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Comment Received From: BSH Home Appliances Corporation

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Comments re: Need for Flexibility in the Electricity System

Additional submitted attachment is included below.

BEFORE THE CALIFORNIA ENERGY COMMISSION

In the matter of) Docket No. 17-IEPR-07
2017 Integrated Energy Policy Report) Joint Agency Workshop
(2017 IEPR)) Re: Need for Flexibility in the Electricity
) System
)

**Comments of National Grid USA on the
Increasing Need for Flexibility in the Electricity System**

National Grid USA (“National Grid”) commends the California Energy Commission (“CEC”), California Public Utilities Commission (“CPUC”), and California Independent System Operator (“CAISO”) (collectively the “Joint Agencies”) on conducting the workshop held on May 12, 2017, regarding the need for flexibility in the electricity system National Grid USA (“National Grid”). National Grid appreciates the opportunity to provide comments in response to the “Notice of Joint Agency Workshop on the Increasing Need for Flexibility in the Electricity System” dated May 1, 2017.

A. Interests of National Grid

National Grid is a subsidiary of National Grid plc, a Fortune Global 500 company and one of the largest investor-owned energy companies in the world, with a market capitalization of over \$50 billion. National Grid plc has utility operations in both the United Kingdom and the United States. National Grid is actively engaged in the development and operation of bulk transmission and grid-scale storage assets that will be necessary as the United States transitions the electric system to a low-carbon grid.

National Grid believes that pumped storage hydropower will be critical to ensuring flexibility of the electricity system. Pumped storage hydropower is a mature and commercially proven technology. Because it can be deployed at utility-scale cost-effectively, pumped storage is uniquely positioned to leverage existing regional infrastructure and resources to address current and foreseeable regional challenges, including grid reliability and the integration of additional renewable energy resources. National Grid is presently pursuing development of the two most promising pumped storage projects in the Pacific Northwest, the Swan Lake North Pumped Storage Hydropower Project in southern Oregon (“Swan Lake Project”), and the JD Pool Pumped Storage Hydropower Project in southern Washington (“JD Pool Project”). The Swan Lake Project is being jointly developed by National Grid and Rye Development. Both projects will utilize environmentally-friendly “closed-loop” technology, are located near existing high voltage transmission corridors (i.e. AC-DC Interties), and will be capable of providing unmatched flexibility, capable of serving multiple uses and providing stacked benefits on an individual utility and/or regional basis.¹

¹ The Swan Lake Project filed a license application at the Federal Energy Regulatory Commission on October 28, 2015 (FERC Project No. 13318).

While the pumped storage projects that National Grid is developing are physically located in the Pacific Northwest, they can play an important role with respect to providing the flexibility that California needs to effectively integrate renewable resources and cost-effectively decarbonize the grid. The Pacific Northwest already provides a substantial amount of electricity to California and additional flexibility could enable California to better utilize intermittent resources from the region. As the 2017 IEPR Scoping Order correctly explains: “[A]n expanded Western Energy Imbalance Market for dispatch adjustments and a more regional market for day ahead commitment and transmission planning, including expanding access to the Federal Columbia River Power System, could greatly enhance the flexibility needed to integrate increasing amounts of variable renewable resources.”²

The unique location of the Swan Lake Project will enhance its value as a regional resource. Located in southern Oregon and interconnecting to the nearby Malin Substation, the Project will use the California-Oregon Intertie to deliver power to, or receive power from, California. Alternatively, the Project could interconnect at the nearby Captain Jack Substation and send or receive power using the California-Oregon Transmission Project. In either case, the Project will be well situated to serve as a regional pumped storage resource that can meet the needs of California and Oregon investor-owned utilities and publicly owned utilities and the needs of the CAISO.

The 1200-MW JD Pool Project is also strategically located at the top of the AC-DC Interties along a major import/export path to SP15. JD Pool would support and enhance beneficial regional power exchanges between California and the Pacific Northwest. In addition JD Pool is a highly viable project with secure water rights and little controversy.

B. The Joint Agencies Need to Take Prompt Action to Secure Adequate Flexible Resources

Presentations and comments at the May 19, 2017 workshop made clear that the Joint Agencies need to take prompt action to secure adequate flexible resources. As detailed by the CAISO, the need for flexible resources is even more acute than indicated by the CAISO’s original “duck chart”, which it developed demonstrate the need for flexible resources to integrate solar and wind resources. As the CAISO explained, the very low levels of “net load” (load minus solar and wind) and the steep ramps that it forecasted in the past have arrived much sooner than anticipated. Unfortunately, however, solutions to the flexibility needs are not yet in place.

The CAISO’s ongoing bulk storage studies have shown that bulk storage can be an effective way to provide the flexibility which is needed.³ Fortunately, it appears that the CPUC is poised to consider bulk storage in the current Integrated Resource Planning proceeding. The CPUC issued a draft Energy Division “Proposal for Implementing Integrated Resource Planning at the CPUC”

² 2017 Integrated Energy Policy Report Scoping Order, CEC Docket No. 17-IEPR-01, dated March 6, 2017, at 3.

³ Mark Rothleder of the CAISO included the latest results of the CAISO’s ongoing bulk storage study on page 23 of his presentation at the workshop entitled “Renewable Integration” which is available at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=17-IEPR-07>

on May 15, 2017 (“Energy Division Proposal”), which indicates that the CPUC will consider and assess the need for bulk storage. Depending on the results of that analysis the CPUC may expedite consideration of long-lead time projects such as pumped storage projects.⁴ Failure to expedite consideration of long lead-time assets like pumped storage, including specific procurement mechanisms or other solutions to enable development, will likely mean that such resources cannot be brought online in time to meet the anticipated need. This would be a costly error and a lack of planning foresight to make available this proven, cost-effective option.

While the CPUC will consider the need for pumped hydro in the context of the investor owned utility Integrated Resource Plans, California should not rely on or defer to the CPUC to resolve this critical issue. The CEC, the CAISO, publicly owned utilities, and the Governor should consider, through the IEPR and elsewhere, what sorts of regulatory changes or legislation may be necessary to ensure adequate bulk storage is available to maintain reliability while ensuring cost-effective decarbonization of California’s electric grid.

C. Removing Impediments to the Development of Pumped Storage

National Grid supports the efforts of the Joint Agencies and other stakeholders at the workshop to identify impediments to the development of pumped storage. National Grid generally agrees with the comments of Eagle Crest Energy on this issue.⁵ In addition, National Grid comments as follows:

1. Need for Procurement Mechanism

The most significant barrier to development of pumped storage is lack of a feasible procurement framework. In order to secure financing, projects must demonstrate expected future revenues through long-term contracts or commitments. Utilities, in turn, are resistant to entering into such agreements without assurance of rate recovery and equitable allocation of costs.

As Chairman Weisenmiller observed at the workshop, it is not realistic to assume that a merchant pumped storage project can be financed due to market uncertainties. National Grid agrees. It may be similarly unrealistic to utilities to contract bilaterally for large energy storage resources that provide regional benefits beyond any individual utility’s service territory. A new procurement mechanism is needed.

In order to enable pumped storage projects to secure financing, which is prerequisite to development, California energy policy makers should: (1) provide clear policy directives that utilities must consider the need for bulk storage with realistic planning and development timelines; (2) develop a mechanism for contracting with multiple off-takers, with off-ramps if needed, for provision of bulk energy storage services, or for partnering with utilities in

⁴ See, e.g., Energy Division Proposal at 12 (“A new track or proceeding may be opened to further explore any capital intensive, long-lead time resources (e.g., out-of-state wind, large-scale pumped hydro, etc.) that IRP analysis indicates is likely to be beneficial.”)

⁵ The pumped storage developer who spoke was Doug Divine of Eagle Crest Energy, the developer of the Eagle Mountain Pumped Storage Project in Southern California.

ownership, development and operation of projects, and (3) a process for timely review and approval of contracts and projects by regulators .

In California, the CPUC has overcome some of the impediments to development of storage by setting a storage mandate, but it excluded pumped storage over 50 MW.⁶ The CPUC reasoned that including larger pumped storage as eligible would hinder market transformation for smaller distributed storage technologies. While market transformation is a laudable goal, the CPUC's primary statutory mission is to ensure that California's investor owned utilities provide reliable service at just and reasonable rates. Development of pumped storage, which is a necessary solution to clean cost-effective integration of renewable energy at the scale needed, will help California achieve its policy goals while minimizing cost to ratepayers. The CPUC, and the CEC as it undertakes its own IRP process, should use the opportunity afforded by the IRP to develop a clear path for development for pumped storage hydro.

2. Issue Guidance Regarding How the Benefits of Storage Should be Evaluated

An important first step in harnessing the potential of energy storage is to recognize and account for the multiple benefits and value of energy storage in its intended application. Energy storage can perform the functions of energy, capacity, and transmission. Indeed, energy storage is a remarkably flexible resource that can provide multiple services, including frequency response, contingency reserves, peaking capacity, regulation, load following, energy, renewable integration, arbitrage, voltage/reactive power support, outage mitigation, transmission congestion relief, and distribution and transmission upgrade deferral.

Accordingly, National Grid encourages efforts to facilitate a process that overcomes historical barriers by developing a framework that fairly reflects the "all-in" value of storage by accounting for services across the traditional silos of energy, transmission, and distribution. A fair evaluation of the benefits generated by the multiple services that storage provides will lead to better decision-making, and optimal deployment of bulk storage. When planning leads to better identification of least-cost resources, consumers benefit.

In order to assess the benefits of pumped storage, modeling of the regional electricity market will be necessary. The CAISO has already provided some modeling results and its continuing modeling efforts are important. But, further sub-hourly modeling of the regional electricity market for each proposed project should be done.

It is our understanding that as part of its IRP process the CPUC has already formed a modeling advisory group. The CPUC should enlist the assistance of this group for purposes of developing guidelines for modeling of pumped storage, including broader regional coordination with the Northwest Power Planning Council which is also engaged in modeling the impact of pumped storage on the grid.

We also believe that there are certain energy storage resource benefits that may not be easily quantifiable, including market transformation, resiliency, and reliability benefits, but utilities

⁶ CPUC D.13-10-040 at 34-27(discussing exclusion of pumped storage over 50 MW from storage mandate).

should be encouraged to look at energy storage in a cohesive and comprehensive manner during procurement and be allowed to consider and give weight to these considerations, provided that the resource is otherwise reasonably competitive.

In connection with our development of pumped storage resources in the Pacific Northwest, National Grid has made investments in significant (and ongoing) modeling efforts by E3 that show substantial value in the hundreds of millions of dollars per year of a single pumped storage project by providing generation capacity value, energy arbitrage (negatively priced solar and must run wind), regulation up/down, spinning reserve and non-spinning reserve, in addition to avoided curtailment, fuel/O&M savings, and start cost savings. If this is of interest, we would be willing to share these results in a workshop.

3. Regulatory Changes Needed to Facilitate Development of Pumped Storage

In order to facilitate development of pumped storage, the Joint Agencies should be proactive with respect to making the regulatory changes needed to accommodate development of pumped storage.

The CAISO has already made a number of significant changes to accommodate development of the storage projects that have entered into agreements with utilities as a result of the storage procurement mandate issued by the CPUC, but it can do more. For example, late last year the Federal Energy Regulatory Commission (“FERC”) issued a notice of proposed rulemaking which would require all independent system operators to review their tariff rules to remove barriers to the participation of electric storage resources.⁷ The CAISO can begin a stakeholder proceeding to consider making the types of changes that will be necessary to ensure that storage operators are able to participate and to receive just and reasonable compensation for the services they provide. As part of this stakeholder proceeding, the CAISO could also consider changes that reflect FERC’s policy statement regarding the circumstances under which the costs of storage can be recovered in transmission rate base.⁸

The CEC can also make regulatory changes needed to facilitate development of pumped storage. For example, in the recently adopted guidebook on RPS eligibility, the CEC provided the helpful clarification that when RPS-eligible renewable energy is used for charging a pumped storage facility the RPS-eligible renewable energy can be counted toward the RPS.⁹ The Guidebook does not make clear, however, whether charging energy will count toward Category 1, 2, or 3 requirements. The Guidebook also does not address whether EIM resources can count toward RPS requirements.¹⁰

⁷ FERC, Notice of Proposed Rulemaking, “Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators,” 157 FERC ¶ 61,121 (Nov. 17, 2016).

⁸ FERC, Policy Statement, “Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery,” 158 FERC ¶ 61,051 (Jan. 19, 2017).

⁹ CEC. Guidebook - Renewables Portfolio Standard Eligibility, Ninth Edition (Revised), at 41.

¹⁰ *Id.* at 3.

4. Facilitate Use of an Interregional Approach

Because grid-scale storage resources can provide substantial interregional benefits, it is necessary to consider these benefits in order to properly determine the value of the combined services that grid-scale storage can provide. As a large utility scale resource interconnecting at transmission voltage, pumped storage is capable of providing portfolio-wide benefits that can optimize a utility's existing system or even the regional bulk power system. In just one example of a portfolio-wide benefit of pumped storage, the huge synchronous generators used by pumped storage can provide spinning inertia necessary to support overall grid stability and reliability, which has traditionally been provided by gas-fired generators.

A current challenge to making this assessment is that utility IRPs focus on the specific needs of each utility. In order to facilitate development of regional resources, it is important for regulators to encourage joint planning work among utilities on a project specific basis. With respect to a proposed project such as the Swan Lake Project which is in the border region between Oregon and California and JD Pool at the top of the AC-DC Interties, it is particularly important for state commissions to encourage regional planning that transcends jurisdiction boundaries. Fortunately, the CPUC has already taken steps to facilitate such regional cooperation by entering into a Memorandum of Understanding with the Oregon Public Utility Commission and the Washington Utilities and Transportation Commission to cooperate on matters relating to climate change.¹¹

D. Conclusion

We appreciate the opportunity to provide these comments. Development of a policy on energy storage is an important early step towards realizing the potential of energy storage. Pumped storage can provide unmatched flexibility as a resource, serving multiple roles and providing stacked benefits on a portfolio-wide basis. The flexibility and value of this resource is underappreciated and likely to increase in value in the foreseeable future, given resource constraints and competing policy challenges. When the combined benefits of pumped storage are fairly evaluated, we believe this can be a least-cost resource. If you have any further questions regarding these comments, please contact Nate Sandvig at (503) 602-0998 or Erik Steimle at (617) 701-3288.

Dated this 25th day of May, 2017.

Respectfully submitted,

¹¹ "Western Public Utility Commissions' Joint Action Framework on Climate Change," dated March 3, 2017.

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