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Maryland's Renewable Energy Policy & Landscape: Overview & Analysis

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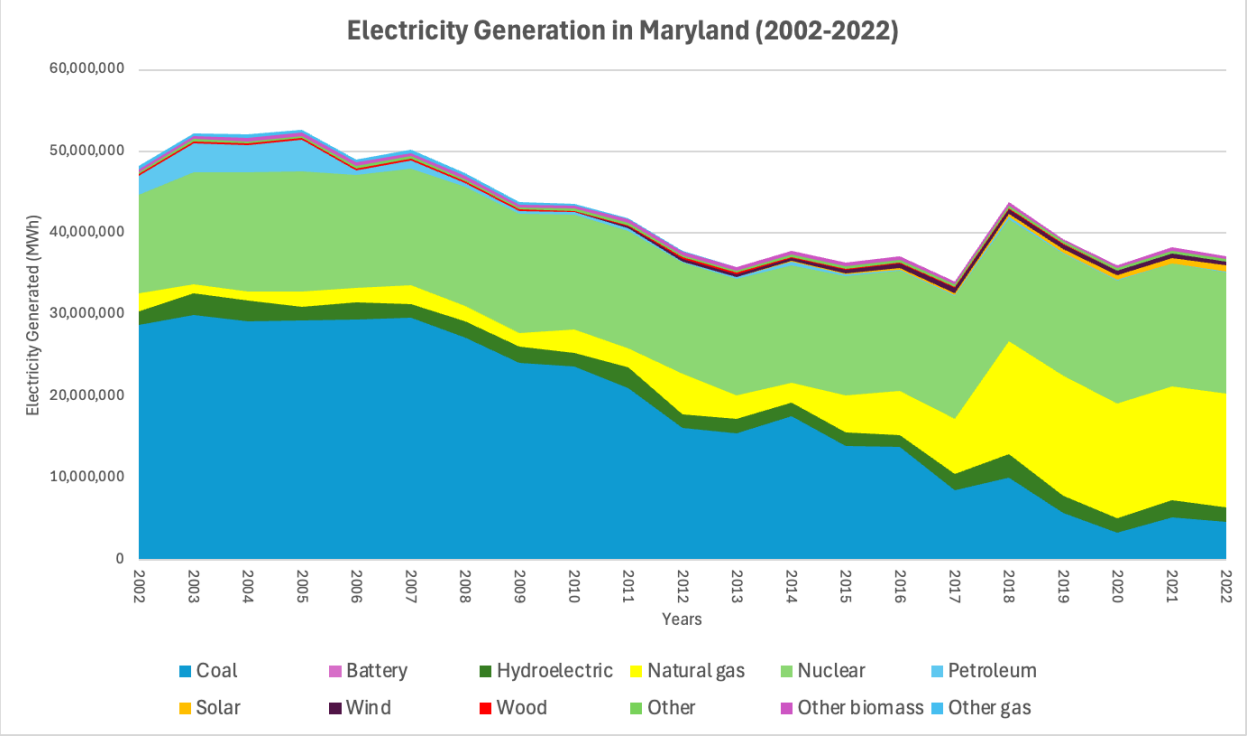
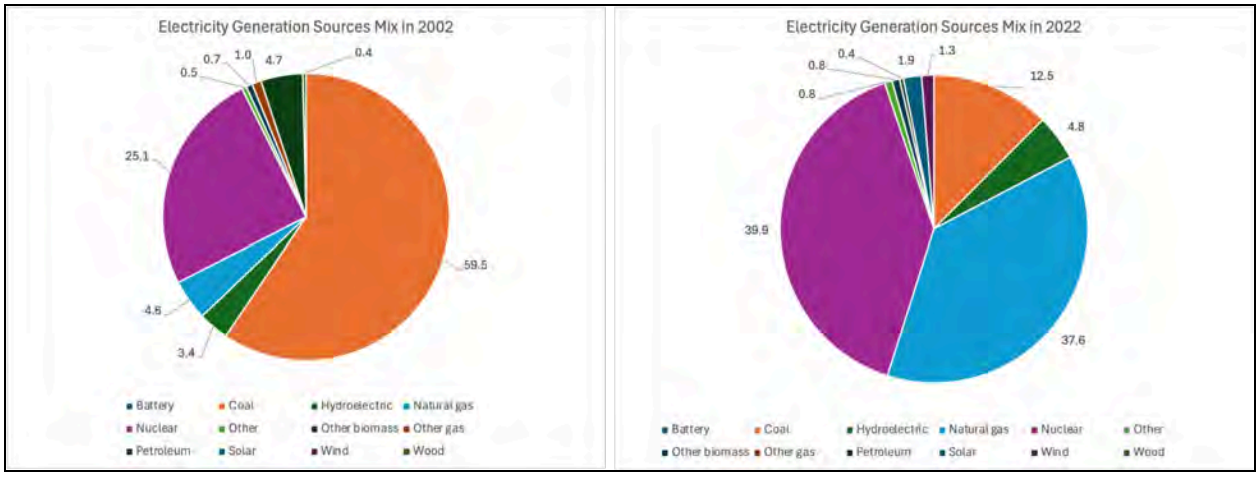
I. BACKGROUND

Existing Electricity Mix and Providers

The State of Maryland consumes more energy than it generates. In 2022, Maryland's electricity consumption reached 61.8 TWh of which only 37.13 TWh were generated in-state, a significant decrease from 48.27 TWh in 2002.[1] Electricity consumption is dominated by the residential sector accounting for 47% of the state total. It is followed by the commercial and industrial sectors accounting for about 46% and 6% respectively. Historically, Maryland has generated more than half of its electricity from coal-fired power plants as shown in Figure 1(a), but this has decreased to below 50% since 2012 in line with the continuing retirement of coal power plants.[2] There are only two remaining coal power plants in the state with a capacity of 1.7 GW; they are planned for decommissioning in 2025. Figure 1(b) and 1(c) show that coal has undergone a significant reduction over time and has led to an increase in natural gas and nuclear power utilization up to 75%. Furthermore, Maryland continues to use petroleum as primary energy source for electricity generation with a production of 142.86 GWh in 2022. Although petroleum use is close to 0% of the mix, its inclusion in the energy mix is incompatible with climate commitments.



(a)



(b) (c)

Figure 1. (a) Historical trending of electricity generated in Maryland during 2002-2022, (b) Electricity generation shares in 2002, and (c) Electricity generation share in 2022.[1]

Renewable energy sources such as wind, solar, and biomass are growing, but the pace to increase their capacity is not fast enough to keep up with the required demand following the retirement of fossil fuels. That said, a significant change in renewable energy growth may be the best option looking forward, as the incumbent generation of energy production facilities in Maryland is aging. Table 1 depicts the age of the electricity generators in Maryland by fuel type that revealed the majority of electricity generators are aged more than 31 years except for natural gas and renewables.Therefore, building renewable energy becomes more promising compared to building new fossil fuel generators to replace the outgoing ones. With a collective capacity of ~7,215 MW, new renewable generators are queuing to connect to the PJM Interconnections. The pie chart in Figure 3 shows that most queuing generators to connect to the grid are solar and energy storage. Furthermore, renewable energy deployment and fossil fuel retirements result in a positive impact on the average emissions in Maryland. As shown in Figure 3, Nitrogen Oxides and Sulfur Dioxide emissions significantly decreased after fossil fuel retirement in 2012, while carbon dioxide emissions dropped in 2017.

Table 1. Age of Maryland Generation by Fuel Type, 2020.[3]

Primary Fuel Type	Age of Plants, By Percent			
	1-10 Years	11-20 Years	21-30 Years	31+ Years
Coal	0%	0%	17%	83%
Oil	6%	6%	10%	79%
Natural Gas	37%	28%	15%	20%
Nuclear	0%	0%	0%	100%
Hydroelectric	0%	0%	0%	100%
Other and Renewables	72%	23%	1%	4%

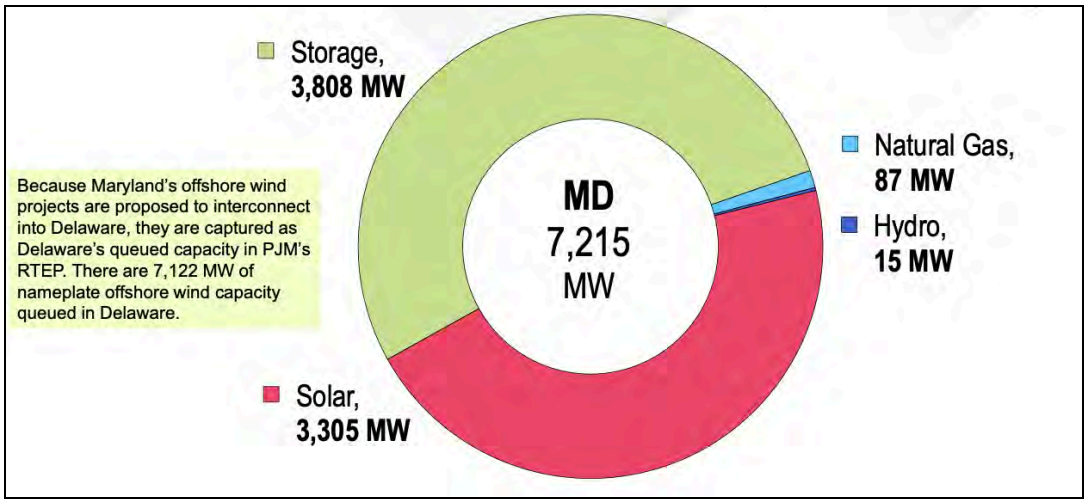


Figure 2. Maryland queued capacity as of April , 2023.[4]

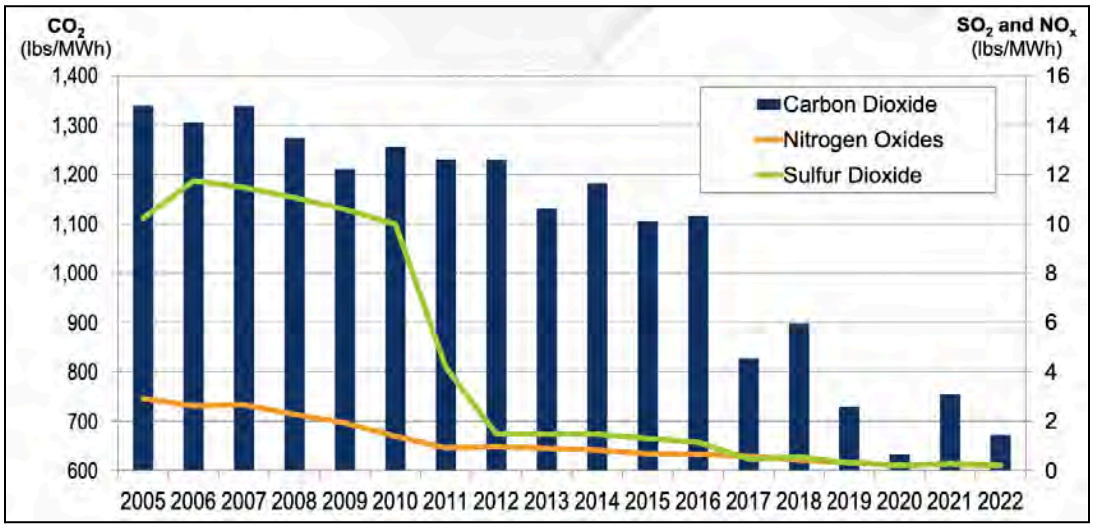


Figure 3. Emission reductions in Maryland by 2022.[4]

Maryland provides several types of utilities such as investor owned utility (IOU), municipal utility or public utility, and electric cooperatives. As shown in Figure 4, IOUs are in the lead among providers, serving nearly 2 million customers in 2022. Figure 5 provides the service territory of utility in Maryland. The biggest IOUs are Baltimore Gas and Electric (BGE), Pepco (Potomac Electric Power Company), Delmarva Power, and Potomac Edison. BGE is the most significant provider since it serves the largest metropolitan area (Baltimore) in the state and handles a large share of electricity generation and distribution, serving about 1.3 million customers. Maryland also has five municipal utilities which operate in Berlin, Easton, Hagerstown, Thurmont, and Williamsport, although they only account for 1.2% of electricity end-used retail consumption. This number is less than electric cooperatives which are primarily operating in rural and less densely populated areas such as Eastern Shore and Southern Maryland.

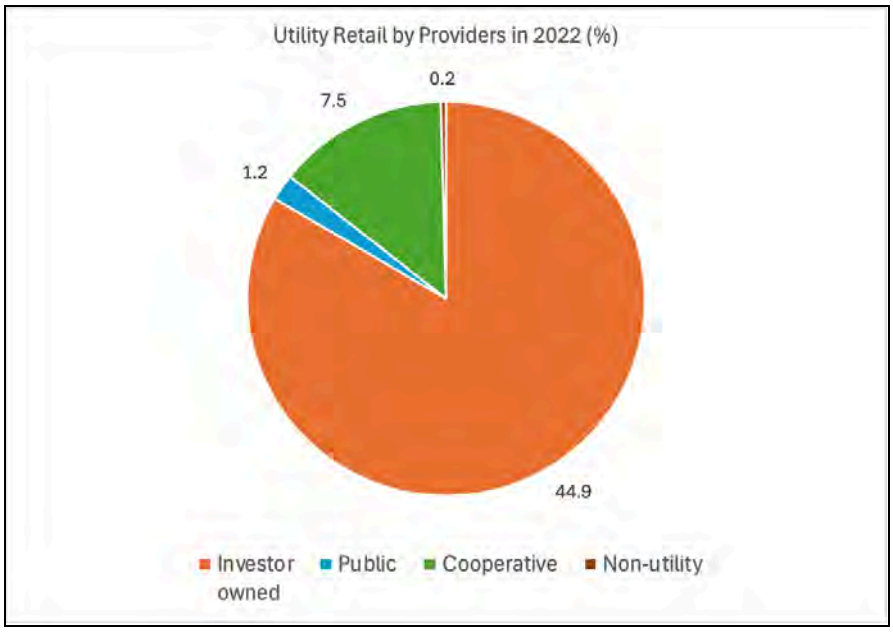


Figure 4. Utility providers in Maryland.[1]

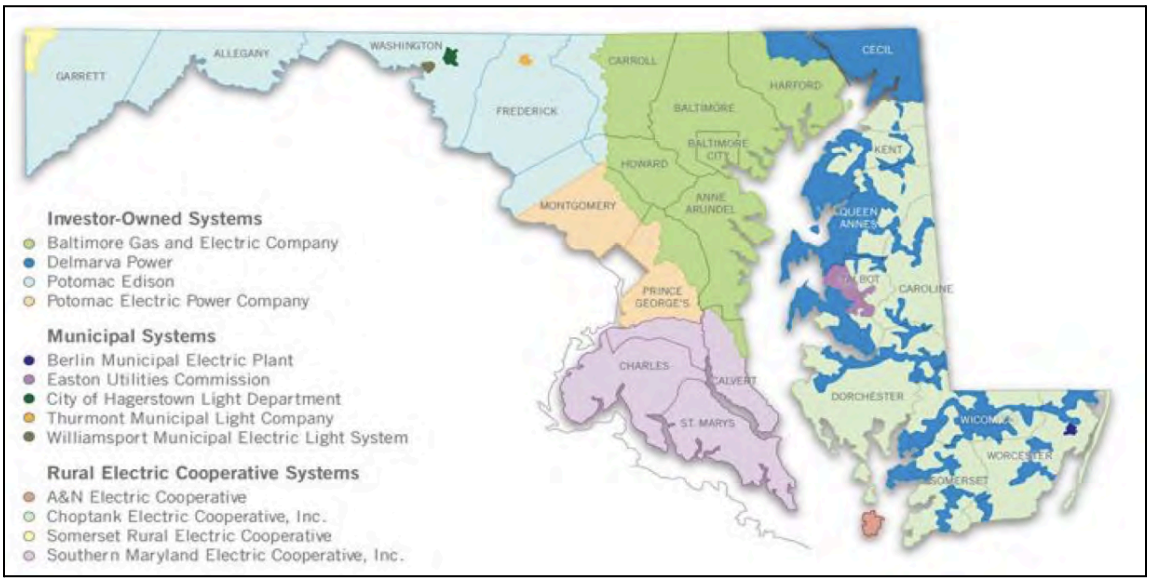


Figure 5. Maryland Utilities and Service Territories.[3]

Renewable Energy Potential

Given its size Maryland has great potential for renewable energy generation, although this potential is not currently realized. As of 2023, Maryland generates just over 4,000 GWh of electricity via renewable energy, equating to roughly 11% of total in-state electricity generation and around 6.5% of the total electricity demand.[5] However, as Maryland imports roughly 40% of its utilized electricity, it will be challenging to develop enough renewable infrastructure to completely forgo reliance on energy imported from other states.[6]

Solar Energy

The annual solar installation fluctuated between 2014 and 2023, as shown in Figure 6. As a result, Maryland has 2,225 MW of installed solar capacity by 2024, with projections showing the possibility of that capacity doubling within the next five years. Assuming a stagnant electricity demand, solar development projections holding true, and Maryland meeting the national average solar capacity factor of 24.5%, solar should produce over 15% of Maryland's electricity demand by 2030. However, factoring in the Maryland Public Service Commission estimates that electricity demand will grow by approximately two percent per year until 2031, that number falls to 13.7% in 2030, below the current RPS threshold of 14.5% by 2030.[7]

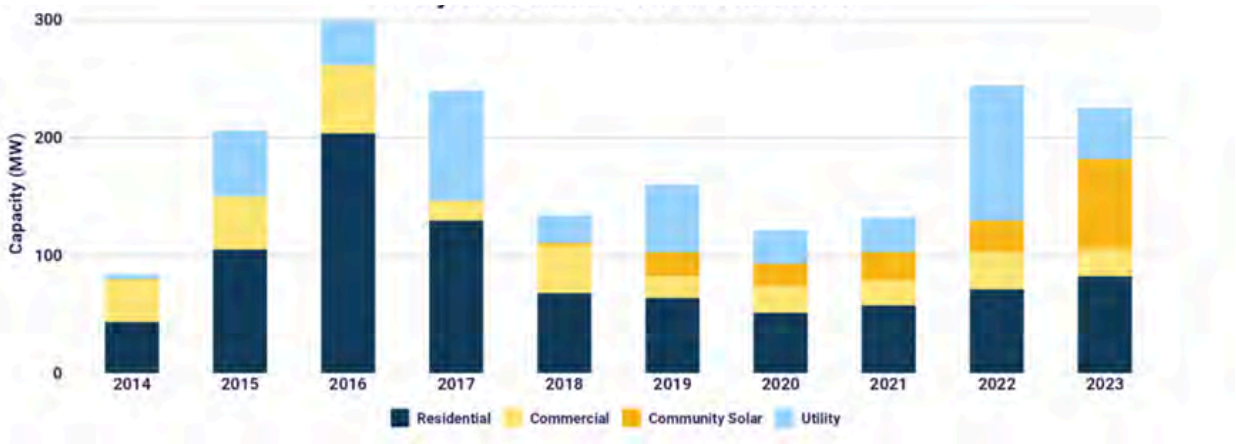


Figure 6. Maryland Solar Installations.[6]

Interestingly, nearly 60% of solar installations in Maryland are classified as small-scale, or installations under one MW, whereas utility scale solar installations dominate nearly 70% of the market nationwide.[8] As Maryland is a fairly small state by land area, a continued push for residential and small-scale solar projects will play a large role in ensuring RPS goals are met. Utility scale solar development is also critical to Maryland's transition which accounted for 448 TWh generation potential annually. As shown in Figure 7, the highest utility solar potential is located in Queen Anne and Caroline County with annual potential generation of 34 TWh for each. Despite the state's small size, large swaths of its landmass are rural, with nearly one third of its total landmass used for agriculture. As of September 2024, 18 utility scale projects totaling nearly 125 MW are under review by the state of Maryland.[9] While many will likely face opposition from local populations and concerned environmental groups, utility scale solar is expected to play a key role in future solar development.

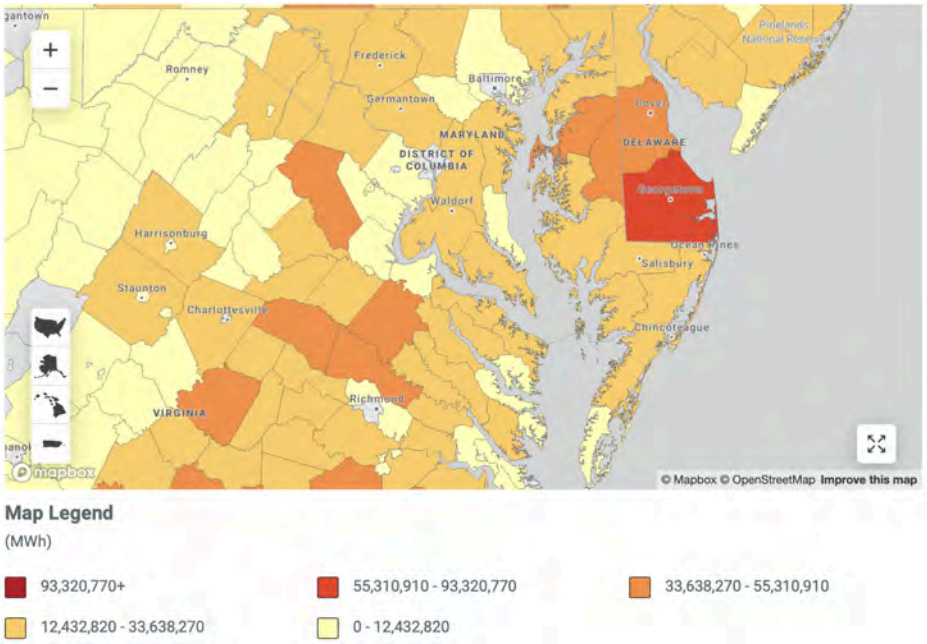


Figure 7 (reproduced). Annual generation potential of utility solar in Maryland.[10]

Wind Energy

Wind development will be critical for Maryland to meet its renewables transition metrics. Despite the state placing a heavy emphasis on wind in its transition plan, wind generation between 2016 and 2023 decreased by nearly 9%, as shown in Figure 8.[5] The decrease in wind happened because of the interannual wind speed variations and weather changes due to El Nino effect.[11]

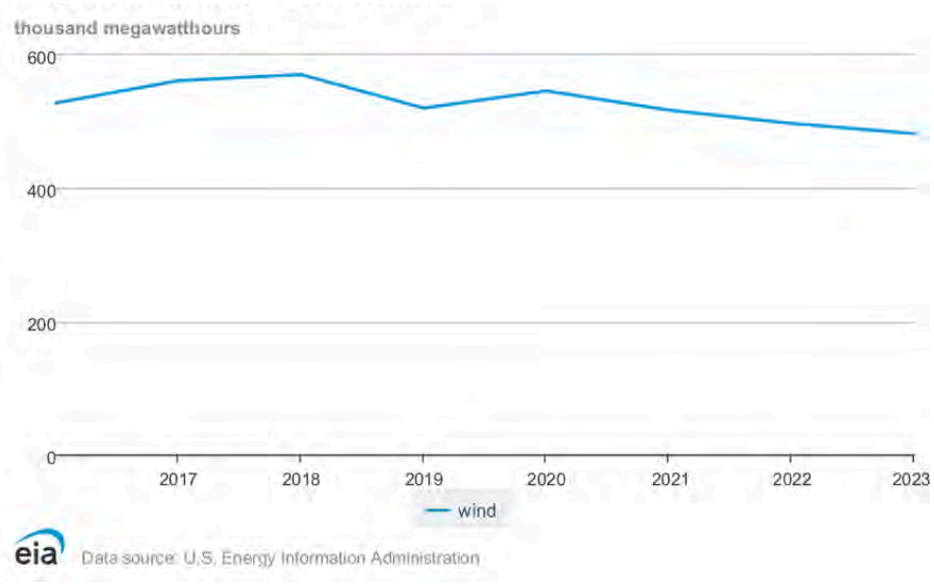


Figure 8 (reproduced). Maryland Annual Wind Generation (GWh). [5]

In 2023, Maryland produced just 482 GWh of wind energy, providing just 0.7% of the state's electricity. Currently, installed wind turbines are limited to the western portion of the state where the best wind resources are located, as shown in Figure 9.

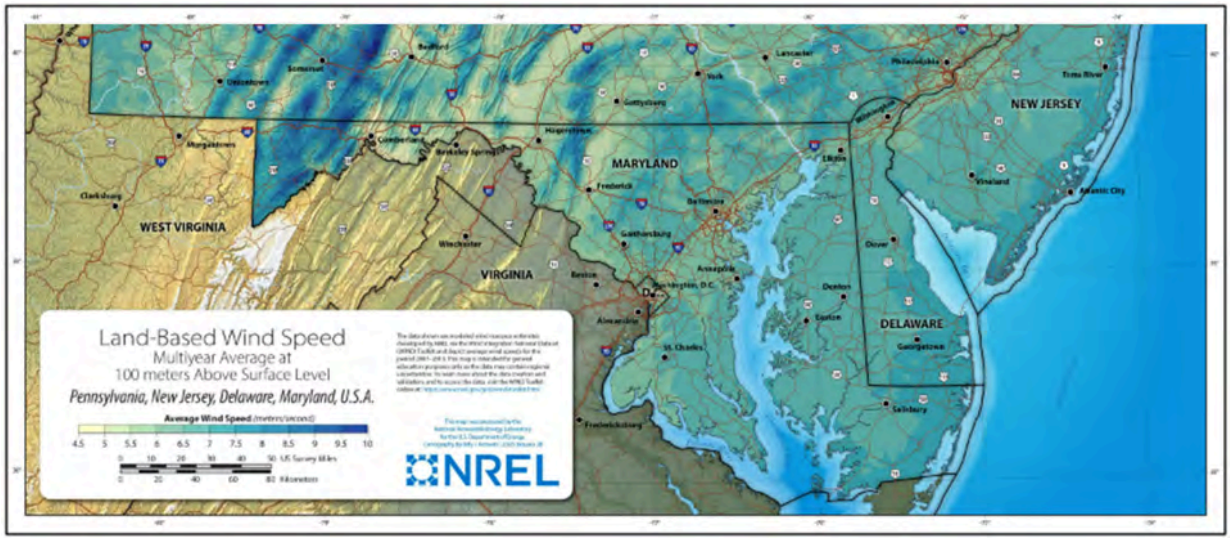


Figure 9 (reproduced). Maryland Windspeed at 100 Meters Above Surface Level[12]

Due to limited inland wind resources, the majority of Maryland's wind potential lies offshore which is located on the eastern side, as shown in the map in Figure 10. While four large offshore development projects are in progress, there is currently no in-use offshore wind infrastructure. Three of the four projects, Skipjack (phases I & II), Momentum, and Marwin, are currently slated to be completed and in operation by 2026 and would combine to produce over 17,500 GWh of power per year. Assuming a national average 44% capacity factor for offshore wind, these projects combined would provide over 12% of Maryland's 2023 electricity demand. A fourth project, The Maryland Offshore Wind project was approved in September of 2024 and is slated to provide a further 17,500 GWh of power.[13] Should all four projects be completed, offshore wind could contribute a quarter of the state's electricity demand within the next decade. Despite the ample wind resources offshore, there are major concerns with the financing of new offshore projects. In early 2024 Ørsted withdrew their bid to develop both Skipjack projects, citing increased financing costs from the time when the project was originally proposed.[14]

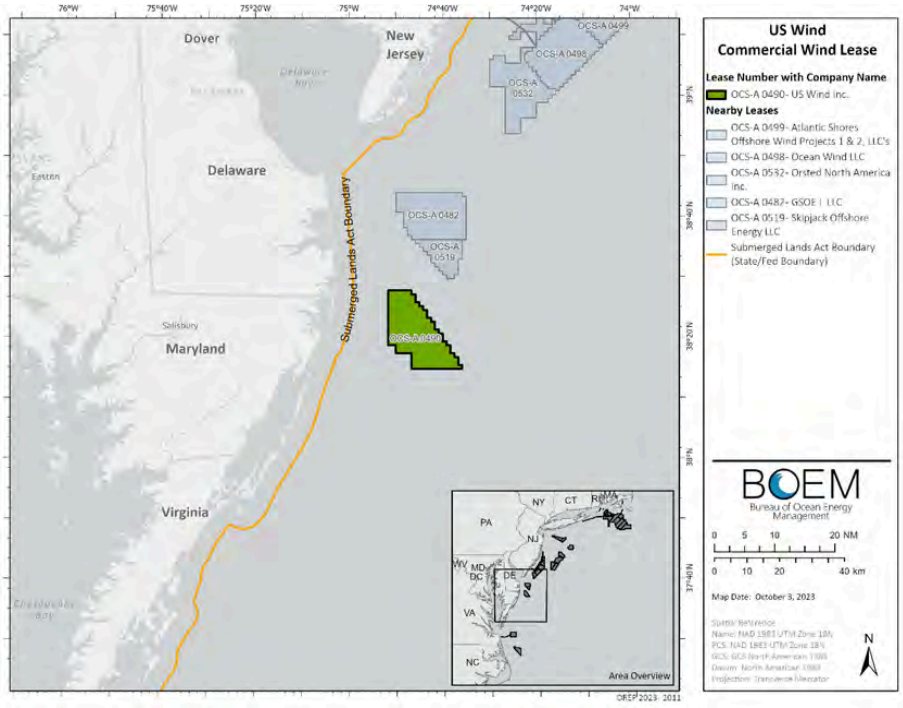


Figure 10 (reproduced). Maryland Offshore Wind Development Sites[15]

Hydroelectric Energy

Hydroelectric provided roughly 4.8 percent of Maryland's electricity demand in 2022. Hydroelectric generation was provided almost exclusively by the Conowingo Hydroelectric Station located on the Susquehanna River in northeastern Maryland. While the Conowingo produces nearly 130% more power than it did upon its opening in 1928, there is no significant effort underway to produce additional hydroelectric power in Maryland.[16]

Biomass Energy

Biomass energy, derived from agricultural residues, forestry products, and organic waste, represents another avenue for renewable energy in Maryland. In 2022 Biomass produced roughly 330 GWh of power, or just under one percent of the state's generated electricity and roughly 0.5 percent of the total electricity demand. While there have been calls to increase biomass energy production, especially stemming from wood fuels, no major initiatives are currently in place to significantly increase the usage of biomass as an energy source.[17]

Literature Review of Policy Impacts on Renewable Energy Development

Existing research exploring the current impacts of Maryland's energy policies on renewable energy deployment is somewhat limited in relation to the complexity of the state's

energy and carbon emission policies. There are a few notable examples of renewable energy policy research involving Maryland as a case study. The most direct example is a case study discussion of the impact of Maryland's statutory inclusion of Municipal Solid Waste as a renewable energy source on the continued deployment of waste incineration facilities.[18] Two additional journal articles focus on the economics of Maryland energy policy include an analysis of the state's renewable energy credit pricing method[19] and an assessment of Maryland energy policy uncertainty's impact on investment in solar energy.[20]

Although there is little present policy impact research, the past few years have seen the growth of a substantial body of literature outlining the state's current energy policies themselves along with future facing energy scenario modeling under both the current and proposed policy portfolios which seek to aggressively enhance renewable energy deployment. These policy analyses are products of the many state government entities involved in or related to energy policy; this includes the Maryland Department of the Environment (MDE), Maryland Energy Administration (MEA), Maryland Public Service Commission (MPSC), Maryland Department of Legislative Services' Office of Policy Analysis (OPA), the Maryland Clean Energy Center (MCEC) and the University of Maryland (UMD). Starting with the OPA, their recently published "Introduction to the Renewable Energy Portfolio Standard" report provides an overview of the state's Renewable Energy Portfolio (REP) as it stands today along with a history of key revisions since its introduction in 2006.[21] Of most relevance to historical impacts of the state's policies on renewable energy development, the report includes both statutory definitions of acceptable renewable energy sources for REP compliance purposes along with dynamic carve-outs for specific renewable energy sources such as solar, geothermal, and offshore wind (p. 3).[22] The MEA budget analysis also provides relevant insights into the state's renewable energy subsector, including a discussion of how the state's aggressive jump in REP solar carve-outs from 2018-2019 has since led to a significant increase in alternative compliance payments in lieu of a correspondingly steep jump in solar generation (pp. 17–18).[23] Turning to UMD's School of Public Policy, the Maryland Climate Pathway report lays out various long-term future-facing policy scenarios with impact analysis centered around CO2 emissions, which includes an analysis of electricity sector policies such as a proposed cap-and-invest program and a proposed targeted 500% increase in wind and solar energy generation by the end of the decade (p. 35).[24]

The Impact of Physical, Demographic, Economic, & Political Geography on Policy

Economic Context

The key economic drivers in Maryland are mainly dominated by government activities and related services in around Washington, D.C. Several federal government agencies are located in Maryland including the National Security Agency (NSA), National Institutes of Health (NIH), and military facilities of the U.S. Department of Defense.[25] This sector drives the largest share of employment and revenue in Maryland. The existence of NIH leads to economic growth

in biotechnology and life sciences. It is also supported by high education facilities such as John Hopkins University. Another technology that contributes to employment in Maryland is information technology and cybersecurity, as there are over 1,200 cybersecurity companies in the state.[26] In addition, tourism and agriculture are also key drivers in Maryland. These include areas like the Chesapeake Bay, Ocean City, and several historical sites. In the agriculture industry, the eastern shore is the most significant agricultural region in Maryland which has key products such as poultry, corn, soybeans, and vegetables. Meanwhile, Northern Maryland and Western Maryland are popular with dairy production.[27] Lastly, Maryland has the Port of Baltimore which is one of the largest and most important ports in the U.S. The majority of coal export from the U.S. has departed from the port of Baltimore.

Public Land

Just over 11 percent of Maryland's 6,319,000 acres is publicly owned with the Maryland Department of Natural Resources directly controlling 502,393 acres and the federal government owning 205,362 acres. Federally owned land is mostly split between the Fish and Wildlife Service (24%), National Park Service (20%), and the Department of Defense (55%).[28] The majority of public land is in rural areas set aside for conservation. The map in Figure 11 shows publicly protected land and its area across Maryland. The Maryland the Beautiful Act of 2023 created two conservation milestones for the state: conserve 30% of the state by 2030, followed by 40% in 2040. As of 2024 more than 1.85 million acres have already been conserved, meeting the 2030 milestone six years early.[29] Another 600,000 acres will need to be conserved to meet the 2040 goal of conserving 40% of the state.

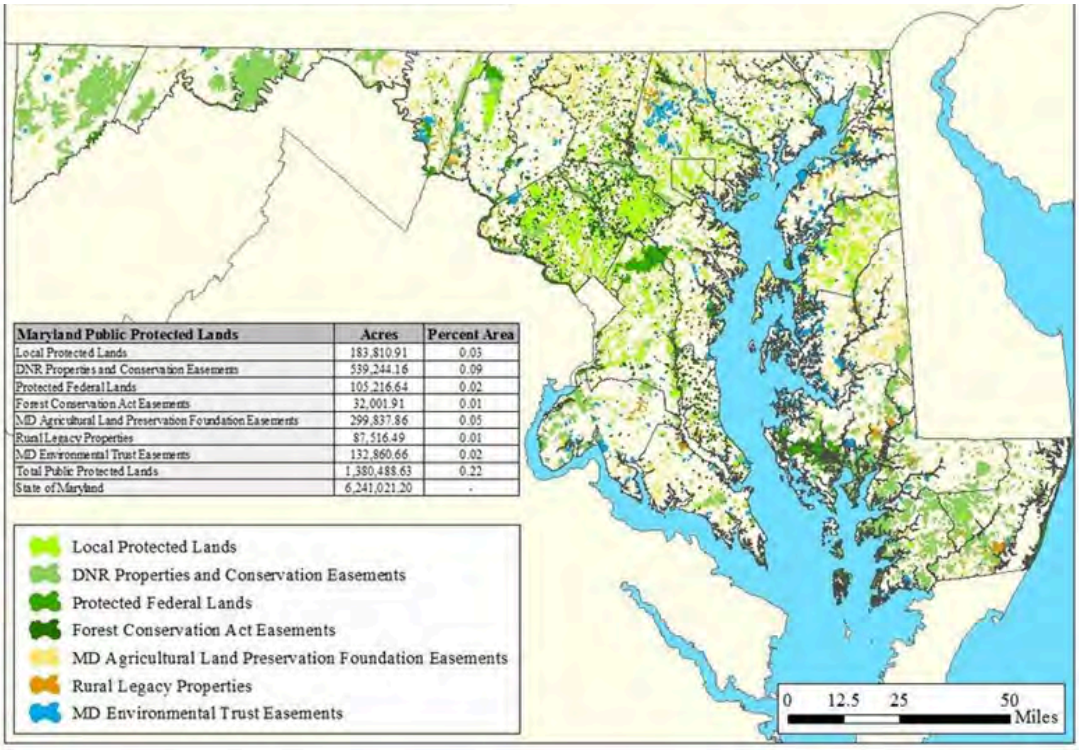


Figure 11 (reproduced). Maryland Public Protected Lands[30]

Demographic Context

According to the 2020 census, Maryland's population grew 7% to 6,177,224 in the previous decade.[31] The most populated county's population density is 2,153.8 people per square mile (population increased by 9.3% since last Census), while the least populated is 69.3 people per square mile (population decreased by 4.9%). Counties to the west and east saw population decreases and the central counties increased. The rural counties with decreasing population will be the portions of the state where renewable energy is most likely to be sited. It will be important to understand the underlying ideology around why those folks live there to be able to predict how they might feel about such infrastructure. The population growth is concentrated in liberal areas, likely leading to a strengthening base of support for renewable energy policies in the state despite not likely being the areas where renewables will be sited.

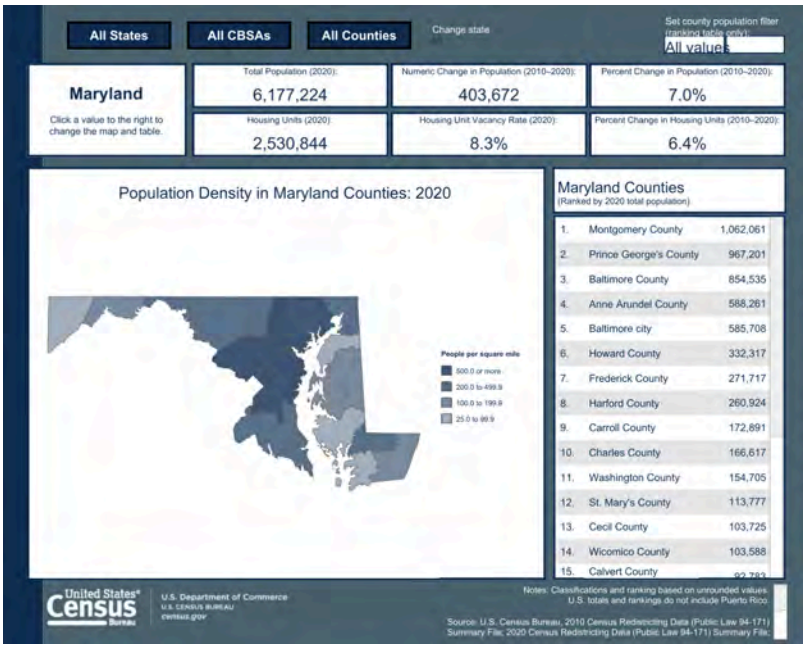


Figure 12 (reproduced). Population in Maryland.[32]

The political affiliations in these geographic regions align closely with population density. As seen in Figure 12 and 13, the less dense, more rural eastern and western regions tend to vote republican, while the central, more densely populated areas tend to vote democratic.[33]

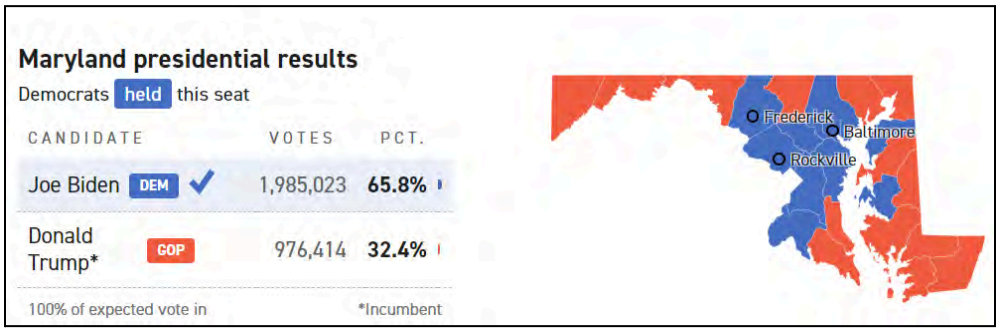


Figure 13 (reproduced). Political view in Maryland.[34]

Political Environment

Maryland can confidently be considered a politically blue state. Currently, there is a Democratic governor, with a democratic house and senate. Since 1978, Maryland has only elected three republican governors, most recently, Larry Hogan who was in office from Jan 2015 through Jan 2023. The current governor is Wes Moore, a democrat who took office in January 2023. He won the election with 64% of the vote.[35] During the most recent United States presidential election, Joe Biden, the Democratic candidate received 65.4% of the votes, while the Republican candidate, Donald Trump, only received 32.2%.[36] Both the recent gubernatorial and presidential election followed similar voting patterns by party in each county.

Maryland State Politics

In the 2022 gubernatorial election, renewable energy was part of the conversation. Moore was running against Dan Cox, who was named to the LCV (League of Conservation Voters) Victory Fund's list of worst candidates for the environment.[37] Cox was a known climate science denier, MAGA loyalist. On the other hand, Moore ran on a platform supporting the transition to 100% renewables by 2035 in Maryland. Moore specifically supports further development of off-shore wind, focusing on workforce development, battery storage research, and prioritizing environmental justice. He appointed the state's first Chief Sustainability Officer and the first Chief Resilience Officers to help support public-private partnerships to address current and future effects of climate change.[38] He voiced support for minimizing the costs associated with the energy transition on Marylanders while ensuring reliable access to power.[39]

The current Chair of Senate Education, Energy, and the Environment Committee is Senator Brian J. Feldman. He is an outspoken advocate for renewable energy in Maryland. He is a member of the Center for Climate Integrity[40] and sponsored the Clean Energy Jobs Act. The current Chair of the Environment & Transportation Committee is Delegate Marc Korman. He supports increasing renewable energy use in Maryland, champions RGGI, voted in favor of increasing the state's renewable energy goal and authored a bill to advance the deployment of energy storage in the state. In addition, he supports protecting wild and open space.[41]

II. MARYLAND'S POLICY LANDSCAPE

Explicit Climate Policy

In December 2023, Maryland released the Climate Pollution Reduction Plan (CPRP). It was released as an Executive Order on January 1, 2024.[42] The plan was created following the Climate Solutions Now Act of 2022, which required plans to meet the new climate targets. This plan sets forth the state's policies that aim to reduce greenhouse gas emissions by 60% by

2031 (as compared to 2006 levels) and outlines a pathway to achieve net-zero by 2045. The policies in the plan touch many different sectors including transportation, buildings, industry, waste, agriculture, forestry and land use; however, this paper will only focus on policies relating to the electricity sector.

The CPRP includes six policies aimed at reducing greenhouse gas emissions associated with the electricity sector. Three of the six– the POWER Act, Energy Storage Act, and State Incentives for Renewable Energy– existed prior to the CPRP and the CPRP does not require any changes. Two more– the RPS and RGGI– existed before CPRP, but the CPRP requires modifications to the current policies. And the sixth policy, the CPS is brand new to Maryland's suite of renewable electricity policies.[43]

RPS

Maryland passed its first RPS in 2004. In 2017, the state legislature overrode a veto by then Governor Hogan, which increased the required renewable energy procurement percentage for electricity suppliers to 25%. This requirement was increased to 50% in 2019.[44] The CPRP, though, would require another RPS update and increase. The new target is 52.5% of electricity sourced from renewable energy sources for non-municipal utilities and 20.4% for municipal utilities by 2030.

In order for this new RPS to go into effect, the Maryland Legislature will need to pass legislation to codify these new requirements. The RPS is an essential component of Maryland moving forward with its climate goals, since it promotes and encourages renewable energy development. However, since it is managed through a REC market, its effectiveness relies on the power sources that are included in the REC market. For this reason, enactment of the CPS is important to remove waste-to-energy from eligible electricity sources.

CPS

The CPS will work alongside the RPS to meet both greenhouse gas emission reduction targets and to meet the goal of 100% clean power by 2035. The RPS primarily focuses on the development and use of renewable energy, whereas the CPS is a broader policy that includes other clean energy technologies such as nuclear and carbon capture and storage. The CPS takes a larger-picture approach to decarbonizing the grid, in a way not limited to renewable energy sources. This policy has not been finalized or enacted, but there is support for it to define clean power as including wind, solar, hydro, nuclear, and energy storage, while removing municipal solid waste as a qualifying energy source under the RPS.

In Maryland, the RPS is supported by the sale of Renewable Energy Credits (RECs). The RPS includes two tiers of renewable energy: Tier 1 and Tier 2. Tier 1 includes solar, wind, qualifying biomass, methane from a landfill or wastewater treatment plant, fuel cell producing energy from Tier 1 source, poultry litter-to-energy, waste-to-energy, and refuse-derived fuel. Tier includes hydroelectric power that is not from pump storage.[45] The proposed CPS would remove eligibility for municipal solid waste incineration as an appropriate Tier 1 source.

The CPS is important to making the RPS even more impactful by removing waste-to-energy from the eligible list of renewable energy sources. The CPS is important to facilitating the renewable energy transition since it makes it very clear that Maryland will only be supporting truly “clean” energy moving forward.

POWER Act

Enacted on June 1, 2023, POWER Act stands for “Promoting Offshore Wind Energy Resources.” It was codified into law when both Senate Bill 781 and House Bill 793 were passed. The POWER Act builds on the Offshore Wind Act of 2013 and the Clean Energy Jobs Act of 2019 that required development of 2 MW of offshore wind with appropriate labor force support. The Offshore Wind Act of 2013 created a carve-out for offshore wind under the RPS and the Clean Energy Jobs Act, among other provisions, expanded the existing offshore wind targets.[46] The POWER Act sets a goal of 8,500 MW of offshore wind capacity by 2031. 8,500 MW is a goal and is not directly tied to any implementation or enforcement mechanisms. By stating their intended growth, Maryland will be more likely to be granted large lease areas from the Federal Bureau of Ocean Energy Management.[47]

The POWER Act also provides opportunities for developers, US Wind and Orsted to fill their existing lease areas with turbines, without charging ratepayers anything. Prior to the POWER Act, the Clean Energy Job Act had required utilities to purchase Offshore RECs, in addition to setting a cost cap to ratepayers. The goal was to create a financing mechanism for these large and expensive projects. The Act mandated that utilities include ORECs as part of RPS compliance. This provision was a strong signal that Maryland was supporting the financing of expensive wind projects. Despite these mandates, US Wind and Orsted had leased areas, but were not filling that area to capacity with turbines. The POWER Act further supports development while removing risk to ratepayers. The POWER Act also requires the Department of General Services to begin considering signing PPAs with offshore wind developers. There is no requirement to enter these agreements, in order to ensure the DGS does not enter agreements where the offshore wind is more expensive than wholesale electricity.[48]

The Act also includes required updates and expansion of the transmission system in the state in order to support the growth of offshore wind capacity. In order to build these, first the MPSC must work with PJM Interconnection to conduct a study, followed by a call for proposals for the projects.[49] As of July 1, 2024, the MPSC has submitted a Status Update Report to the Maryland General Assembly. The report outlines the various meetings that have occurred and concludes that MPSC will continue to work with PJM to complete the analysis ahead of the transmission project application process in 2025.[50]

Maryland has a lot of offshore wind potential and the ability to develop offshore wind capacity will help the state meet its net-zero and greenhouse gas reduction targets. The MPSC has approved four offshore wind projects, but transmission projects will not be slated for review and approval until late 2027,[51] so there likely will not be much movement for a while. The

POWER Act is important as it brings attention to the offshore wind potential in Maryland. However, it does not include mandates or enforcement mechanisms, so it is unlikely that the POWER Act will result in a lot of tangible action. It is encouraging that the MPSC has begun working with PJM Interconnection to understand what is needed to update and improve transmission to support offshore development.

Energy Storage Act

This Act was passed by the Maryland House and Senate in 2023 and sets a target of 3,000 MW of energy storage available by 2033. The Act specifies that these targets should be met in a cost-effective manner and if these targets are not reasonable, they will be reduced to the "maximum cost-effective amount."[52] Energy storage could include thermal storage, electrochemical, virtual power plants (VPPs), and hydrogen-based storage. This Act applies only to investor-owned utilities and requires installation or contract for energy storage devices, in addition to contracts for energy storage credits. Since storage is an important component to a successful renewable energy-based grid, this Act is an important step. It will be interesting to see how the "cost-effective" clause will affect development and how attainable the 3,000 MW target is within those bounds.

RGGI

Maryland was a participant in RGGI before the CPRP was published. However, since Maryland's reduction targets have increased, their state perspective on the strictness of RGGI has too. Maryland is advocating for the RGGI cap to be stricter in order to meet their greenhouse gas reduction targets. If the coalition of RGGI states cannot agree on a cap that satisfies Maryland's requirements, the Maryland Department of Energy (MDE) will consider additional state regulations to meet their goals.[53] MDE has also committed to negating the lesser used components of RGGI which include offsets and the Limited Industrial Exemption Set Aside.

It is important that Maryland publicly state their intentions for RGGI, however, with little power to enact changes, they will need a coalition to actually create the changes they want to see. Unless other states have similar goals, it is unlikely that RGGI will change in the exact way that Maryland hopes.

State Incentives for Renewable Energy

The final policy included in the CPRP aims to strengthen and amplify Maryland incentives for renewable energy development. These include: public-private partnerships through the Maryland Clean Energy Center, the Maryland Energy Storage Income Tax Credit Program and the Maryland Solar Systems Sales Tax Exemption. The MEA also offers a variety of incentives including grants, rebates, loans, and technical assistance.[54]

The main concern over the CPRP in Maryland is its price tag. In order to meet the targets and goals set in the plan, it would cost the state $1B annually. There is also tension between certain proposed policies and economic development. For example, the state wants to entice large data centers to come to Maryland. To lure them, there is a bill that exempts diesel-powered backup generators from MPSC regulatory review. Maryland will need to figure out how to balance corporate development, jobs creation, and achieving lofty climate goals.[55] Additionally, in order to meet many of the lofty targets, offshore wind development is essential, yet there are many delays and blockers to those projects moving forward.[56]

Public Service Commission

The Maryland Public Service Commision (MPSC) oversees the utilities. According to their mission statement, some areas they are concerned with include: rates being just, reasonable, and transparent; standards and policies that protect the safety of the public; innovation that supports efficiency delivery; economic, environmental and climate impacts of matters before the Commission; and conservation of natural resources and environmental preservation.[57]

Through the CPRP, the MPSC has been given some additional directives to consider and oversee. The MPSC must continue to efficiently approve new renewable energy projects, in order to continue moving towards meeting RPS and CPS targets and requirements. For more information of the MPSC's role in siting, see "Current Renewable Energy Siting Policy." Lastly, as part of the CPS, the MPSC will be involved with other stakeholders in developing rulemaking for this CPS policy.[58] Passage of CPS legislation will codify the goals set out in the CPRP.

Current Renewable Energy Siting Policy

Maryland's current policy on renewable energy is primarily governed by state statutes that regulate the construction and operation of energy generation facilities. At the forefront of this regulatory framework is the MPSC, which mandates that any entity seeking to construct a generating station greater or equal to two MW, qualified lead line, or overhead transmission line capable of carrying over 69 kV must obtain a Certificate of Public Convenience and Necessity (CPCN).[59] While smaller generation or transmission projects may be exempt from a CPCN, MPSC approval is still necessary before construction can commence.

Maryland Public Utility Companies Section 7-207 establishes that the MPSC preempts local zoning regulations.[60] Despite MPSC having the ultimate authority over renewable development, local authorities are required to be notified of all CPCN applications and have the opportunity to provide comments and recommendations (see Figure 15 for additional details on the CPCN process). Additionally, the Maryland Department of Natural Resources provides a comprehensive review through its Power Plant Research Program (PPRP) that the MPSC reviews before a decision is made.[61] Furthermore, local governments can officially file as

intervening parties to formalize their input to the MPSC and have in the past cited the PPRP's findings to justify their dissent.[62]

However, even with a dissenting intervening party, the MPSC still holds the ultimate authority on the status of development projects through a formal adjudication process, where a public utility law judge (PULJ) is appointed to ensure the legality of the MPSC decision.[63] MPSC's preeminence over local zoning was upheld in the 2019 Appeals Court decision "Bd. of Cnty. Comm'rs of Wash. Cnty. v. Perennial Solar, LLC", when Washington County Officials sued after a CPCN was issued for a project that violated local zoning ordinances.[64] While the MPSC has preeminence over local zoning, development projects must still adhere to other state-level authorities. In rare cases, the MPSC has granted a CPCN before having to reverse the decision due to feedback from other state agencies. This scenario most notably occurred after the MPSC granted a CPCN to MD Solar 1 Project in 2018 only to have the Maryland Department of the Environment deny the project a Nontidal Wetlands and Waterways Permit, effectively killing the project.[65]

Despite multiple court decisions upholding MPSC's preeminence over local zoning, renewable siting remains a contentious issue. The development of utility-scale solar on agricultural land is particularly controversial. Regardless of MPSC's ultimate decision-making authority, some counties cite local bans on renewable development on agricultural land as a reason to deny CPCN applications. In one ongoing appeal, Carrol County argues that a ban on solar development on agricultural land passed by county officials in 2023 should be honored, despite acknowledging CPCN's preeminence over local zoning. In an interview with the *Baltimore Sun*, the county's Director of Land Management, Chris Heyn said: "That's [solar development on agricultural land] not up for discussion. We continue to maintain that stance. However, we're all well aware the state can preempt our local zoning through the Maryland Public Service Commission issuing a Certificate of Public Convenience and Necessity".[66] Interestingly, Maryland lawmakers have proposed seemingly redundant bills such as the now failed H.B. 1407, which would have prohibited counties from establishing zoning laws that restrict renewables development.[67] However, when considering cases like the one posed in Carrol County, such a law could prevent local authorities from creating new bans and prevent further appeals to the MPSC.

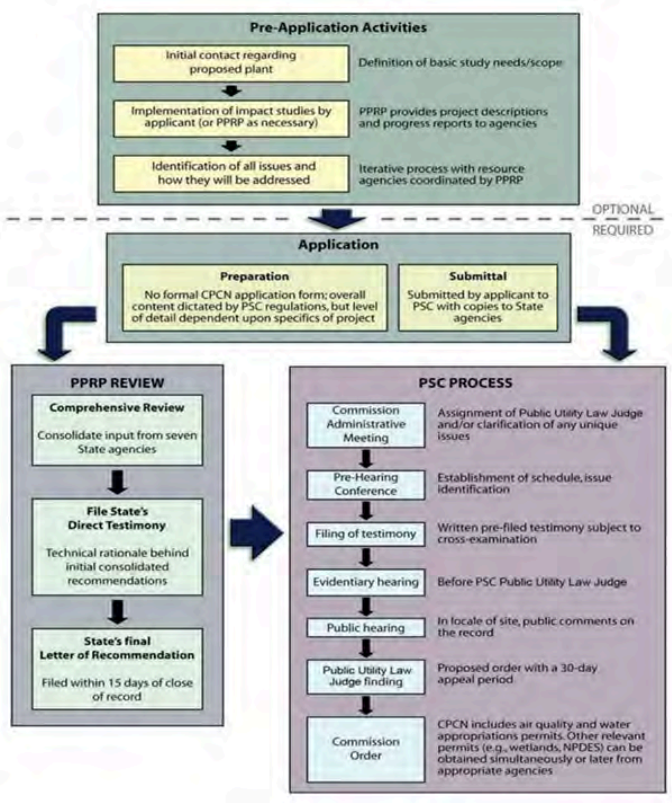


Figure 14 (reproduced). Overview of the CPCN Process[68]

Solar Energy Development

Solar energy development faces specific logistical challenges, particularly regarding land availability. Despite having a solar carve-out of 14.5% by 2028 (solar made up 4.84% of the electric grid mix in 2022), Maryland is attempting to minimize the loss of agricultural lands and forests by incentivizing solar siting on areas known as “brownfields”.[69] These incentives largely come from the Renewable Energy Development and Siting Task Force (REDS), established by Gov. Larry Hogan in 2020. In the 2020 legislative session, the REDS-supported S.B. 281 successfully passed the Maryland legislature, allowing for waiving the $6,000 application fee for development projects located on brownfield sites.[70] Brownfields, as defined by Maryland law are “1. A former industrial or commercial site identified by federal or state laws or regulations as contaminated or polluted; or 2. A closed municipal or rubble landfill regulated under a refuse disposal permit by the Maryland Department of the Environment”.[71] Unfortunately, most brownfields suitable for solar projects in Maryland are under one acre, which limits the feasibility of such developments, as solar production is directly proportional to the area occupied by solar panels.

However, a 2024 report headed by the Maryland Energy Administration (MEA) determined that 56 sites qualifying as brownfields were suitable for solar development, with a total potential solar capacity of approximately 760 MW (Maryland Environmental Science, 2024).[72] Should those 56 sites be fully developed, when considering Maryland's annual power consumption is roughly 16 TWh and factoring in Maryland's 25% average capacity factor for utility-scale solar, brownfield solar could provide roughly 2.5% of the state's electricity demand (US Department of Energy, 2024).[73] This means to effectively meet the 14.5% solar-carve out in 2028, along with Maryland's subsequent climate ambitions, utility-scale solar developments are needed and local communities in areas prime for development should familiarize themselves with the CPCN application process to ensure they can voice their opinions regarding projects in their area.

Onshore Wind Energy

Due to Maryland's relatively low wind speeds onshore, in-land turbines cannot provide a large portion of the state's energy generation mix. Maryland currently hosts approximately 190 MW of onshore wind capacity, almost exclusively located in its western regions. This is also reflected in state policy, where the only community wind incentive program launched in 2017 was allowed to expire in 2019 after just two years.[74]

Offshore Wind Energy Policy

Currently, there are two utility-scale offshore development projects off the coast of Maryland, MarWind, and Momentum, with another two, Skipjack I and II, on indefinite hiatus. Offshore wind siting in Maryland differs substantially from both solar and onshore wind. This is because Maryland's planned offshore development is hosted in federal waters. Because the proposed turbines fall under federal jurisdiction, the Bureau of Ocean Energy Management (BOEM) oversees the siting and permitting process, which encompasses everything from project conception through construction and operation. The siting process begins with BOEM releasing a Request for Interest (RFI) to notify potential developers that a generalized site for offshore generation will be available for lease. BOEM then assigns an "Intergovernmental Renewable Energy Task Force" to coordinate meetings with local, state, and tribal entities. At the same time, an environmental impact assessment is conducted to ensure the proposed development will not decimate the local habitat. Once both processes are cleared BOEM publishes a Final Sale Notice, confirming the dates and location of the lease. Once a developer is approved, BOEM reviews their construction plans, gives final approval, and continues to monitor the site throughout the life of the project.[75]

However, as the power generated from offshore sites must route to adjacent states, state-level authorities still have a part to play in offshore development. The MPSC is responsible for reviewing and awarding proposals submitted by developers to ensure projects adhere to state laws and do not adversely affect Marylanders.[76] MPSC's approval decisions for the MarWin and Skipjack projects primarily revolved around the business case for the projects rather than safety or environmental concerns, which fall into the jurisdiction of BOEM. MPSC's approval letter specifically states "the scope of our task is narrowly confined to considering

whether or not to award State incentives to the proposed offshore wind projects, and that other federal authorities will provide the Applicants with final authorization to construct and operate, our actions will facilitate and make possible the business case for the 2 Applicants to proceed in that process".[77] The decision goes on to cite job creation, favorable electricity rates for Marylanders, and strong community support as strong reasons to approve the projects.

Another consideration for the state is transmission requirements for new offshore projects. The Maryland Offshore Wind Energy Act of 2013 established that any offshore project that plans to run any submerged transmission lines must acquire a CPCN.[78] In practice this means all offshore projects will require a CPCN, since all offshore wind projects require transmission lines and non-submerged lines would be impractical and prohibitively expensive. Additionally, it should be considered if new transmission infrastructure or upgrades to existing structures will be required. In the case of MarWind and Skipjack, transmission considerations had not been finalized at the point of MPSC's approval due to their proposals being queued by PJM, the mid-Atlantic-based regional transmission organization (RTO).[79] It is also worth noting that both project proposals acknowledged financial responsibility to cover any needed new transmission upgrades or new facilities.

Recent Legislative Changes

Recent developments in Maryland's renewable energy landscape include the passage of the MS S 781 bill in 2023, which aims to enhance offshore wind project development and improve transmission facilities. The primary purpose of the bill is to enable the MPSC to request PJM to evaluate offshore proposals for potential requirements for significant transmission facility upgrades. Involving MPSC could help prevent bottlenecks that could develop when projects apply to be connected to the grid. Furthermore, the bill provides CPCN exemptions for projects that either undergo the PJM assistance process or projects that demonstrate a financial benefit to Marylanders when compared to a theoretical baseline scenario in which 8.5 GW of offshore wind is already connected to the PJM grid.[80] Essentially, the project must prove it is more advantageous in terms of costs, efficiency, or other measurable benefits compared to the alternative of independently connecting offshore wind projects to the grid.

Renewable Taxation

Maryland offers many incentive programs for renewable energy deployment across various technologies and scales (commercial, residential, and utility-scale). The programs are incorporated into federal, state, and local government policies. Until recently, the Maryland Clean Energy Production Tax Credit (CEPTC), first enacted in 2006, offered a tax credit of 0.85 cents per kilowatt hour for electricity generated by qualified resources. The eligible resources included wind, solar, hydropower, hydrokinetic, municipal solid waste, and biomass. The program also provided 0.50 cents per kilowatt hour for electricity generated from co-firing a qualified resource with coal. Credits could be claimed for a five-year period, with a maximum cap of $25 million for all eligible projects, and the qualified generators had to be in service on or after January 1, 2006, but before January 1, 2016. In May 2016, the program was amended to

extend the tax credit until December 31, 2018, as of S.B. 936.[81] Since then, however, CEPTC has ended due to limited funding allocation, advancements in renewable technology that had made its costs more competitive, duplication with the federal tax incentives, and state's programs that now focus on other forms such as grants, rebates, and financing mechanism, to emphasize its Renewable Portfolio Standard (RPS). Currently, Maryland offers tax exemptions and replacements for wind and solar development in utility-scale electricity generators.

Solar Tax Credit

In 2019, Maryland revised the taxation of solar energy plants. Prior to this, the Maryland tax code made it clear that any solar equipment, including to heat or cool a structure, was not subject to real property taxes. In 2019, it explicitly categorized solar photovoltaic property as personal property and made it eligible for obtaining a 100% property tax exemption with qualifications. The solar energy equipment or property must be in service on or after July 1, 2019, and before January 1, 2031, with a capacity exceeding 2 megawatts. This exemption does not apply to properties subject to any PILOT agreement entered into before July 1, 2019. Furthermore, the solar property owner or operator is responsible for paying an annual fee to the county, the amount of which depends on where the solar project is located. Solar photovoltaics that are located on farm or agricultural land are required to pay $2,500 per megawatt of capacity, while other areas are subject to pay $2,000 per megawatt of capacity. If the solar photovoltaic property is located within a municipality, $500 of the PILOT's payment shall be distributed to the municipality. [82]

In a push to increase community-scale solar installations, Maryland offers a range of tax exemptions that apply to projects under 5 MW. The state established the Community Solar Energy Generating System Pilot Program in 2015.[83] This program requires community solar to have at least two subscribers and a maximum capacity of 2 megawatts. To support this program, Maryland provides property tax exemption for community solar energy with requirements similar to those of the existing bills. New qualifications have been added, such as providing at least 50% of its energy to low-moderate income customers, producing costs at least 20% lower than the amount charged by the electric company, and installing on a rooftop, parking facility canopy, or brownfield. Applications for this tax exemption must be submitted before December 31, 2024.[84]

Senate Bill 860 updated the policy by introducing qualifications for agrivoltaics land, landfill, and clean fill. The property must be in service after June 30, 2022, and approved before December 31, 2025.[85] The recent bill (H.B. 1435) complements the existing bill by extending the eligibility period and adding new qualifications. It extends the eligibility period of community solar for personal property tax exemption from December 31, 2025, to December 31, 2030. The maximum capacity for this solar property is also increased from 2 megawatts to 5 megawatts per system.

Moreover, the bill also provides a state or local property tax exemption for nonresidential solar on rooftops or parking facility canopies. For solar parking facility canopies, counties or municipalities may reduce or eliminate local real property assessments for properties with a solar energy generating system on their parking facility canopy. The bill also introduces the ground-mounted solar property to be subject to the county real or personal property tax exemption, which can be either full or partial exemption if the owner and county enter a PILOT agreement, with a payment of $2,500 per megawatt of generating capacity. Furthermore,

counties and municipalities are given the authority to grant property tax credits for solar energy. Local governments have the discretion to define the qualifications for solar energy systems when determining eligibility for the credit.[86]

Wind Tax Credit

The tax treatment of wind energy projects in Maryland is similar to that of solar energy projects. The state provides exemption of wind projects from ad valorem property taxes and replacement of those taxes to payment in lieu of taxes. Historically, residential wind energy equipment is not subject to sales and use tax, and not subject to real property tax.[87] Maryland allows the local government to authorize payment in lieu of tax (PILOT) agreements with the wind energy developer. If the local government does not establish the PILOT agreement, the equipment for wind turbines will be assessed as personal property and receive a 50% exemption on its tax value.[88] One example of the county's contribution to supporting wind projects while developing its economy is Allegany County, which had a PILOT agreement with Clearway Energy Group in the Dan's Mountain Wind Project, allocating $10,000 annually in grants to support the local economy.[89]

Maryland also develops offshore wind through their program Promoting Offshore Wind Energy Resources Act (POWER) of 2023. Regarding the tax incentives that may apply to the future project, a developer of a Round 1 and Round 2 offshore wind project can apply to PSC to propose a full or partial exemption from statutory requirements. This exemption would allow the developer to pass along 80% of the value of any state or federal tax credit to ratepayers. However, the benefit cannot be included in the application for the IRA tax credits.

Energy Storage Tax Credit

Maryland provides a state policy to accelerate the usage of energy storage in residential or commercial renewable energy generators such as wind and solar. The program is a Maryland energy storage income tax credit (MESITC) that benefits taxpayers who install energy storage systems. The credit is 30% of the total investment cost of systems, up to $5,000 for residential and $150,000 for commercial properties.[90] The policy aims to increase the energy storage deployment because the current capacity has not increased since 2015 to about 10 MW. The policies addressed the residential and commercial scale and did not explicitly mention utility-scale energy storage. However, the maximum cap of $150,000 per commercial system seems insufficient for utility-scale energy storage projects which can involve multi-million dollar upfront cost investment. Therefore, the program appears to be more focused on small-scale systems to support distributed energy generation. Furthermore, the unclear PILOT agreements to energy storage may hinder the growth of this technology.

Renewable Energy Infrastructure Investment & Public Land Use Policy

Renewable Energy Infrastructure

When it comes to investment in renewable energy infrastructure the state of Maryland finds itself in a curious position. As outlined in the 2020 Governor's Task Force on Renewable Energy Development and Siting, Maryland has an extremely aggressive goal of 50% renewable energy electricity generation sales by 2028.[91] At the same time, however, Maryland has allocated very little money for supporting utility scale renewables generation or statewide transmission investment. As stated directly by grid operator Pennsylvania-New Jersey-Maryland Interconnection's (PJM) executive Jason Stanek in the October 7, 2024 Maryland Clean Energy Summit, "the state is one of a handful that does not have an overarching, holistic plan for infrastructure development to help guide the transition to clean energy…."[92] Supporting this, the Maryland Energy Administration's (MEA) 2025 executive budget indicates that for the past several years the MEA has awarded a substantial number of grants to support renewable energy development, but the majority of them go toward one of the state's enormously diverse Strategic Energy Investment Fund Programs – in this case the Clean Energy Rebate Program – which does not provide support for utility scale development.[93] Nearly half of the state's $200 million MEA budget is to be allocated for solar development, but at the level of community solar or smaller.[94] Much of the remaining funding goes toward energy efficiency initiatives rather than renewables development.

Looking beyond policy levers like direct subsidies, grants, or related funding opportunities for construction or operation of renewable energy infrastructure, Maryland also has a notable growing landscape of indirect investment in utility scale renewables. Differentiating existing from new renewable energy policy in Maryland is somewhat difficult given continuous evolution of the policy landscape over the past four years, but several recent bills have been signed into law that in some way aim to facilitate renewable energy technologies, including the SB469 2023 "Task Force to Study Solar Incentives"[95] and SB0960 2024 "Maryland Clean Energy Center –Climate Technology Founder's Fund."[96] SB469, while not itself allocating funds to invest in solar, did establish upon its passage by Maryland Governor Wes Moore in May 2023 a task force specifically to study, among other things, "the impact of solar grant programs, tax credits and exemptions, classification of solar energy property for assessment purposes, solar renewable energy credits, and other financial incentives… [for solar]," clearly in preparation for possible (though not guaranteed) future investments.[97] SB0960, passed by Governor Moore in May 2024, establishes a dedicated fund of just over $1.7 million for the express purpose of "provid[ing] early-stage funding for start-up companies focused on qualified projects in climate technologies" including solar, wind, grid modernization, energy storage, and other technologies.[98]

Much like renewable energy infrastructure, Maryland has allocated little direct funding for supporting electric transmission infrastructure, being referred to as "…a state where

transmission has come to die" by the aforementioned PJM executive Jason Stanek.[99] Once again, however, that doesn't mean the state has been idle on related policy, as exemplified by Maryland HB1393 2024 "Electric System Planning – Scope and Funding"[100] passed by Governor Moore earlier this year. While the scope of the bill expanded from a specific focus on electric distribution systems to electric systems in general in Maryland, it nonetheless requires the state's energy commission to provide assistance to energy companies in Maryland by supplying information on any state or federal funds for improving the efficiency, reliability, and resiliency of the Maryland Grid.[101] In addition, it is worth noting the existence of another bill, Senate Bill 0920 2024, which would have created a state electric transmission authority, although it was withdrawn by its sponsor in the state senate only a month after initial introduction.[102] Maryland also recently joined a Memorandum of Agreement on Interregional Transmission Planning with 9 nearby states[103] facilitated by the US Department of Energy which convened working groups from each of the participating states.[104] Finally, no discussion of Maryland transmission infrastructure would be complete without discussion of the highly controversial Maryland Piedmont Reliability Project, or MPRP. MPRP Is a proposed energy transmission infrastructure project consisting of ~70 miles of new high voltage distribution lines running through Baltimore, Frederick, and Carroll counties in Maryland.[105] While supporters of the project point to reliability and cost savings for energy consumers in Maryland, opposition is strong due to the potential impact on farmland, preserved land, and cultural sites that are in the proposed system path.[106] Following from this stiff opposition, there is a planned (though not yet introduced) bill to halt progress on the Maryland Piedmont Reliability Project (MPRP), until after an investigation from a state MPRP task force conducts a more detailed impact analysis.[107]

Use of Public Land

The possible use of public land for renewable energy development is generally unaddressed and lacks almost any acknowledgement in recent Maryland state-level policies pertaining to renewable energy—with the quite notable exception of offshore wind energy. Before moving to offshore wind, a small but notable land-based renewable energy development is not a policy per se, but simply the existence of a decade-old, 20MW solar farm surrounding a state prison in Hagerstown, MD.[108] Additionally, zooming out to the federal level, the proposed 2024 HR9012 "Public Land Renewable Energy Development Act" could, if signed into law, have future implications for renewable energy development on the small swaths of federal land found in Maryland, as the bill has the explicit purpose of "promot[ing] the development of renewable energy on public land, and for other purposes."[109]

Turning to offshore wind energy, however, the story in Maryland is quite different, with enormous energy potential, meaningful policy development, and slow but ongoing progress toward real, large-scale, energy producing offshore infrastructure. The story begins with the Maryland 2013 Offshore Wind Energy Act's "Offshore Wind Development Fund," which established $30 million to cover various development costs associated with offshore wind in Maryland.[110] Perhaps the most notable recent policy in context is SB0781 2023 "Promoting Offshore Wind Energy Resources Act."[111] SB0781, passed by Governor Moore in April 2023, establishes provisions for an astonishingly large state power purchase agreement "up to

5,000,000 megawatt-hours annually of offshore wind energy and associated renewable energy credits from one or more qualified offshore wind projects."[112]

Given the general lack of growth or investment in solar or onshore wind at scale, traditional community engagement with facility planners has not been as much of an issue as in other states—that is, with the again very notable exception of offshore wind. The recent news of a joint lawsuit filed in October 2024 by local government and community groups against a planned 30-gigawatt offshore wind facility points to the timeliness of the state's policies for community engagement and CBAs found in SB781 alongside the sections on a possible state power purchase agreement: "the lawsuit, filed by Ocean City, Worcester County, and various community groups, highlights a crucial oversight in project development: the failure to build what researchers call a 'chain of trust' in local communities."[113]

III. CONCLUSION

Maryland's renewable energy policies are underpinned by ambitious goals, including achieving 50% renewable energy by 2030 and net-zero emissions by 2045. However, a deeper analysis reveals a complex policy landscape that both facilitates and hinders renewable energy deployment. This section examines how current policies align (or fail to align) to support utility-scale solar and wind development and highlights potential opportunities for policy improvement.

Utility-Scale Solar Policy Analysis

There are many areas of positive support for utility-scale solar development in Maryland. First, they offer many different incentives for development including both tax incentives and an RPS. Maryland provides significant tax exemptions for utility-scale solar installations, including property tax exemptions and Payment in Lieu of Taxes (PILOT) agreements. For instance, solar photovoltaics exceeding 2 MW are eligible for full property tax exemptions, reducing upfront costs for developers. Next, the Renewable Energy Portfolio Standard (RPS) mandates a solar carve-out of 14.5% by 2030, creating a market for Renewable Energy Credits (RECs) that incentivizes solar adoption. Next, in terms of land development, brownfields present a unique opportunity in Maryland and there are policies to support it. These include policies that promote solar installations on brownfields, such as the waiver of application fees and priority siting incentives to help mitigate land-use conflicts. Brownfield sites offer an estimated potential capacity of 760 MW, which is a massive opportunity given the lack of public land available for solar development.

On the other side, there are factors working against Maryland and its lofty renewable energy goals. First, approximately one-third of Maryland's land is dedicated to agriculture, and local opposition to converting farmland for solar projects is significant. Recent cases, such as Carroll County's ban on solar development on agricultural lands, highlight the disconnect between state and local priorities. Although the MPSC has preemptive authority over local

zoning through the Certificate of Public Convenience and Necessity (CPCN) process, local resistance continues to delay projects. This forceful opposition will make it challenging for Maryland to deploy utility-scale solar with the speed and scale necessary to meet its climate goals. Next, many of the state policies tend to prioritize residential and community solar over utility-scale projects. While this is a beneficial component to the energy transition, this focus does not address the scale required to meet state targets. Maryland will need to pivot its focus to larger-scale installations in order to deploy at the scale needed. Lastly, Maryland lacks a comprehensive plan for upgrading transmission infrastructure to support utility-scale solar. This gap limits the ability of large projects to connect to the grid efficiently. While most of the transmission requirements center on offshore wind projects, the transmission needs for large-scale solar cannot be underestimated or forgotten.

Utility-Scale Wind Policy Analysis

As with utility-scale solar, there is a lot of positive policy support for utility-scale wind in Maryland. Most of this support is for offshore wind since the state has a lot of offshore wind potential that has not been tapped into yet. The POWER Act sets a goal of 8,500 MW of offshore wind by 2031. This policy facilitates large-scale projects like MarWin and Momentum Wind, which could collectively meet 25% of the state's electricity demand. This policy also reiterates the state government's support for offshore wind development and their confidence in its potential. In addition, Maryland's engagement with the Bureau of Ocean Energy Management (BOEM) ensures coordination in federal waters, streamlining permitting processes for offshore projects. Next, offshore wind developers can apply for tax exemptions, which further reduces project costs. For example, current policies allow for PILOT agreements, providing predictable costs while supporting local economies. Lastly, the most recent RPS mandates specific offshore wind targets, which then strengthens the potential market for Offshore Renewable Energy Credits (ORECs). This aligns state goals with market mechanisms, fostering investment confidence.

On the flipside, there are many obstacles to utility-scale wind development. Utility-scale wind projects in Maryland are largely potential offshore wind projects. This is mainly because onshore wind development is limited by geography, with many of the viable sites restricted to western Maryland. The expiration of the state's community wind incentive program in 2019 further diminishes opportunities for inland projects. There is also a lot of local opposition, often rooted in concerns over noise, aesthetics, and environmental impacts, making the pathway for onshore wind that much more challenging. While onshore wind is limited, that does not mean offshore wind is not. One of the largest barriers to development of these proposed offshore wind projects is their high financial cost. Shown by a few recent financial withdrawals, such as Ørsted's decision to halt the Skipjack projects, underscore the volatility of offshore wind investments. Rising costs threaten project viability despite strong policy backing. Finally, one of the largest obstacles to offshore wind development is the inability of the current transmission system to support it. Offshore wind projects would require substantial upgrades to Maryland's transmission infrastructure, which are currently underdeveloped. While there are policies supporting project feasibility studies to be completed with PJM, this process is time consuming

and will further push out development, making it challenging for Maryland to meet many of its ambitious targets.

Opportunities for Policy Improvement

One major opportunity for better policy support for utility-scale solar would be enhanced land-use policy. Maryland needs more clear statewide standards for siting utility-scale solar projects, emphasizing dual-use strategies like agrivoltaics to balance agricultural preservation concerns with renewable energy goals. It could also reduce delays to the CPCN process by passing legislation that prohibits creation of local bans of utility scale renewables on agricultural land. Next, Maryland could enhance their incentive structures to include utility-scale projects in their broader incentive structures, ensuring parity with community and residential projects to encourage large-scale development.

For utility-scale wind projects, Maryland could focus on strengthening the financing mechanisms for these projects. Many projects have been halted, but the establishment of state-backed guarantees or green bonds to mitigate financing risks for offshore developers would help support project development while reducing the number of projects that aren't seen through all the way. With the POWER Act, Maryland is making progress, but there is room to further incentivize given the necessity of offshore wind in meeting their energy targets. Next, despite the high amount of offshore wind potential, Maryland should relaunch community wind incentive programs and explore hybrid models combining wind with solar or battery storage to optimize use of limited inland resources. There is a lot of risk when relying too much on offshore projects, so Maryland should focus some policy development on supporting onshore wind projects. Lastly, Maryland should continue to focus on and advocate for transmission upgrades. While the MPSC is working with PJM to understand the needs of the grid and the potential enhancements, Maryland should leverage other federal funds and regional partnerships to accelerate the process. Given that PJM is known to be slow to work with, it will be important for Maryland to work with other partners to keep the process moving forward as much as possible.

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