Comments on Maryland's RPS Interim Report

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I. General

The Interim Report is a reasonably thorough but selective report. There are a number of places where the report is good, but there are several issues that need to be addressed that are not addressed. These include costs, and what is really being assumed about technologies. The true objective for the report is to provide a totally neutral analysis, not one that appeases renewable energy advocates but sweeps problems under the rug, to be dealt with later. The Interim Report as written does not achieve that objective.

The comments below are largely critical, but again, this is to point out areas the Interim Report should address. What it does, the Interim Report largely does well, with a few exceptions. In particular, the statement made on p. 13 that the PJM study does not include analysis of the distribution system, as opposed to transmission, is excellent. The Energy Information Administration (EIA) reports in its latest Electric Power Monthly, in Table 6.2.B. Net Summer Capacity Using Primarily Renewable Energy Sources and by State, November 2018 and 2017 (Megawatts) (online at https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_6_02_b) that Maryland has 1,161.8 Megawatts (MW) of Primarily Renewable Capacity, of which 708.8 is Small Scale Capacity. So the distribution system will be a key factor in how Maryland can cope with the Renewable Portfolio Standard (RPS).

II. Other Specific Comments

i) The Interim Report never mentions the intermittent nature of the renewable sources as a key problem in dealing with the RPS, or what is being considered to deal with it, except for storage systems, of which more below. In the same Electric Power Monthly, and previous issues, EIA reports the following for renewable *generation*:

Month	Generation (in Thous. MWH)
Nov-18	114
Nov-17	107
Jul-18	126
Jul-17	119
Jan-18	118
Jan-17	99

This is utility-scale generation, from EIA Electric Power Monthly Table 1.11.A. Utility Scale Facility Net Generation from Renewable Sources Excluding Hydroelectric. So this variability is understating the problem.

The non-intermittency, or put another way, the high capacity factor, of Calvert Cliffs, on p. 94, should be listed as an advantage. No capacity factors are mentioned in the Interim Report at all.

ii) The Interim Report assumes a very high rate of growth for utility wind and solar. There is no explanation of why this growth should be so high except to meet the RPS requirements. Some sort of economic explanation of what is going to happen to justify this beyond "technology will improve" should be given.

iii) An example of the high degree of optimism regarding technology is on pp. 25-26:

"For instance, even after the expiration of the federal III-7 production tax credit (PTC), incremental growth in onshore wind capacity could be higher than the projected 50 percent decline in capacity relied upon in the 2017 Inventory Report, based on improved performance and economics of wind power technology."

Exactly how is this going to come about? How will this be affected by tariffs? Who will supply the new technology? What technology will be involved?

These are not abstract issues. An example of what can go wrong is the attempt by General Electric (GE) to develop fabric-based wind turbine blades. This was financed by ARPA-E, and a description of the project is at

https://arpa-e.energy.gov/?q=slick-sheet-project/fabric-based-wind-turbine-blades

The project was cancelled, and there is no information from GE that tells whether the research has been continued, or whether it would be resumed if not under any particular conditions.

iv) The Interim Report focuses on PJM resources, and that may have been due to its mandate. But non-PJM resources might be of considerable value to Maryland in meeting the RPS requirement at low cost and at high reliability. For example, suppose it was decided to build a pumped storage facility in West Virginia, to serve as backup for the intermittent renewable resources the Interim Report assumes will be found for Maryland. How would the costs of such pumped storage compare to the other options the Interim Report considers? Is it worthwhile for the state to consider this?

v) The Interim Report does consider storage, on p. 72, and is very optimistic on storage costs. There are two aspects of this optimism that deserve a much fuller analysis:

a) If we are going to stick to lithium-ion or other standard batteries, the University of Michigan Battery Lab (see https://energy.umich.edu/research/battery-lab) is already performing such research. What value is there in trying to do the same or very similar research in Maryland?

b) Suppose we go further, and consider ionic liquids as a possible battery technology. Monash University and the Toyota Research Institute have developed a borane-based ionic liquids electrolyte system for batteries. See

https://www.greencarcongress.com/2018/11/20181101-trina.html

Would further work on such batteries in cooperation with these groups be advantageous to Maryland? Can such cooperation at least be mentioned within the scope of the Interim Report?