underway to realize those benefits? What gaps still exist in Virginia's policies and programs that would accelerate transport electrification and ensure realization of those benefits?

- Needs
  - More Grid initiatives + vehicle to grid idea: Dominion electric bus pilot is one, but gap still exists so we need to diversify incentives
  - Smart Grid investments to develop time of use initiatives
- Challenges
  - Demand charges--fuel cost at peak demand is an issue and important barrier
  - Charging public transport fleets in the few hours they are not operating
  - Lack the funds for electric bus fleet purchases
- Opportunities
  - $14 million over the next three years going to electric vehicle re-charging https://www.deq.virginia.gov/Programs/Air/VWMitigation.aspx
  - Another $15M for transit in three pilot localities: Blacksburg, Hampton Roads, Alexandria.
- Ideas
  - Suggestion: Virginia has a high electric vehicle fee and nation's only efficient vehicle fee.
  - Open grant for clean air communities-heavy duty vehicles ($20mm)
  - VA should work towards a used Electric Vehicle purchase incentive

Question 3: Battery powered electric vehicles are expected to be the most cost-effective technology for decarbonization of light-duty transportation such as cars, SUV's, and smaller trucks. Other technologies and clean energy sources, such as green hydrogen or sustainably produced biofuels, will likely be needed to fully decarbonize heavy duty transportation. What steps should Virginia consider to support investment in clean fuel technologies for transportation and other applications?

- Needs
  - Important to include other types of vehicles such as construction equipment or farm equipment

- Challenges
  - Federal and state regulations on defining 'useful lives' of diesel vehicles
- Opportunities
  - VA is spending $50 mm on EV Pilot technologies
  - Options include low carbon fuel standard such as renewable natural gas
- Ideas
  - Consider GHG sequestering fuels
  - Incentivize to get out of our gas car for individuals
  - Incentive to early retire diesel vehicles
  - requirement for when transit vehicles may be retired
  - Renewable diesel and propane as well through procurement processes
  - Biodiesel could replace diesel (provided there is standardization of the quality of biodiesel and the supply chain is stable) - Ethanol could be used for large gasoline vehicles.
  - Begin an emissions inventory-include transportation in the dialogue
  - VA doesn't tax off-road diesel fuel purchases - should do so to provide greater incentive alternatives

<u>Question 4</u>: The Virginia Clean Economy Act is clear that the transition to a clean electric grid shall be planned with consideration to equity for historically disadvantaged communities. How might the decarbonization of the transport sector be planned and implemented to reduce inequities in distribution of costs and benefits. What specific programs and policies would support development of a decarbonized transportation system that is also more equitable?

- Needs
  - Formal processes through which underserved and overburdened communities have a voice in responding to this question directly, on an ongoing basis.
- Challenges
  - 60% of Virginians don't have access to an electric outlet 20 feet from where they park for charging
  - Inequities in broadband system - and invest in telework education and policies
- Opportunities
  - Create assistance programs and incentives for LMI transportation energy savings which can create immediate returns for the community
  - Link affordable housing to transit and invest in both.
- Ideas
  - Provide $ for transit-reduced or free fares
  - Provide alternatives to driving-broader lens for equity-incentives for used EV
  - Higher incentives for lower income EV purchase (If incentive programs: more money for those who need it.)
  - EV incentives for used cars not just new vehicles

- Charge users for all the other costs of fuel-consuming vehicles-unified approach using disincentives and incentives

Buildings + Distributed Solar Breakout Group Notes

<u>Question 1:</u> Building on the issues that Arne laid out, what are additional key challenges and opportunities related to transformation of Virginia's Buildings Sector? Please include issues related to economic and racial justice and equity.

Needs

- Needs for increased ventilation in response to coronavirus can result in increased energy use, but also less need to work in these buildings due to teleworking.
- Education - sense that solar is expensive and difficult. Technology transfer problem in the residential sector.

Challenges

- Needs for increased ventilation in response to coronavirus can result in increased energy use, but also less need to work in these buildings due to teleworking.

Opportunities

- Opportunity to monetize the values associated with DSM, ancillary resources. Need to be prepared for transition and having the infrastructure in place to provide and aggregate resources. Multi-directional transition (top-down and bottom-up)

Ideas

- Resilience hubs - ways of using buildings to build resilience in communities by providing energy. Not captured by utility incentives and rates. Large potential effect.

<u>Question 2:</u> We want to focus on issues related to building codes and other drivers of building design and construction practices. What incentives and policy innovations would support greater adoption of energy efficiency and renewable solutions in new buildings?

Needs

- Change perspective on value in commercial markets - first-cost vs life cycle perspective, Lack of valuing Energy efficiency

Challenges

- Ethic for green building varies between different parts of VA. Profit-driven actors won't provide unless required or there is demand.
- Compliance with IECC can be a bigger issue than adoption. Compliance education of code officials and homebuilders is important, VA RGGI money - above-code affordable housing construction possible. Would like to see more widespread adoption

Opportunities

- Enabling legislation - Dillon Rule state- to allow mandatory commercial benchmarking by localities. Voluntary programs exist (outside of Dillon Rule purview?- yes because voluntary)

Ideas

- Rethink building codes, Slow implementation in VA work groups, adopt a statute like MD - IECC adopted by 2021, pre/re-wiring single and multifamily residential for new sources

<u>Question 3:</u> We want to focus on issues related to improving energy performance and increasing clean energy deployment in existing building stock. What incentives and policy innovations would support improved building energy management practices and building upgrades to energy efficient and clean energy technologies?

Needs

- Take action and address lower-performing buildings. Performance contracting - financing tool for public and commercial renovations. CPACE another commercial financing too- GA passed legislation to establish statewide program, Residential buildings reliance on utility investment. In electric cooperative territories, law passed that now allows the coops to provide on-bill tariff programs, which would allow customized upgrades to meet the needs of consumers.
- State leadership on educational side would be beneficial to the extent practicable. Need to improve understanding of clean energy to owners.

Challenges

- Building energy benchmarking can work well for existing buildings more so in commercial than residential. Building code training and enforcement. How do IECC-adopted states (i.e. MD) operate?

<u>Question 4:</u> We want to focus on distributed and community solar and storage as it relates to buildings. What specific programs and policies are needed to scale up these solutions?

Needs

- Reframing the costs of solar to the public
- Reinforce facts about the benefits of solar/energy efficient building regulations

Challenges

- General lack of understanding and widespread misinformation on costs of solar. Perception that bottom lines don't relate to interventions in energy systems
- Making sure utility companies don't raise rates, to kill the efficacy of solar adoption

Opportunities

- Expand Solar loans – currently predominantly sourced in Harrisonburg, Charlottesville, and Staunton

Ideas

- Solar on schools - good model with lots of traction and publicity. Good messaging about benefits to taxpayers and education. Should be emulated by other sectors, VCEA carve out for distributed solar - only in Dominion territory
- Resilience tool for use in communities. Adding solar storage in the community. Part of communicating its value
- Resilience hubs are useful in communities. Resilience hubs are an emergency preparedness tool which is part of communicating its value to a community.

<u>Question 5:</u> The current energy economy was shaped in a context of inequity, and the Virginia Clean Economy Act is clear that this energy transition shall be planned with consideration to equity for historically disadvantaged communities. How can the transition of Virginia's buildings sector benefit communities that have been historically harmed and excluded? What specific policies and programs would ensure this?

Needs

- 15% OF UTILITY SPENDING MUST GO TO LOW INCOME COMMUNITIES. Used to be 5%. RGGI dollars - 50 % to low income energy efficiency required
    - Less efficient, older buildings will more often accommodate low income people.

Challenges

- Public policy is needed: Before, Solar had greater upfront capital costs and was more limited. We're now in a position where we can focus on solar for LMI and minority communities
-

Opportunities

- DMME involved in programs - ESCO, focused on public buildings limited bandwidth. Very active in private market but DMME not involved. From Clean Economy Act
- RGGI money extended - DHCD money focused on new construction with a focus on small developers. LIHTC goes to large developers. DHCD Stakeholder outreach to begin next year