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SUBMITTED ELECTRONICALLY VIA EMAIL

July 26, 2019

Mr. Kenneth Jurman
Department of Mines, Minerals and Energy
1100 Bank Street, 8th Floor
Washington Building
Richmond, VA 23219

RE: Comments in response to draft Virginia energy storage study

Dear Mr. Jurman,

The U.S. Energy Storage Association (ESA) respectfully submits these comments to the Virginia Department of Mines, Minerals and Energy (DMME) and the Virginia Solar Energy Development and Energy Storage Authority (VSEDA) on the Commonwealth of Virginia Energy Storage Study (Draft Report) by Strategen Consulting.

ESA is the national trade association dedicated to energy storage, working toward a more resilient, efficient, sustainable and affordable electricity grid – as is uniquely enabled by energy storage. With more than 180 members, ESA represents a diverse group of companies, including independent power producers, electric utilities, energy service companies, financiers, insurers, law firms, installers, manufacturers, component suppliers and integrators involved in deploying energy storage systems around the globe.

ESA applauds the DMME and VSEDA for undertaking this important study to arm decision-makers in the Commonwealth with the necessary analytical foundation to advance energy storage policies that will break down the regulatory and market barriers for energy storage. In these comments, ESA highlights several modeling assumptions likely to have underestimated the level of deployment which would have provided a net benefit to the Commonwealth. Additionally, ESA respectfully suggests several recommendations for modifications to the report, including the Market Barriers to Energy Storage Deployment in Virginia (Chapter 5) and Recommendations & Policy Actions (Chapter 6).

I. Comments on Report Assumptions and Modeling

The Draft Report provides an important starting point for discussions about energy storage in the Commonwealth. The modeling exercise conducted for the report demonstrates that 1,000 MW of energy storage deployment by 2030 would provide net benefits to the Commonwealth. While Strategen notes that these estimates are likely to be conservative, ESA is concerned that this initial modeling exercise significantly underestimates the levels of storage deployment that could provide net benefits to the Commonwealth's residents and businesses. There are three critical areas that were not sufficiently included in this Draft Study that, if addressed, would likely increase the system-wide value of energy

storage for the Commonwealth: (1) the value of storage as a more cost-effective alternative to natural gas peaking plants, (2) storage as a non-wires alternative to traditional transmission investment, and (3) the capacity value of storage in wholesale markets. In the comments below, ESA highlights these three areas of benefit and provides recommendations for how to address them in the final report.

(1) Study Assumes No Storage Displacement of Planned Combustion Turbine Plants

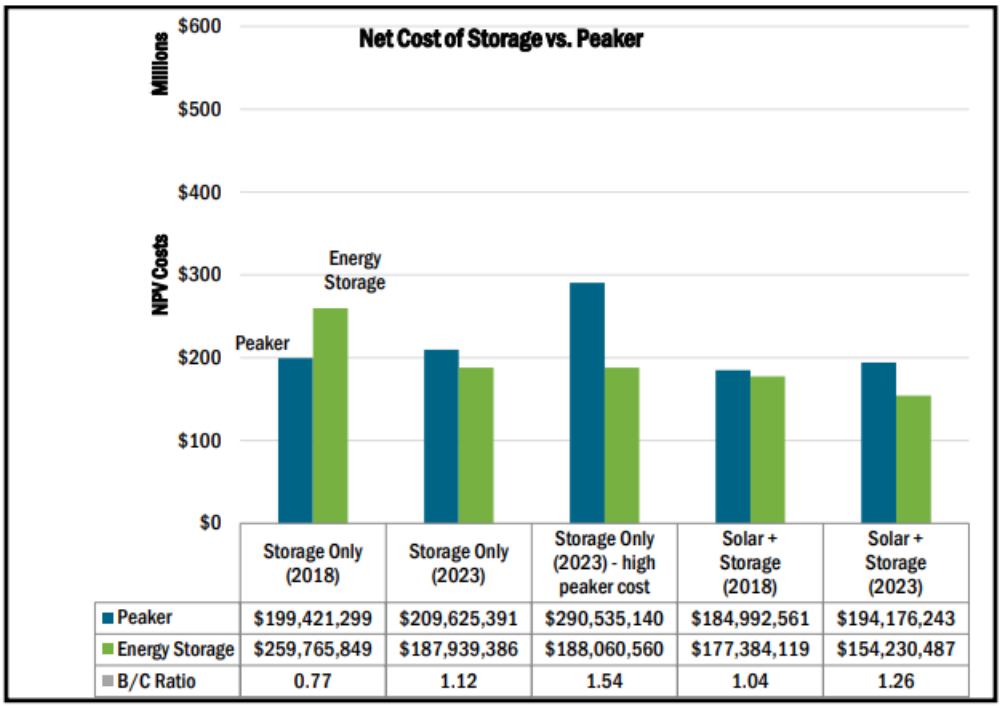
While the study included important modeling on both the distribution and bulk system, it does not include a modeling exercise comparing energy storage to traditional natural gas peaking plants. In fact, the study assumes that the approximately 2,700 MW of combustion turbine peaking capacity under consideration by Dominion will be built. Energy storage has already been deployed across the U.S. as a more affordable and efficient alternative to traditional natural gas peaking capacity. In fact, across the U.S., energy storage systems are outcompeting new natural gas plants even without the inclusion of expected additional value streams that energy storage assets can capture when not being used to meet peak demand, and without monetizing the value of mitigating risk of natural gas price volatility.

ESA is concerned that given the absence of peaking plant displacement analysis and modeling in this Draft Report, the potential deployment levels of energy storage for the Commonwealth are significantly undervalued. The energy storage cost assumptions for 2030 and the assumptions for natural gas new build would indicate that energy storage could very well be the most cost-effective alternative to the proposed natural gas peaking plants in many instances. Strategen authored two important reports that undertook this type of modeling for Minnesota and New York City.[1] The graphic below shows the findings of Strategen's report in Minnesota, demonstrating that standalone energy storage under various scenarios is the more affordable solution over the coming decade.

ESA Recommendation: *ESA suggests amending the report to include discussion of the potential for energy storage to be a cost-effective alternative to a peaking plant, referencing the important work Strategen has already done in Minnesota and New York City. Furthermore, if the analysis cannot be done within this scope of work and time frame, a recommendation should be made that stakeholders should explore ways to support additional analysis to expand this initial modeling exercise to better reflect the benefits of energy storage for the Commonwealth.*

[1] Strategen Consulting, "Modernizing Minnesota's Grid: An Economic Analysis of Energy Storage Opportunities," July 11, 2017, available at: http://energytransition.umn.edu/wp-content/uploads/2017/07/Workshop-Report-Final.pdf.

Strategen Consulting, "New York City's Aging Power Plants: Risks, Replacement Options, and the Role of Energy Storage," September 20, 2017, available at: https://static1.squarespace.com/static/571a88e12fe1312111f1f6e6/t/59c3d46ae9bfdf16412f8b7e/1506006147665/Strategen+-+NYC+Power+Plants+and+Energy+Storage+9.20.2017.pdf



	Storage Only (2018)	Storage Only (2023)	Storage Only (2023) - high peaker cost	Solar + Storage (2018)	Solar + Storage (2023)
Peaker	$199,421,299	$209,625,391	$290,535,140	$184,992,561	$194,176,243
Energy Storage	$259,765,849	$187,939,386	$188,060,560	$177,384,119	$154,230,487
B/C Ratio	0.77	1.12	1.54	1.04	1.26

Figure 3. Summary results for cost comparison of energy storage to natural gas peakers. With the exception of the storage-only project in 2018, all projects including storage are more cost-effective than comparable gas-fired peakers.

(2) Study Excludes Storage-as-Transmission Value in Net Benefits

The report rightly notes that energy storage can facilitate a cost-effective deferral and avoidance of transmission build out. This is particularly important in the context of energy storage potential in the Commonwealth of Virginia, since Dominion has previously described plans to invest approximately $4.3 billion in transmission investments. The ability of energy storage to serve as a cost-effective alternative to traditional transmission lines is immensely important as the state considers the potential for energy storage.

ESA Recommendation: *Include further discussion of the potential for storage-as-transmission and include in the recommendation section additional analysis on the potential for storage to meet some of the $4.3 billion in transmission investments identified by Dominion. While the regulatory barriers section explores some of these issues, it should be complemented by a clear policy recommendation to reform transmission planning and approval.*

(3) Wholesale Market Assumptions Likely Undervalue Storage

The Draft Report's capacity value is determined through the ability of energy storage to participate in the PJM market. Understandably, the modeling exercise assumed that PJM's proposed rules requiring that storage assets can provide a sustained output for at least 10 hours would be implemented and remain in place through 2030. ESA has been arguing against this requirement at the Federal Energy Regulatory Commission (FERC) and has recently released a study debunking PJM's case for such a

requirement.[2] ESA respectfully suggests that assuming a 10-hour requirement is in place for the next decade is unlikely. While ESA can appreciate that the challenges of modeling rules under development, we propose that there is a very low likelihood that these requirements remain in place for the next 10 years, if at all. As such, the capacity value on the wholesale market for energy storage in the Draft Report largely undervalues energy storage.

ESA Recommendation: *Consider revising modeling to include a sensitivity scenario where the requirement would only be between 4 to 6 hours to show a spectrum of potential capacity value (and overall storage potential).*

II. Comments on Regulatory Barriers & Recommendations

In the Draft Report, Strategen Consulting has provided a thoughtful initial description of the regulatory barriers in the Commonwealth and the policy recommendations needed to overcome them. ESA supports many of the recommendations that have been put forward, most notably: (1) set a clear and long-term energy storage target, (2) reform of the integrated resource planning and procurement process, (3) update distribution interconnection rules, and (4) develop a pathway for non-wires alternatives. Below, ESA provides the following recommendations for enhancements to the discussion of barriers and policy recommendations.

(1) Additional Information is Needed on Storage Target Recommendation

ESA agrees with the Draft Report recommendation that the state consider an energy storage target based on a robust modeling exercise. We anticipate that with revisions in the modeling discussed above, the overall number will far exceed 1,000 MW by 2030. Notably, ESA recommends that additional discussion be included in the Draft Report to provide decision makers with an understanding of how an energy storage target can be incorporated in the Commonwealth. Specifically, ESA notes that an energy storage target can easily be incorporated into a state through an existing IRP process. In fact, Arizona and Nevada are both considering draft regulations that would include an energy storage target or goal in the IRP process. An energy storage target built into an IRP and Distribution Resource Planning (DRP) process provides the utilities with a clear policy signal as they model scenarios ensuring the resource meets a demonstrated need in a cost-effective manner. Additionally, ESA recommends that the target recommendation include a discussion of the benefits of including sub-categories within the target, whether by point of interconnection, application, or both (e.g. distribution connected, standalone storage).

ESA Recommendation: *Revise the target recommendation to incorporate discussion of sub-categories within a target and how a target can fit into the IRP rules.*

(2) Prudency Determination Just as Important as IRP Reform

The Draft Report rightly underscores the need to initiate a review of the IRP regulations to better capture the emerging best practices that will ensure a level playing field for storage and other emerging

[2] Astrapé Consulting report commissioned by the Energy Storage Association and National Resources Defense Council, *Capacity Value of Energy Storage in PJM*, July 2019, available at: http://energystorage.org/system/files/resources/astrape_study_on_pjm_capacity_value_of_storage.pdf and ESA policy brief available at: http://energystorage.org/system/files/attachments/policy_brief_-_astrape_study_2019.7.15.pdf

technologies in the utility planning process. The report also rightly notes that all procurement for a specific need should be technology-agnostic rather than issuing a request for proposals (RFPs) for specific technologies. However, given the context in Virginia, revising the planning process is not in and of itself sufficient to ensure that storage and other alternatives are considered seriously when power plants or transmission and distribution lines are being proposed at the Commission. Revisions to prudency determination requirements at the Commission are just as important as the revisions to the modeling and must include a more robust demonstration of the alternatives analysis.

ESA Recommendation: *Revise the Integrated Resource Planning and Resource Procurement section of the recommendations chapter to include a proposal that prudency determination rules at the Commission be revised to ensure that when investments are proposed, there is an adequate showing of alternatives analysis.*

(3) Further Discussion is Needed on Pumped Storage

The Draft Report rightly recognizes that meeting the Commonwealth's energy and grid needs will require a variety of energy storage technologies, including pumped storage resources. To that end, the Draft Report recommends facilitating the deployment of pumped storage resources in Southwest Virginia. ESA agrees that utilizing geographically viable resources is important in the selection process, but respectfully suggests that decision-makers would benefit from further analysis to understand how all storage technologies fit into the Commonwealth's grid future, across the entire Commonwealth. Most importantly, this should include a description of what types of applications and system needs pumped storage and other energy storage technologies can address.

ESA Recommendation: *Provide additional information on the types of applications that pumped storage and other energy storage technologies are able to provide, and where possible, identify which of the applications identified in the report as critical can be met with which technologies.*

I. CONCLUSION

ESA appreciates the opportunity to provide these comments to the DMME and VSEDA to support the completion of the Energy Storage Study. We commend Strategen Consulting for providing a thoughtful initial document for stakeholders to build upon, particularly given the time and resource limitations. We look forward to working with all the stakeholders in driving additional analysis and discussions in order to realize the deployment potential of energy storage in the Commonwealth of Virginia.

Respectfully,

Nitzan Goldberger
State Policy Director
Energy Storage Association