

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Pursuant to)	
Assembly Bill 2514 to Consider the Adoption of)	Rulemaking 10-12-007
Procurement Targets for Viable and)	(Filed December 16, 2010)
Cost-Effective Energy Storage Systems)	
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**COMMENTS OF
BROOKFIELD RENEWABLE ENERGY PARTNERS LP
ON JUNE 10, 2013 ASSIGNED COMMISSIONER RULING**

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I. INTRODUCTION

Pursuant to the Assigned Commissioner’s June 10, 2013 Ruling Proposing Storage Procurement Targets and Mechanisms (“Ruling”) in the above captioned proceeding (“Energy Storage OIR”), Brookfield Renewable Energy Partners LP (“Brookfield”) respectfully submits the following comments. As outlined more fully below, Brookfield continues to support the creation of a technology neutral environment in this proceeding, where all resources can compete on a level playing field. However, while the Ruling provides support for emerging storage technologies, it inappropriately disadvantages pumped storage,¹ a mature energy storage technology that can play a major role in achieving the goals of AB 2514.² Brookfield requests that the Commission ensure that its final decision in this proceeding does not tilt the playing field against pumped storage or any other storage technology that meets the requirements of AB 2514. To that end, Brookfield requests that the Commission approve in its final decision a separate bilateral contracting process that accommodates long-lead time, large capacity pumped storage

¹See Ruling at 17 (“All third-party owned energy storage resources as defined by law, except for pumped hydrological resources, would be eligible to bid into the energy storage reverse auctions.”)

²See Pub. Util. Code § 2835(a)(3).

projects so they may be fairly evaluated for cost effectiveness, compete to provide the proposed procurement targets, and not be placed at an unwarranted competitive disadvantage.

Brookfield's power generation operations located in North America and Brazil total more than 5,000 MW of predominantly renewable energy resources. Within California, Brookfield owns and operates 430 MW of wind capacity as well as the 30 MW Malacha hydro electric facility. Brookfield also has the 280 MW Mulqueeny Ranch Pumped Storage Project located in Livermore, California under development. This project is unique in that Brookfield proposes to use recycled waste water from the city of Tracy as the water resource for an off-stream pumped hydro energy storage system.

II. PUMPED STORAGE IS IDEALLY SITUATED TO MEET OPERATIONAL NEEDS AND FACILITATE RENEWABLE INTEGRATION.

The CAISO has reported the need for increasing quantities of flexible capacity to manage steep ramps beginning in 2015 that could be as high as 13,500 MW over the course of several hours by 2020. The Commission's recent decision in the annual Resource Adequacy proceeding³ determined that flexible capacity requirements will be incorporated into the Resource Adequacy program starting in 2015.⁴ Discussions will also officially begin in July 2013 on a 3-5 year forward procurement mechanism for capacity. Pumped storage with its large scale, fast ramping capabilities and its ability to discharge stored energy over longer timeframes is ideally situated to provide flexible capacity and a variety of other products and services to the electric grid to support renewable integration. Given its large-scale and proven grid benefits, pumped storage

³R.11.10.023 issued October 20, 2011.

⁴R.11.10.023, Decision Adopting Local Procurement Obligations for 2014, a Flexible Capacity Framework, and Further Refining the Resource Adequacy Program, at pp. 66 & 70, issued June 27, 2013.

provides one of the few non-fossil alternatives capable of meeting the new flexible capacity requirements.⁵

III. THE RULING'S TREATMENT OF PUMPED STORAGE IS CONTRARY TO THE INTENT OF AB 2514.

The Ruling discourages and disadvantages pumped storage systems by excluding pumped storage from the energy storage reverse auctions, while failing to adopt a separate bilateral procurement process to accommodate its unique development requirements. The Ruling provides no explanation for this treatment. It seems to simply assume that mature technologies, such as pumped storage, encounter no barriers to deployment that require action from the Commission. Not only is such an assumption inaccurate but the Ruling's resultant treatment of pumped storage cannot be reconciled with AB 2514.

AB 2514 expressly includes storage systems that use mechanical processes to store energy generated at one time for use at a later time, or to store energy generated from mechanical processes that would otherwise be wasted for delivery at a later time.⁶ Pumped hydro storage uses mechanical processes, and falls squarely within that description.

As section 1 of AB 2514 makes clear, the purposes of the statute are to facilitate renewables integration, optimize the use of wind and solar, reduce costs to ratepayers, reduce the use of fossil fuels to meet peak load requirements, meet ancillary services needs that would otherwise be met by fossil-fuel generating facilities, and eliminate barriers to obtaining the benefits of energy storage systems. The statute is not intended to give preference to certain energy storage technologies over others that meet the cost-effectiveness test.

⁵Supply resources must be able to ramp and sustain output within a continuous three-hour period to meet flexible capacity requirements. *Id.* at 51.

⁶*See* Pub. Util. Code § 2835(a)(4)(A) & (D).

In fact, section 2385(f) specifically provides that “Nothing in this chapter, and no action by the commission, shall discourage or disadvantage development of an energy storage system by an electrical corporation.” Excluding pumped storage from the procurement framework and failing to accommodate its unique development requirements would discourage and disadvantage development of pumped storage projects. Thus, the Ruling’s treatment of pumped storage runs afoul of section 2385(f).

There is simply no language in AB 2514 that provides a basis for categorically excluding pumped storage or any other form of energy storage technology. On the contrary, the statute repeatedly references the benefits that would come from “expanded use of energy storage systems,” never once qualifying the reference to refer solely to emerging storage technologies.

IV. PUMPED STORAGE IS A MATURE TECHNOLOGY BUT FACES ITS OWN UNIQUE BARRIERS THAT REQUIRE ACTION FROM THE COMMISSION AS PART OF THIS PROCEEDING.

Brookfield has been active in the Storage OIR from its inception with the goal of ensuring that both the benefits pumped storage can provide to the electric grid, as well as the unique barriers to deployment faced by such a mature, larger capacity storage technology, are acknowledged and addressed. While pumped storage can provide a variety of products and services to the electric grid, all of the existing pumped storage systems that are active in California were utility-built under traditional cost of service recovery mechanisms with regulatory oversight applicable at the time of their development. This cost-of-service based model resulted in successful development of pumped storage as it is well-suited to long lead-time, large-scale and complex energy infrastructure development. Today, independent power producers face significant barriers under the existing regulatory paradigm when attempting to

develop capital intensive, long-lead time projects, such as pumped storage, for a number of reasons. In particular, those barriers are:

(1) Existing market structures do not adequately compensate pumped storage resources for the unique basket of services and benefits that they provide to grid operators. This is particularly evident in terms of providing incentive to build new resources with their commensurate development timelines and risk profiles. While this situation is not unique to California, it highlights the importance of appropriately designed procurement processes that are geared to long-term large-scale pumped storage development.

(2) The long development and commercial timelines needed to realize these projects extend beyond the timelines accommodated through existing procurement processes. In addition to needing procurement structures that recognize these timeframes, ratepayers may benefit from the ability to refine the timing and definition of a project over time, giving merit to alternative contract structures which can provide flexibility (and therefore reduce overall costs).

(3) Costs for these projects, and thus pricing, cannot be fully and accurately estimated until a significant amount of upfront work is completed. As is the case with other large-scale grid infrastructure projects, commercial realities dictate that this work cannot be performed unless there is reasonable assurance of cost recovery and/or procurement approaches that recognize staged development processes. This barrier requires that more flexible terms and conditions regarding timing and pricing be provided than are currently available through existing procurement processes.

(4) Because of the need for utilities to obtain procurement approvals well in advance of project completion, the benefits pumped storage projects can provide may not be fully recognized in the evaluation of a project's cost-effectiveness. Large-scale pumped storage projects, with their fast ramping capabilities and ability to discharge substantial amounts of stored energy over long timeframes, can offer a range of services that provide value to the system and make the system more robust under evolving conditions.

For these reasons, the typical contracting process and the standard power purchase agreement used for projects with shorter development timeframes and more standardized designs is not a practical alternative for pumped storage.

V. PUMPED STORAGE SYSTEMS CANNOT EFFECTIVELY COMPETE IN ANY EXISTING PROCUREMENT PROCESS AND, ABSENT REGULATORY ACCOMMODATION, THESE VALUABLE GENERATING ASSETS WILL BE LEFT OUT OF THE RESOURCE MIX TO THE DETRIMENT OF RATEPAYERS.

In view of the unique barriers to deployment described above, Brookfield believes there is no existing procurement process that would allow pumped storage to compete on a level playing field with other technologies and be fairly evaluated for cost effectiveness. At the same time, pumped storage cannot fit into a new procurement process designed for emerging storage technologies due to pumped storage's unique development requirements. To meet the objectives and requirements of AB 2514, consistent with the best interests of ratepayers, it is necessary that a procurement process be adopted in which pumped storage can compete. A separate procurement process for long lead time projects or an expansion of the existing LTPP process is needed to allow for more flexible terms and conditions related to timing and pricing.

In our prior comments, Brookfield recommended the Commission consider facilitating a separate bilateral contracting process for long-lead time projects that would provide more

flexible terms and conditions around both timing and pricing. Brookfield suggested that this process could commence after it is determined that a pumped storage project is qualified to meet a pre-defined set of system requirements (*e.g.*, response time, load balancing requirements, energy discharge timeframes, energy/capacity) as determined by grid requirements and the potential buyer. If a project is determined to be cost effective, development could proceed initially with a detailed feasibility study that would allow the project to progress through a series of defined milestones until such time when more certainty in pricing and need can be determined. Such a process could incorporate off-ramps that allow for appropriate risk-sharing between the buyer and seller as the project becomes more defined through the normal development process. Precedents for such processes can be seen with large-scale transmission development that is similarly long lead-time with relatively high initial uncertainty. Further, such transmission projects utilize cost of service recovery mechanisms, which may also prove beneficial for pumped storage projects for both buyer and seller, and reflect alternative risk sharing arrangements.

Brookfield is not asking for a mandate but rather for a procurement channel that would allow pumped storage to be evaluated and compete against other technologies if it is determined to meet defined electric grid requirements. The existing regulatory paradigm excludes pumped storage from participating in any procurement process due to its unique development requirements. By excluding pumped storage in its recent ruling and not identifying a clear channel through which it can compete, the Commission is inadvertently leaving in-place substantial barriers to its development in California, which is not optimal for ratepayers given the substantial long-term benefits pumped storage can provide to the grid.

At this time, Brookfield is seeking a response and guidance from the Commission on the concerns and suggestions we have outlined in our current and previous comments. If the Commission does not agree with the barriers to deployment we have defined and believes there is an existing procurement process that would allow pumped storage to be fairly evaluated and competitive, Brookfield requests more information on that process and how it would work for long lead time projects.

VI. CONCLUSION

While specific operational requirements for the electric grid over the next few years continue to be defined, it is clear that there will be a need for pumped storage and other large capacity storage technologies to ensure the future reliability of the electric grid and provide operational flexibility over a broad range of applications.

Brookfield requests the Commission specifically address the challenges faced by mature larger capacity storage technologies as part of this proceeding and allow pumped storage to compete towards fulfilling the proposed procurement targets. Absent regulatory change, these projects will simply not get developed and the utilities, and consequently California ratepayers, will miss out on a commercially viable, cost effective, long-life generating asset that can provide solutions to many of the challenges the grid operator will face in light of the increasing volumes of intermittent resources coming online in the next few years.

Brookfield appreciates the opportunity to submit these comments on the Ruling and looks forward to continuing to work with the Commission and parties to arrive at a workable solution.

Respectfully submitted,

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