BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate and Refine procurement Policies and Consider Long-Term Procurement Plans	Rulemaking R.12-03-014 (Filed March 22, 2012)

MEGAWATT STORAGE FARMS - MOTION REGARDING THE LOADING ORDER AND STORAGE

October 5, 2012

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Introduction

Megawatt Storage Farms, Inc. ("MegaWatt") is a five-year-old company focused on developing large grid-scale storage facilities and providing advisory services regarding storage on the grid. MegaWatt is storage technology and application agnostic and works with many storage technology manufacturers and storage services customers.

David MacMillan, President and Co-founder of MegaWatt, is also a Charter Member of Energy Storage Advisory Committee and an elected Member of the Climate Prosperity Council, both part of Joint Venture Silicon Valley.

Dr. Ed Cazalet, VP and Co-founder of MegaWatt, is a former Board Member of the CAISO, appointed to a three year term by Governor Schwarzenegger in 2004. Dr. Cazalet is also President and Founder of TeMix, a company providing a software platform for dynamic end-user and distributed resources grid pricing and transactions.

Motion

Pursuant to Rule 11.1 of the California Public utilities Commission Rules of Practice and Procedure, MegaWatt Storage Farms, Inc. respectfully submits this motion requesting a ruling that Storage be ranked first in Loading Order priority.

With respect to this motion, we define storage ("Storage") as any system which has zero greenhouse gas emissions and whose primary purpose is all four of the following: (1) taking electricity in (charging), (2) storing that energy in any form (examples include electrochemically and mechanically), (3) delivering all of that energy (aside from efficiency losses) as electricity back to the grid (discharging) and (4) is installed close to load centers.

Our Motion does not cover CAES which emits GHG's (e.g. through use of natural gas generators to convert compressed air to electricity); does not cover hot water or cold storage that does not

deliver the bulk of its stored energy back to the grid in the form of electricity; and does not cover large scale pumped hydro where it cannot be located at or near the end user to support the states local reliability and distributed energy goals.[1]

Overview

We first present why there is a need for a decision on Storage's position in the Loading Order.

We then present why Storage should be first in the Loading Order.

There Is a Need for a Decision on Storage's Position in the Loading Order

AB2514 mandates that the CPUC decide on Storage procurement targets, so there is a statutory requirement that storage be considered.

The AB2514 Energy Storage Proceeding (R10-12-007) is looking to the present LTPP Proceeding for determination of grid resource requirements and to define a process for energy Storage to participate in utility procurement practices.[2]

The present LTPP proceeding is evaluating and deciding on quantities of resources to be procured, Storage being one such resource available for such procurement. The LTPP can't do its job properly unless it considers Storage.

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[1] The CPUC can of course make procurement decisions on these types of storage also. We simply note that they are very different in capabilities and have very different grid and environmental impacts, and hence are outside the scope of this Loading Order Motion.

[2] http://docs.cpuc.ca.gov/published//Graphics/171742.PDF Figure 1

The Loading Order sets the priority of each type of resource in meeting California's energy needs and is therefore an integral part of the LTPP procurement evaluation of needs and its decision on procurements.

Storage is not mentioned explicitly by name in the current Loading Order.

It is impossible for the LTPP Proceeding to analyze or decide on procurements unless a decision is made on Storage's ranking within the Loading Order.

The decision on Storage's position in the Loading Order should be explicit, not just "let the chips fall where they may", or made hidden from the light of day.

It is accordingly critical that a formal decision be made by this Proceeding about where Storage sits in the Loading Order.

Storage Should Be First In the Loading Order

The California Loading Order describes the priority with which resources are to be procured to address California's electricity needs. The Loading Order is:

> "First, the agencies want to optimize all strategies for increasing conservation and energy efficiency to minimize increases in electricity and natural gas demand.
>
> Second, recognizing that new generation is both necessary and desirable, the agencies would like to see these needs met first by renewable energy resources and distributed generation.

> Third, because the preferred resources require both sufficient investment and adequate time to "get to scale," the agencies also will support additional clean, fossil fuel, central-station generation."[3] [paragraph breaks added by MegaWatt for readability]

The following arguments each individually, and collectively, justify placing Storage first in the Loading Order.

Storage Reduces Natural Gas Needs for Renewables Integration

Storage reduces natural gas demand for integration of renewables by providing a means to handle the intermittency of wind and solar without needing to burn fossil fuels. Wind and solar are intermittent resources which can have sudden ramping of their outputs. This ramping can be unexpected and either up or down.

In order to ensure grid stability, a fast acting resource is needed to counteract the intermittency of these renewables. Traditionally the fossil fleet has been the primary means of dealing with this intermittency. A fossil plant must be running to provide fast reaction. During periods of high renewables output, the energy produced by the fossil plant is unneeded and wasteful. It is not uncommon to see energy prices go negative in today's market during periods of high renewable output. As we move to 33% RPS, these periods of negative pricing are likely to increase. If a fossil plant needs to run to provide immediate responsiveness, it is adding additional energy to the grid, which will tend to make prices even more negative. This wastes fossil fuel, adds unwanted GHG emissions, and is economically wasteful by driving prices negative, which adds to Ratepayers costs. Studies have shown that the rapid cycling of fossil plants to chase the

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[3] See *State of California Energy Action Plan* (2003), page 2, available at:
http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF
Also see *State ofCalifornia Energy Action Plan II*, September 21, 2005, page 2, available at:
http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF

intermittency of renewables can boost GHG levels dramatically.[4] In contrast, Storage has no GHG emissions. Storage can standby with neutral posture on the grid, neither charging nor discharging, but able to respond instantly (sub-second response.) If desired, the state of charge of Storage can be adjusted by charging and discharging during periods of excess or insufficient renewables output respectively, which serves to naturally counterbalance the intermittency of the renewables, and makes maximal use of the renewables output, all without any GHG emissions. Storage thus fits the first category criteria of the Loading Order of "conservation and energy efficiency to minimize increases in electricity and natural gas demand."

Storage can be located near the load and still support remote renewables as long as the renewables are not improperly located in a place where there is insufficient transmission to handle their peak generation.

Storage Reduces Natural Gas Needs for Frequency Regulation

Using the same logic as given above for renewables, Storage is a preferred resource for frequency regulation because it eliminates the need to cycle fossil plants to provide this service or to run fossil plants simply to allow them to respond quickly. Storage can also respond much faster than fossil plants to frequency regulation dispatch signals, which is why FERC has mandated pay-for-performance, which CAISO is now implementing. By doing a better job of responding to the dispatch signal, Storage does a better job of using available energy to meet the requirements of frequency regulation. This boosts energy efficiency and reduces natural gas consumption and GHG emissions as compared to the use of fossil fuel plants to provide frequency regulation. Accordingly, Storage fits the first category criteria of the Loading Order of "conservation and energy efficiency to minimize increases in electricity and natural gas demand."

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[4] Air Emissions Due To Wind And Solar Power Warren Katzenstein, and Jay Apt Environ. Sci. Technol., 2009, 43 (2), 253-258, DOI: 10.1021/es801437t, Publication Date (Web): 19 December 2008 http://pubs.acs.org/doi/pdf/10.1021/es801437t

Storage Promotes Energy Efficiency By Time Shifting

The use of Storage to time shift energy boosts conservation and energy efficiency multiple ways.

First Storage can capture high renewables output during periods of low load (e.g. high wind output at night), and deliver it back to the grid when the load is higher than renewables can provide. The alternative is to curtail the wind output, which is wasteful because it spills wind energy.

Second, when Storage used for the above task is located near load centers, there will also be additional energy efficiency from a reduction in transmission and distribution losses. The renewables energy can be moved from remote wind sites to the load center at night when transmission lines are lightly loaded, and discharged during the day to handle peak loading. Since transmission line losses increase with the square of the current, the savings can be dramatic - even a modest percentage of the energy time-shifted can result in big savings on losses.

Storage Does Not Fit Criteria Two or Three

Storage is not "new generation" or "fossil fuel, central station generation", hence it does not fall under the second or third category. Accordingly, and noting the previous discussion, Storage is properly placed in the first category.

Summary

There is a need for a decision of storage's placement on the Loading Order in order to allow the LTPP Proceeding to properly assess which portfolio of resources should be procured.

Storage's characteristics and capabilities clearly position it in the first category of the Loading Order. It also clearly does not fit the second or third category.

For all of the above reasons, we respectfully request that our Motion be granted.

Dated October 5, 2012

Respectfully submitted,

_____/s/_____

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