

Enhancing Maryland's Renewable Portfolio Standard

How Wind and Solar Prevail in the State's Renewable Portfolio Standard

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Renewable Portfolio Standards Are Working

Maryland's Renewable Portfolio Standard (RPS), along with similar policies in nearby states, is succeeding in its goal of promoting the build-out of renewable energy resources. Synapse analysis shows that in the region covered by the PJM Interconnect electricity grid, RPS policies have the direct effect of boosting renewable energy installations. This is due to the vast amounts of renewable resources still untapped in the region that are unlikely to be developed within the next 15 years without the demand created by RPS policies. In light of this success, Synapse explored three separate expanded RPS options for Maryland to determine how various renewable energy options fit into the overall picture through the year 2030. Table 1 shows the options we modeled.

Maryland's RPS Can Include More PV and Eliminate Emitting Resources at Little Cost

Synapse analysis found that Maryland was able to attain its RPS standard at little cost in all three of the options analyzed. Not only are there enough renewable energy resources generating tradable renewable energy credits (RECs), the current and future costs of wind and solar are such that an expansion of Maryland's RPS will not result in substantially higher prices for customers.

So, what are the differences in the three options? In terms of costs, it turns out not much. The continuously decreasing costs of wind and solar resources push other RPS renewable resources to the sidelines, primarily the emitting resources described on the next page. As a result, these sidelined resources have little impact on cost-effective compliance. In addition, their development is neither helped nor hindered in any significant way by Maryland's choice of RPS policy because their success hinges on so many other factors.

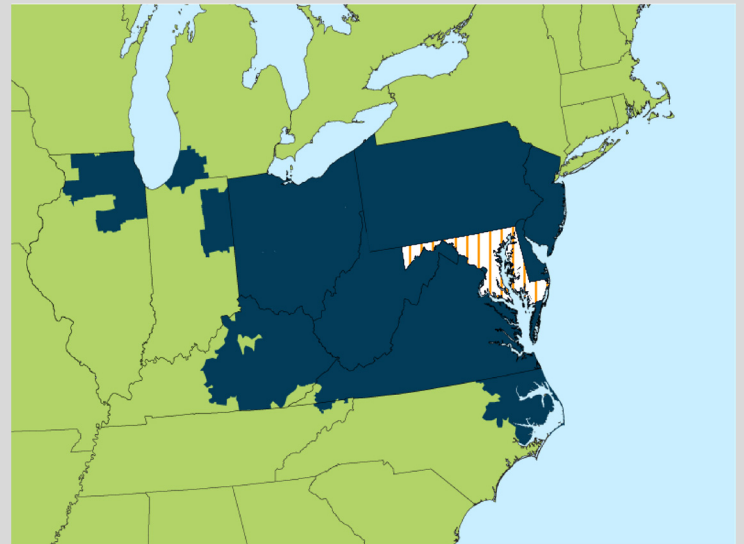


Figure 1. Maryland, in white, shares an electricity grid with the rest of the PJM Interconnect region, in dark blue.

RPS Policies Modeled	Increase Overall Requirements	Increase Solar Carve-out	Remove Emitting Resources
Current			
Option 1	✓	✓	
Option 2			✓
Option 3	✓	✓	✓

Table 1. RPS options modeled by Synapse.

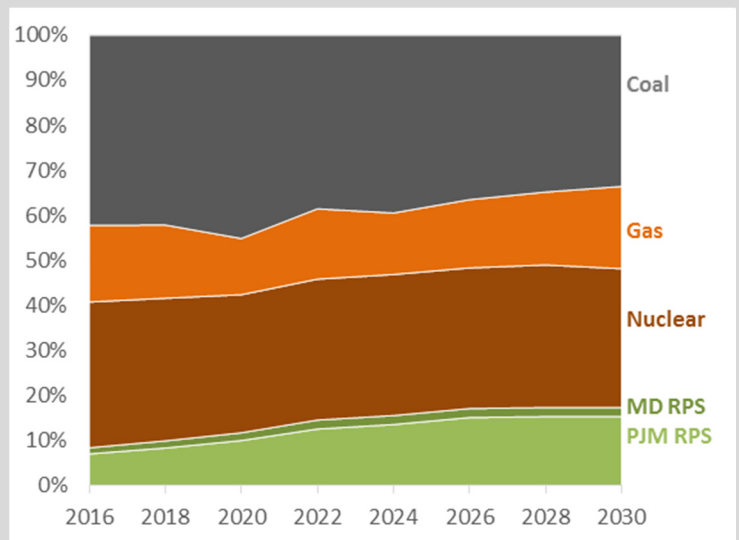


Figure 2. Forecasted PJM electric generation with current Maryland and other PJM state RPS policies.

The Real Story is Wind and Solar

Between now and the late 2020s, onshore wind is the cheapest RPS resource on a \$/kWh basis across PJM. In 2020, the cost of energy from onshore wind resources is expected to be \$51 per megawatt-hour. Importantly, there's far more than enough wind potential to meet the region's RPS requirements, meaning this will be the go-to resource as long as it's most cost-effective.

For the time being, offshore wind costs more than onshore wind, and Synapse included only enough in the model to meet the Maryland RPS offshore wind requirement.

By the late 2020s, annual solar PV installations will have joined and possibly surpassed new onshore wind installations, due to decreasing costs. The estimated cost of energy from solar PV in 2020 is \$88 per megawatt-hour, and is projected to continue decreasing from there.

What About Other Renewables?

Maryland's current RPS allows for a wide range of renewable resources, which can be divided into greenhouse gas emitting resources and non-emitting resources (see Table 2).

The markets and technologies for several of these resources (such as ocean-based generation) have not yet

Non-Emitting Resources	Emitting Resources
MD: Offshore wind	MD: Poultry litter
MD: Geothermal	MD: Municipal solid waste
MD: Solar PV & solar thermal	Black liquor (waste from manufacture of paper & pulp)
Onshore wind	Landfill gas
Small hydropower	Other biomass
Ocean-based	

Table 2. Emitting and non-emitting resources under Maryland's current RPS. "MD" indicates resource must be in state.

matured enough to be cost effective through the 2030 time period and thus do not play a significant role. Some resources such as small hydropower or geothermal lack adequate resource availability, while the cost of others remains high despite a mature market (e.g. thermal solar).

Still other resources, primarily those based on waste-to-energy technologies, are prone to a host of project-specific challenges that have little to do with broader economic conditions and thus distance them from the RPS policy impacts.

Modeling's Economic Constraint

Synapse used an adapted version of the Regional Energy Deployment System (ReEDS) model developed by the National Renewable Energy Laboratory to determine which resources would be used by the regional grid over time based on cost, potential, and RPS policy. It does not model the numerous other factors that can determine whether or not a resource is developed.

These other factors—siting issues, non-RPS subsidies, political priorities, pollution, and other environmental concerns—often have a much greater impact on whether or not a resource is developed than an RPS policy would have. For this reason, Synapse did not model future expansion of these resources and instead included only projects that already exist or are likely to be built.

For instance, we found only one new municipal solid waste proposal, which is now foundering after losing most of its sales contracts over environmental concerns. With an already marginal economic outlook, municipal solid waste projects seem unlikely to play a big role in meeting Maryland's RPS.

To read the full report on how Maryland can meet an expanded RPS cost-effectively, go to www.synapse-energy.com/Meeting-Marylands-RPS.

ABOUT SYNAPSE

Synapse Energy Economics, Inc. is a research and consulting firm specializing in energy, economic, and environmental topics. This factsheet and the accompanying report, "Meeting Maryland's RPS," were prepared for the Maryland Climate Coalition.

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