

The Energy Resilience and Efficiency Working Group Meeting Minutes

Tuesday, May 21, 2024, 9:00am-10:30am E.T.

Meeting Location: Online via Google Video

Attendees

Member Names	Affiliation	Present
Sen. Katie Fry Haster	Maryland Senate	X (designee)
Del. Lorig Charkoudian	Maryland House of Delegates	X
Andrew Place	Maryland Department of the Environment	X
Landron Fahrig	Maryland Energy Administration	X
Maurice Simpson Jr.	Constellation	X
Christine Csizmadia	Nuclear Energy Institute	
Carol Lane	X-Energy	
Jeff Shaw	SMECO	X
Nancy Sopko	US Wind	X
Mark Zucca	Potomac Edison	X

Non-members

Stephanie Vo, Cindy Osorto, Ben Hobbs, Tomas Tapia, Frederick Hoover, Christian Riordan, Kathleen Kennedy, Ziting Huang, Bridget O'Toole, Stephanie Wilcox, Mahdi Mehrdash, Boyu Yao, Haley Kotzker, Jared Deluccia, Chris Beck, Josey Schwartz

Introductions and Overview of MCCC and Working Group Charge

- Introductions were made by the members.
 - Andrew Place, Chair and Maryland Department of Environment designee
 - Jeff Shaw, SMECO, VP of Distributed Energy and Sustainability
 - Landon Fahrig, Maryland Energy Administration (MEA), Assistant Division Director for Energy Policy
 - Del. Lorig Charkoudian, serve on the Public Utilities Subcommittee
 - Mark Succa, Potomac Edison, a transmission and distribution utility in Western Maryland, engineer by education, currently work in regulatory affairs
 - Maurice Simpson, Senior Manager of State and Regulatory Affairs at Constellation Energy, working on clean & carbon free electricity. Constellation owns largest fleet of nuclear energy, including Calvert Cliffs
 - Bridget O'Toole, on behalf of Sen. Katie Fry Haster
 - Nancy Sopko, US Wind, Head of External Affairs, offshore wind developer based in Baltimore
- Maryland Commission on Climate Change Working Groups
 - Originally only four working groups, but MCCC added four new working groups due to the CSNA of 2022, including the Energy Resilience and Efficiency WG.
- EREWG
 - Meet every four weeks.
 - Intend to develop recommendations by August 13, 2024.
 - Charge is broad and not constrained: resiliency, battery storage, infrastructure improvements for energy, transmission.
 - Chair should not drive discussion around recommendations; it should be driven by members.

Overview of Maryland's Climate Pollution Reduction Plan

- Maryland Climate Policy History
 - 2008 Maryland Climate Action Plan led to the Greenhouse Gas Emission Reduction Act (GGRA) in 2009. MCCC codified into law in 2015. GGRA of 2016 signed into law based on MCCC recommendations. The Climate Solutions Now Act (CSNA) of 2022 set new statewide goals and expanded MCCC's role.
- [Climate Pollution Reduction Plan](#) (CPRP) released by MDE in December 2023.
 - Set new statewide goals and expanded MCCC's role.
- Plan provides pathways to achieve Maryland's climate goals of gross 60% reduction of emissions based on 2006 levels by 2031 and net-zero emissions by 2045.
 - Will create net economic benefits for MD.
 - Most ambitious climate goals of any US State.
- Includes 42 policies (current and planned)
 - Collaboration between agencies and sectors.
 - Pathways exist to achieve goals, but goals not possible with only current policies.
- Majority of emissions reductions will come from Electricity and Transportation sectors, but this is an economy-wide effort, so MD needs all sectors to participate.
- Maryland has come a long way over the decades
 - Maryland used to have the worst air quality in the eastern half of the US.
 - There were 8 coal fired power plants in 2006, but now MD only has two.
 - In 2022, Maryland met all national air quality standards since the Clean Air Act was enacted over 50 years ago.
- The greatest improvements have come from the electricity sector.

- o Looking at gas, coal and imported energy there have been significant emissions reductions since 2006 - two-thirds of statewide emissions reductions were from the electricity sector.
- o The Governor has a goal to reach 100% clean energy by 2035.
- o Across the country we are seeing efforts from businesses and government, but we also need individual investments to get us to our goals, such as investing in heat pumps and energy efficiency technologies.
- o Electrification is needed to achieve climate goals, relying on technologies like heat pumps, electric vehicles, and electric appliances that are powered by clean energy.
 - These technologies are becoming increasingly accessible and affordable, with federal and state incentives being available.
 - Electric cars are becoming more popular.
- o Can the grid handle it?
 - Some MD residents are concerned about grid safety and reliability.
 - A [2023 PSC study](#) found the grid can handle the anticipated load. Readiness will require grid investments, but it can be done affordably and reliably.
- Transportation emits the most of any sector in Maryland.
 - o Plan includes decarbonizing this sector across public and private vehicle fleets through electrification and by reducing vehicle miles traveled (VMT).
 - o Advanced Clean Cars II and Advanced Clean Trucks policies require new cars and trucks sold in MD to be ZEVs by certain years.
 - o MD's EV charging network is ready for more growth to support electric vehicles
 - MD is building a reliable charging network. Over 1500 public chargers have been installed in MD already.
 - Having access to charging stations is a concern for EV owners and will be addressed (i.e. range anxiety).
 - We are working to leverage both state and federal funding to increase investments into charging infrastructure.
 - Maryland Clean Energy Center (MCEC) has been investing in new clean energy infrastructure
- Building sector is driven by electrification
 - o Plan includes ambitious policies regarding buildings: Building Energy Performance Standards (BEPS). Over time, certain large buildings will need to decrease emissions and achieve net-zero emissions by 2040.
 - o Other policies include Zero-Emission Heating Equipment Standards (ZEHES) and Clean Heat Standards (CHS): the goal of these policies is to require appliances to be cleaner and work with laws and programs to decarbonize the building sector.
- What does this mean for the economy and workforce?
 - o The CPRP modeled the economic impacts, and found that it will have a net positive impact on the MD economy.
 - o 27,000 jobs will be created, including jobs for HVAC technicians, electricians, and contractors.
- Benefits will also reach individual consumers.
 - o The average MD household will be able to save \$2,600 which will increase over time. This means we'll be putting back money into Marylander's pockets.
 - o Low- to moderate-income (LMI) residents are spending less on utilities.
 - o MD wants to help households to afford these upgrades, so MD will pursue offering additional state incentives in addition to federal incentives.
- Incentive examples
 - o Home energy audits, solar panel incentives, rebates for heat pumps, appliance upgrades, electrical wiring, etc.

- o Driven by the IRA and IJJA - there are federal incentives to help with the transition.
 - o All of these will be available for LMI households.
- Potential funding sources - this is an important component.
 - o Plan includes some examples:
 - Federal grants and loans
 - Green revenue bonds
 - Cap and Invest or other carbon pricing models
 - o CPRP calls for \$1B per year in funding to reach goals.
 - Need for funding means MD will need creative solutions and leverage engagement from different sectors and agencies to achieve climate goals.
 - Need to heed Governor Moore's call to Leave No Marylander Behind.
- Call for this working group to lead on how to invest dollars in a responsible way.
- There are many economic benefits.
 - o \$1B price tag is large, but worth remembering that public health benefits, a cleaner environment, and healthier economy will be the result.
 - 27,000 new jobs
 - \$2.5B increase in person income
 - GDP increase by \$5.3B
- Health Benefits
 - o A core mission of MDE is public health.
 - o Benefits will be observed by all communities, but especially those that have been historically underserved; for example, there will be fewer asthma cases, increased life expectancy, fewer cancer cases, etc.
 - o A cleaner environment not only benefits public health, but also increases the opportunity for MD residents to enjoy outdoor recreation.
- Global benefits
 - o Maryland is small and just one state – but it is worth remembering that emissions reductions are not just local. Maryland is already a global leader and can set an example for other states and the world.
- Next Steps
 - o MDE will maximize federal funding opportunities, will launch regulatory priorities, continue to engage with the MCCC, and evaluate new funding mechanisms.
- Questions
 - o Andrew: On the funding side there is the EPA [Climate Pollution Reduction Grant Program \(CPRG\)](#), Maryland submitted into four buckets for the funding opportunity. There is a partnership with NJ, CT, DE and MD for heavy and medium duty truck charging, \$4M ask. MD will find out the decision in July.
 - Resiliency on public buildings \$33M for renewable power with backup battery generation. MD is part of this group that HI is leading.

Discussion of Study and Work Plan

- Work group members should offer perspectives on whether the study captures the statutory charge or if there are other considerations we should take into account.
- Dr. Ben Hobbs, professor of environmental management at Johns Hopkins University, is representing the JHU team who will provide analysis for the study.
 - o Ben teaches and does research in energy systems and policy.
 - o Has worked with MDE and is a member of the MCCC's Mitigation Working Group (MWG), as well as Co-Chair of AQCAC (Air Quality Control Advisory Council).
 - o Co-chairs California Market Surveillance Committee, which focuses on enabling California's market transition through technology and reform market rules.

- Other project members: Yury Dvorkin, Mahdi Mehrtash (led development of HOPE-MD tool), Ziting Huang, Stephanie Wilcox, Boyu Yao, and Tomas Tapia.
- Goal of study: Provided analysis to support recommendations and advice to the MCCC about solutions to improve resiliency of the grid (e.g. energy infrastructure improvements, transmission efficiency improvements, and battery backup viability).
- This work is done within ROSEI (Ralph O'Connor Sustainable Energy Institute), which has four missions:
 - o Capture carbon.
 - o Take an integrated approach to energy systems, looking at all sectors of the energy economy; how clean electricity can help decarbonize transportation, energy, and buildings.
 - o Focus on the efficient and reliable grid.
 - o Focus also on equitable energy transformation.
- There are multiple global and local organizations funding ROSEI.
 - o EPICS, Arrow, Global PST, Maryland Energy Administration, Maryland Environmental Service.
 - o Working with global partners.
- Main tool for analyses: HOPE (Holistic Optimization Program for Electricity)
 - o Goal of this analysis is:
 - Look at investment in batteries and longer duration batteries.
 - Look at how they're operated to maximize efficiency and resiliency of grid operations in Maryland.
 - Look at value over time and in different locations.
 - Look at Maryland and Pennsylvania-New Jersey-Maryland Interconnection PJM, since we'll be importing or exporting energy.
 - Identifying existing power plant sites.
 - Firm eye on system-wide benefits, cost and emissions reductions.
 - o HOPE-MD was built as a tool to be accessible to all stakeholders so that they can explore different transition scenarios and strategies themselves.
 - o Two modes for use:
 - Some build out a scenario over 20-30 years and ask how it would be operated (can be done for MD or whole PJM system to consider imports/exports).
 - Generation transmission expansion planning mode: model suggests investments that could facilitate the transition to achieve cost-effective emissions reductions and other goals that we'd want to achieve.
 - Not a model that suggests you *should definitely* do this but rather it suggests ways which could support the goals.
 - o We represent in detail state level emissions and renewable policies that support transition paths, which will evolve a lot over the coming decades.
 - Can explore the implications of different policies in MD and PJM, for example more states joining RGGI, RPS tightening, growth in data centers, etc.
- Questions for consideration
 - o What questions do you have about the role of storage and its effects on system performance?
 - o What are the goals, criteria and technology characterizations?
 - What is a good transition plan?
 - Resilience can mean different things, what dimensions of resiliency could be prioritized? One advantage of taking a modeling approach is that it makes us focus and be specific and allows us to explore implications of different

definitions of these criteria for what investments should be made and how they might be operated.

- Model will help determine cost dimensions, like the cost of 20 hr or 40 hr batteries, and what might be key in facilitating transition or what might be major obstacles and where cost reductions might be helpful.
 - Scenarios are important, but the only thing we know for sure is that any projection we make is wrong. It's important to design a system that is flexible so that we can still achieve our goals in the future, so what investments should we make now to put the system in a place that it's able to adapt as we get surprised by future developments.
 - Any input is welcome, whether group discussion or one-on-one conversations
- Del. Lorig Charkoudian: One thing I'm interested in is doing more integrated planning around concepts of bidirectional charging and thinking of resiliency and grid balancing with all the EVs, water heaters, and distributed storage. My concern is that a lot of the analyses (e.g. electrification and distribution planning analyses) that we have currently by utilities, we tend to look at electrification as a liability and burden on the system (i.e. more EVs means more load on the grid and what are we doing to respond to the peak). How do we think about this as an asset for managing load, shaving peaks, and demand response? So, I have two main questions:
 - 1. How do we integrate consideration of this electrification as load balancing, resiliency and peak shaving potential?
 - 2. How do we start thinking about our policies so that as we do the build out, we set ourselves up for that possibility? I have not seen studies that are looking at electrification as an asset. I'm primarily seeing it as a liability, so to speak. Can you talk about what you currently have, does it consider that or does it create the possibility for that kind of modeling? It is my hope that this will be something that this committee will be able to work on and drive policy in that direction.
 - Ben: A really terrific question. We've been working with Department of Energy (DOE) and RPE on a project using electric water heaters and HVAC systems as virtual batteries, such that with an HVAC system in the summer, you could pre-cool things prior to the peak period – from the grid POV this distributed energy resource looks like a battery. There is a question of how do you muster thousands of homes to do that, but this is an example of a surprise that could appear in the future. It's possible that in 20-30 years most resources will be distributed, even behind the meter, resources rather than centralized. This is a possibility we want to accommodate and take full advantage of, if it does turn out to be the case. I have a geothermal heat pump and electric vehicles, which are now not taking advantage of that purpose, so I have a personal interest in seeing this happen. And the megawatts that are there and what they could deliver in terms of performance and the costs and issues, in terms of consumer control, battery degradation are all things that should be recognized as well. In this study, we should not only be looking at lithium ion, central batteries type of deployment but also virtual power plants made of aggregations of distributed energy resources.
 - Del. Charkoudian: Thanks. You're doing the modeling and I write the policies. I try not to hope; I try to direct things and with your ability to model for us, it then becomes our responsibility to write the policy so that becomes the outcome. We create markets by the policies we write, so I think we can make that happen.

Discussion on Work Plan and Process

- Meeting dates for 2024 are as follows: May 21, June 18 (in-person, site to be determined), July 16, August 13, September 10, October 8 (in-person, site to be determined), November 5, and December 3.
- Every second meeting we will ensure that we have substantial time for updates on the study.
- Suggestions for topics and presentations of meetings? The committee may suggest things for the workgroup to discuss.
 - Landon Fahrig: I think some leadership there would be valuable. And in particular in addition to battery storage as a distributed energy resource (DER), I think addressing battery storage as a transmission asset could be valuable.
 - Del. Charkoudian: I agree. I would also say that we've started the conversation around battery storage and potential for avoiding RMR with PJM. PJM has been difficult on this conversation, but I think it would be valuable for us to move that conversation and analysis forward. We have a current RMR on Brandon Shores, but potentially other RMR on its way. So transmission asset would be one piece of it but then specifically avoidance of RMR is another component we might want to consider.
 - Andrew: If I may expand on Del. Charkoudian's point. RMR is "reliability must run" obligation that PJM's analysis says that if Wagner and Brandon Shores close down, then PJM's analysis states that these closures will provide reliability issues particularly in the Baltimore area. The solution that PJM has put forward is building more wire from out-of-state generation, particularly coming in from southeastern Pennsylvania into the Baltimore region. The ticket cost for this is in the billions. The RMR requires that the units must continue to run until the wires are built (which is expected to be 2029/30/31), so that has cost implications for ratepayers as well in the interim and units will continue to emit with impacts on air quality.
 - Del. Charkoudian: There are specifics that I won't get into now, but there's been some analysis about the real possibility that one could avoid the RMR part, but not necessarily avoid the \$800 million transmission build, but possibly avoid the RMR itself or portions of the RMR with battery storage. So I think there is more work that we can do on that. As plants are coming offline and there are possibilities of data center colocation, we could have massive reliability issues. What can storage offer in response to that from a reliability perspective? What are the avoided costs bringing massive amounts of storage on, which could add to reliability but also avoids either transmission build costs or avoids the need for some portions of an RMR?
 - Andrew: Useful for the June meeting to have a presentation on those global questions, e.g. data center demands, long term outlook for impacts for resiliency and reliability to tee up our own conversations for policy development? Any thoughts on that or are we good to tee that up for June 18th?
 - Maurice Simpson: I think that would be a great conversation.
 - Bridget O'Toole: Sen. Hester is also interested in data center demands, this sounds great!
 - Andrew: I will take it upon us to set that presentation up. Thank you, Del. Charkoudian.
 - Maurice Simpson: I know there was a conversation around the \$800 million transmission buildout and RMR. Would this body be in the position to talk about the acceleration of buildout of transmission? We know we need it, it's just a result of delayed planning. We knew that these retirements would happen and the relevant

parties had the responsibility to get this stuff up and running. So, where does this fit in with the work of this group?

- Andrew: I might posit that we should do that stepwise? If we tee up for June 18th the broad conversation about the implications of all of this coming up, i.e. what the structural challenges might be, and if we do that on June 18th, would it make sense to stepwise say let's alright, let's have a conversation during the July meeting on whether there's policy development in that somewhat narrower subject matter of transmission. Are you thinking about ways to streamline or to have greater efficiency on buildout of transmission?
- Maurice Simpson: Yes.
- Andrew: For the workgroup members, would that make sense to tee that up for the July 16th meeting, which will sort of decant out of the June 18th conversation? We will do so. Del. Charkoudian also raised the more specific points about bidirectional, distributed generation, etc. My instinct would be that that would potentially be a piece of recommendation that we would bring forward to the Commission at large. Is that a separate conversation, say for August? That might be a valuable piece to do that discrete conversation with the intent of developing over the weeks after that recommendations for the commission. Any objections? Do you think that makes sense for the August meeting?
- Cindy: I did want to make a quick point, which is that all the recommendations per working group, including this one, will go to the entire commission for consideration and voting, and only the ones that are approved will make it into the annual report to the Governor and General Assembly.
- Maurice: Just a point of clarification: we are discussing the topics now for this working group to discuss, and we could potentially come up with recommendations for each of these different topics and those will get sent to the full commission for consideration whether our recommendations from this work group that they adopt will then move forward. Is that what I'm hearing?
- Andrew: Yes that is correct. This WG does have an obligation to provide the General Assembly (GA) and Commission with a study, but that's the only piece that we unilaterally distribute. Other than that our obligation is very precisely to stay within our lane of recommendations to the Commission at large.
- Andrew: Please reach out if you have any more comments as we build this out.

Public comments

- No public comment.