BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF POSSIBLE MODIFICATIONS TO THE ARIZONA CORPORATION COMMISSION'S ENERGY RULES	**Docket No. RU-00000A-18-0284**

COMMENTS OF THE ENERGY STORAGE ASSOCIATION

Pursuant the Arizona Corporation Commission's ("Commission") Staff's request for written comments and proposed language to Docket Number RU-00000A-18-0284 on February 28, 2019, ESA respectfully submits these comments for the consideration of the Commissioners and Commission Staff ("Staff").

ESA appreciates the opportunity to provide comments on modifications to the Commission's energy rules, and specifically proposals introduced by Commissioners Kennedy and Tobin. ESA shares the Commission's concern that updates to existing energy rules are required to reflect the immense technological changes that have taken place over the past decade, and the State of Arizona's interest in driving a transition to a low-carbon and more efficient electric grid. The Commission's decision to impose a moratorium on the construction of new natural gas plants until August 1, 2019, reflects the Commission's commitment to conduct a rigorous review of existing rules before proceeding with investments carried by ratepayers. This commitment is also apparent in Commissioner Kennedy's and Commissioner Tobin's ongoing effort to bring this topic to the top of the Commission's agenda. The looming deadline of the

Commission's moratorium on new natural gas plants requires expeditious action on these reforms. Given the stakeholder engagement process that has led to a robust public record on the subject, ESA contends such action is achievable on that timeline.

ESA applauds the Commission for engaging stakeholders over the last several years on reforming the existing energy rules to better reflect the changing system needs and availability of technologies. ESA provided comments in February 2018 to Staff's previous request for comments on the Energy Modernization Plan proposed by Commissioner Tobin. ESA appreciates the opportunity to continue to provide information and input to the Commission and Staff in this docket. In our comments today, ESA provides a recommended framework for incorporating energy storage in to a broader clean energy plan. The framework includes three critical components: (1) a storage deployment target that will ensure the infrastructure is in place to support the Commission's clean energy objectives, (2) programs to ensure the realization of the target, including market-based solutions and incentives, and (3) reforms to utility and grid planning rules to ensure energy storage is adequately considered next to traditional investments.

I. ABOUT THE ENERGY STORAGE ASSOCIATION

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 170 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.

II. RESPONSE TO STAFF QUESTIONS

ESA commends the Commission focus on ensuring the least-cost, best-fit portfolio of generation resources and grid infrastructure assets are deployed to enhance Arizona's electric system. Energy storage is complementary to any portfolio of resources, regardless of the grid's carbon content, due to its ability to make the grid more flexible and affordable. Energy storage enhances resilience to withstand or recover from extreme weather conditions, particularly through deployment at the distribution level. Storage can also significantly reduce the need for spare generation capacity to meet peak demand and save ratepayers the expense of carrying the burden of underutilized assets.

Storage also supports different state policy objectives, such as reducing carbon emissions through the increased penetration of renewable energy resources and reducing dependency on emitting technologies. Storage can serve as a cost-effective and low impact solution for integrating growing levels of renewable energy, both by complementing or substituting for more expensive traditional transmission facilities and by avoiding curtailment of renewable energy and other clean energy resources. At the distribution level, energy storage systems can facilitate adoption of clean energy resources such as customer-sited photovoltaic ("PV") systems by *enhancing* hosting capacity along the distribution grid.

Since energy storage is critical to supporting a clean energy plan, energy storage policy considerations must be included. ESA commends Commissioner Kennedy and Commissioner Tobin for recognizing that there is a difference between policies aimed at changing the generation portfolio of the grid and policies focused on enhancing grid flexibility and resilience in their proposals. ESA respectfully recommends that the Commission consider separate but

complimentary policies to enable energy storage to operate across the grid in a way that optimizes both existing and new generation. ESA proposes a three part framework for driving energy storage deployment: (1) a storage deployment target that will ensure the infrastructure is in place to support the Commission's clean energy objectives; (2) programs to ensure the realization of the target, including market-based solutions and incentives; and (3) reforms to utility and grid planning rules to ensure energy storage is adequately considered next to traditional investments. This framework will ensure there are mechanisms to value and compensate flexible capacity and enhanced resilience, and will enable the least-cost, best-fit solution that provides ratepayers with the greatest value.

Energy Storage Target

Recognizing that energy storage is part of the electric grid infrastructure and not solely a resource in a portfolio mix, ESA supports recommendations for the development of a long-term storage deployment target. A deployment target should be based on the optimal level of deployment of energy storage, where the benefits exceed the costs. A deployment target would set the overarching objective for deployment of energy storage, while market-based programs, incentives, and utility planning rules are the mechanisms by which the State will achieve those levels of deployment. For example, a clean capacity program and a customer-sited incentive program, as we discuss later, would help facilitate reaching the target. Similarly, any procurement requirements that the utilities would be obligated to meet as a part of the target would be incorporated into existing planning processes (i.e., distribution planning and integrated resource planning) to ensure energy storage assets are acquired in a way that provides the most cost-effective solution for a demonstrated grid need and is aligned with utility planning horizons.

Commissioner Tobin rightly put forward a storage target in his Energy Modernization Plan. ESA is especially encouraged that Commissioner Tobin's proposal correctly identifies the need for a target that includes electrochemical, mechanical, thermal, and gravitational energy storage technologies and encourages a variety of system sizes, ownership models, and applications.[1] The deployment target outlined in Commissioner Tobin's Energy Modernization Plan is in line with other states seeking to incorporate significant amounts of intermittent resources and replace retiring capacity. For example, California's 1,325 MW energy storage target by 2020 is intended to align with a 40% RPS target for that year. Similarly, New Jersey's target of 2,000 MW by 2030 aligns with a 50% renewable energy by 2030 goal and a 100% clean energy by 2050 goal. However, the target in the draft rules submitted to the Commission on July 5, 2018, did not include sufficient details on how the target would be allocated based on application or point of interconnection, nor did it clarify how the utility procurements would be incorporated into the existing planning processes.

In her plan, Commissioner Kennedy underscores the importance of distributed energy storage, and calls for mechanisms to ensure its deployment. It may be appropriate for the Commission to require a sub-category of the overall deployment target be met through distribution connected resources. Again, this would need to be complemented by programs to drive the market for distribution-connected storage, including incentive programs.

[1] ESA respectfully recommends that the Commissions ensure that the definition of storage throughout the energy rules is streamlined, and suggests the following definition to ensure all energy storage technologies are able to participate in the State's programs:

Energy Storage System: Commercially available technology that is capable of retaining energy, storing the energy for a period of time, and delivering the energy at a later time, including, without limitation, by chemical, thermal or mechanical means.

Clean and Flexible Capacity Requirement

While a renewable or clean energy standard serves to increase the proportion of clean energy on the grid overall, ESA contends it is appropriate to complement it with a separate market-based mechanism to ensure that a proportion of clean energy resources are delivered during periods of peak demand, when fuel-based generators tend to supply a larger share of electricity. There are several ways to facilitate this policy outcome. A Clean Peak Standard, such as the one proposed by Commissioner Tobin in the Energy Modernization Plan, creates one such mechanism to value the specific time of day that clean energy resources deliver electricity—whether directly or via storage for re-delivery at peak. Alternatively, the Commission might explore a "Clean Flexible Capacity Requirement" that requires a certain percentage of new proposed capacity to provide defined flexibility benefits while reducing carbon emissions. The Commission could similarly consider a "Clean Shift Rate," which uses a tariff to compensate customer-sited energy storage resources for shifting the delivery of clean energy to the grid from low-value periods to high-value periods.

The details of any clean and flexible capacity program are critical to ensuring the policy achieves its goal of reducing greenhouse gas emissions and ratepayer costs across the system. ESA underscores the importance of enabling standalone energy storage systems to qualify for any clean and flexible capacity program, rather than solely relying on energy storage co-located with renewable generators. Allowing standalone storage that can prove eligibility would ensure that storage is installed in areas that provide optimal benefits to ratepayers (e.g., areas of congestion), rather than only where renewable energy resources are located, which may be suboptimal locations. The program details should be animated by the goals of the program. The concept of a clean and flexible capacity program should be predicated on the public policy goals

of reducing emissions and costs to ratepayers in meeting peak demand periods. With that in mind, any technology capable of meeting both standards (i.e., reducing emissions in a cost-effective way during peak periods) should be able to participate – including standalone energy storage.

ESA recommends a simple and straightforward approach to determining eligibility of standalone storage for any clean and flexible capacity programs. Each eligible resource should be able to meet one of the following three criteria in order to obtain compensation under a clean and flexible capacity program.

(1) *The resource is co-located with a renewable energy generator.* Any technology that is able to demonstrate that it charged from a renewable generation and that those RECs are being retired without compensation.

(2) *Retire an eligible REC without payment to demonstrate eligibility.* ESA proposes that any resource that can retire an RPS eligible REC without compensation is just as effective from a greenhouse-gas emissions perspective as a co-located resource (plus additional RECs to account for roundtrip efficiency losses for energy storage).

(3) *Demonstrate that the resource was charged at low emissions hour.* Over the long-term, greater information about the hourly emissions profile of the grid through programs and price signals is needed to facilitate charging during low emissions hours.

Distributed Storage Opportunities

In addition to a market-based mechanism like the clean and flexible capacity program or requirement, incentive programs to support energy storage may also be appropriate. Commissioner Kennedy rightly recognized the importance of distributed storage assets and their potential benefits and suggested an incentive program for customer-sized resources. ESA strongly urges the Commission to implement this proposal to support the overall storage deployment target. Customer-sited energy storage offers a new way to utilize demand resources

since it is highly controllable, can be dispatched in a fast and precise manner, and can be measured directly by utilities for system operations. Aggregations of customer-sited storage are already being used by utilities in some instances to meet capacity and grid reliability needs.

An incentive program is an effective tool to drive down soft costs for the installation of energy storage systems. Incentives should be applied in parallel with a broader review of existing price signals and programs needed to ensure energy storage systems behave in alignment with the grid's needs. The incentive should be phased out over time with soft cost reductions and increasing availability of programs and price signals that provide alternative compensation opportunities. ESA has recently written a guide on the development of an effective energy storage incentive program[2] and looks forward to engaging the Commission and other stakeholders on this topic.

Other programs may be necessary to support the broad deployment of customer-sited storage and to integrating energy storage assets into the grid. Creating programs that allow customer-sited storage systems to respond to requests by utilities for grid services will create additional value streams for energy storage assets and provide optimal benefits for ratepayers by potentially deferring or reducing the need for additional investment on the distribution system. For example, programs in Vermont and New Hampshire have embarked on pilots that allow customers to provide grid services in exchange for on-bill credit. Another useful model is the National Grid and Eversource "Daily Dispatch" program in Massachusetts. Under this program, the utility commits to a five-year contract with a customer, which allows the customer to make

[2] Energy Storage Association, *Energy Storage Incentive Program Issue Brief*, February 2019, available at: http://energystorage.org/resources/energy-storage-incentive-programs

the capital investment in energy storage in exchange for a commitment to use the storage to provide grid services for five years.

Utility Planning and Prudency Rules

The utility planning process is the critical area for the Commission to ensure that energy storage can provide ratepayers substantial savings by reducing the need for excess capacity and provide lower cost non-wires solutions to traditional investment. Rapid cost reductions in advanced storage technologies, as well as the Commission's recent policy signals, have helped drive significant investment in storage by Arizona's utilities, most notably Arizona Public Service's recent announcement of plans to deploy 850 MW of utility owned and third party contracted energy storage. While such proposals are extremely encouraging, they do not negate the need for the Commission to review utility planning rules to ensure that energy storage and other technologies have a level playing field with other traditional investments. The utility planning rules are the mechanisms by which to ensure that utilities are modeling and considering energy storage in a way that aligns with the Commission's broader energy goals.

ESA has previously submitted comprehensive comments with the Commission on the key elements for integrated resource planning ("IRP") rules that the Commission should undertake to ensure inclusion of storage in IRP processes enhances prudent planning for Arizona ratepayers.[3] These guidelines include:

1) Use up-to-date storage cost estimates and cost forecasts to better identify near- and long-term prudency of storage;

[3] Energy Storage Association comments in Docket No. E-00000Q-160289, April 23, 2018, available at: http://energystorage.org/system/files/resources/2018-4-23_az_acc_e-00000q-160289_modernization_plan_comments.pdf

2) Employ sub-hourly intervals in modeling to quantify the value of both capacity and flexibility benefits provided by energy storage;
3) Institute a "net cost" analysis of capacity investment options or alternative method to more accurately compare energy storage with traditional capacity resources;
4) Incorporate system flexibility needs into reliability metrics to better account for the characteristics of the future supply mix; and
5) Analyze demand resources as distinct resource options separate from load forecasts to seek the widest range of cost-effective resources.

At its July 2018 meeting, the National Association of Regulatory Utility Commissioners ("NARUC") adopted resolution EL-4/ERE-1, "Resolution on Modeling Energy Storage and Other Flexible Resources" incorporating several of these recommendations. These guidelines provide similar recommendations to incorporate new modeling tools that allow for a more complete evaluation of energy storage and analyze a range of flexible resource options. A number of these recommendations have been incorporated into planning guidelines in other states, including Colorado, Washington, New Mexico, and Michigan. In October 2017, the Washington Utilities and Transportation Commission ("UTC") revised its resource planning rules to ensure that utility planning and procurement activities adapt to changing utility needs and availability of new technologies by calling on utilities to incorporate sub-hourly modeling, up-to-date cost data, and a net cost analysis. In addition to the State of Washington, regulators in New Mexico and Michigan have similarly issued rules requiring utilities to consider energy storage in their resource planning exercises.[4] Sub-hourly modeling, net cost approaches, flexibility metrics, and distinct demand resource modeling have been employed in other utilities'

[4] See New Mexico Public Regulation Commission, Final Order Amending Integrated Resource Planning Rules 17.7.3 NMAC to Include Energy Storage, Case No. 17-00022-UT, 9 August 2017, available at: http://www.nmprc.state.nm.us/general-counsel/docs/17-00022 UT%20Final%20Order%20Amending%20Intergrated%20Resource%20Planning%20Rule17%207%203%20NMAC%20to%20Include%20Energy%20Storage%20Resources.pdf. See also Michigan Public Service Commission, Opinion and Order of the 21 December 2017 meeting of the Michigan Public Service Commission in Lansing, Michigan, available at: https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000001X2Co.

IRPs recently.[5] Finally, in 2018 ESA published a primer on including energy storage in integrated resource planning, which discusses some of these topics in greater detail and may be a helpful reference for the Commission.[6]

ESA also respectfully recommends that the Commission review existing transmission planning rules to better include energy storage as a potential transmission solution. Energy storage systems are technically capable of providing cost-competitive reliability services akin to a conventional transmission asset. An excellent example of transmission deferral in the State of Arizona was undertaken by Arizona Public Service ("APS") through the deployment of a 2 MW / 8 MWh (4-hour duration) energy storage system to defer investment on a 20-mile transmission line in Punkin Center. Given the potential for an increase in the State's renewable energy requirements, energy storage can reduce the need for large transmission investments. Such reforms of the transmission planning process should include, among other things specifying energy storage as a potential transmission solution and clarifying how storage solutions will be studied and evaluated. Finally, given the pending expiration of the Commission's moratorium on new construction of natural gas plants, ESA recommends that the Commission review existing requirements around Certificates of Convenience and Necessity (CC&N) to ensure that when future traditional assets are proposed, there is a robust alternatives analysis demonstrating that

[5] See Chapter 8 in *Portland General Electric 2016 Integrated Resource Plan*, issued 15 Nov 2016, available at: https://www.portlandgeneral.com/our-company/energy-strategy/resource-planning/integrated-resource-planning. See also *Hawaii Electric Companies' Power Supply Improvement Plan*, issued 23 Dec 2016, available at: https://cca.hawaii.gov/dca/files/2016/12/dkt_2014_0183_20161223_companies_PSIP_update_report_1_of_4.pdf. See also *PNM 2017-2036 Integrated Resource Plan*, issued 3 July 2017, available at: https://www.pnm.com/irp. See also *APS 2017 Integrated Resource Plan*, issued April 2017, available at: https://www.aps.com/library/resource%20alt/2017IntegratedResourcePlan.pdf.

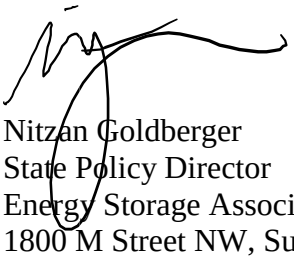
[6] Energy Storage Association, *Advanced Energy Storage in Integrated Resource Planning*, June 2018, available at: http://energystorage.org/system/files/attachments/esa_irp_primer_2018_final.pdf

energy storage resources were explored, and if applicable, a sufficient explanation for why they were not as cost-effective or suited to meet the needs the project seeks to address.

III. CONCLUSION

ESA appreciates the opportunity to provide these comments and recommendations on the implementation of reforms to the energy rules. ESA looks forward to working with the Commission and other stakeholders to develop the specific programmatic elements to support the vision of the Commission. Given the extensive engagement with stakeholder on these key issues to date, as well as the expiration of the moratorium on new natural gas construction in place, it is critical that the Commission advance important reforms to the energy rules soon.

Respectfully submitted this 25th day of March, 2019.



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