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.	)))	R.12-03-014 (Filed March 22, 2012)

RESPONSE TO MEGAWATT STORAGE FARMS MOTION ON BEHALF OF THE CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE AND THE CLEAN COALITION

DYANA DELFIN-POLK
KENNETH SAHM WHITE
2 Palo Alto Square
3000 El Camino Real, Suite 500
Palo Alto, CA 94306
Telephone: (831) 425-5866
dyana@clean-coalition.org;
sahm@clean-coalition.org

Representatives for the Clean Coalition

DEBORAH BEHLES
SHANNA FOLEY
CATHERINE DICKSTEIN*
NINA MELLER*
MABEL YEE*
Environmental Law and Justice Clinic
Golden Gate University School of Law
536 Mission Street
San Francisco, CA 94105
Telephone: (415) 442-6647
Facsimile: (415) 896-2450
dbehles@ggu.edu, sfoley@ggu.edu

Attorneys for California Environmental Justice Alliance

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* Certified law students under California State bar rules governing the Practical Training of Law Students working under the supervision of Deborah Behles.

RESPONSE TO MEGAWATT STORAGE FARMS MOTION ON BEHALF OF THE CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE AND THE CLEAN COALITION

The California Environmental Justice Alliance (CEJA) and the Clean Coalition (hereafter "Joint Parties") respectfully submit this response to Megawatt Storage Farms' October 5, 2012 motion to place energy storage in the loading order. The Joint Parties support this motion and urge the Commission move forward to place energy storage in the loading order as a preferred resource after energy efficiency and demand response. The Joint Parties also agree with Megawatt Storage Farms that energy storage that uses fossil fuel should not be included as a preferred resource. The Commission or the California Energy Commission could make a determination about what types of energy storage properly fit within the preferred resource category.

California's loading order requires the procurement of preferred resources prior to procurement of new natural gas facilities. Preferred resources were prioritized based on characteristics such as energy reduction, reducing dependence on fossil fuels, and having little to no emissions. Energy storage can provide the same characteristics. Additionally, energy storage increases the value of renewable energy by backing up intermittent renewables and avoiding the need for pollution-heavy peaker plants.

Energy storage is not only an important resource; it is an essential part of meeting our GHG goals and integrating renewables into the grid. Experts have found that energy storage is an important way to integrate renewables into the grid.[1] In contrast, if renewables are primarily backed up with conventional generation, emissions from peaker plants will compromise achievement of GHG reduction goals and continue to adversely impact communities already overburdened by air pollution. Despite the importance of energy storage in meeting California's energy goals, actual procurement of storage has been off to a slow start. If storage procurement

[1] 2020 Strategic Analysis of Energy Storage in California, Public Interest Energy Research (PIER) Program (Nov. 2011) at p. 179 http://www.energy.ca.gov/2011publications/CEC-500-2011-047/CEC-500-2011-047.pdf [Hereinafter 2020 Strategic Analysis].

and development continues at its glacial pace, it could sabotage the cleaner, more efficient grid that California has spent enormous sums on and worked for many years to build.

The Commission should take immediate steps to rectify this issue. Explicitly placing energy storage in the loading order as a preferred resource will help ensure that storage is being fully and adequately considered in all future procurement solicitations. Although it appeared that the Commission was planning to determine how energy storage fit into the loading order in R.10-12-007,[2] the Commission's recent decision failed to make a determination, provide a ruling, or even discuss the issue of energy storage and the loading order, except to confirm that it is an issue.[3] Especially because Track I includes the consideration of preferred resources in meeting any need found,[4] the Commission should consider how to ensure compliance with the loading order to achieve the optimum procurement of resources that reduce energy use and avoid the need for new fossil fuel facilities. As envisioned by the Energy Action Plan, the Commission can continue to work with other agencies in implementing the loading order.

The Commission should grant the motion of MegaWatt Storage Farms to place energy storage in the loading order. Energy storage should be placed after energy efficiency and demand response as a preferred resource.

1. The Loading Order Prioritizes Resources that Reduce Demand and Are Beneficial for the Environment.

The framework for the loading order is provided in the Public Utilities Code, which states that a utility "shall first meet its unmet resource needs through all available energy efficiency and demand response resources that are cost effective, reliable, and feasible."[5] The Code further

[2] Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge, at p. 4, R.10-12-007 (May 31, 2011); D.12-08-16 at p. 5; *see also* 2020 Strategic Analysis at p. 92 ("Many stakeholders in the energy storage proceeding under AB 2514 and in comments on this report have emphasized that inclusion of energy storage in the loading order in some manner will provide further guidance to state agencies and utilities to factor storage into long term procurement planning.").
[3] *See* D.12-08-16 at pp. 5, 10.
[4] Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge, at p. 5, R.12-03-014 (May 17, 2012).
[5] Cal. Pub. Util. Code § 454.5(b)(9)(C).

provides that "to fulfill its unmet resource needs, [a utility] shall procure resources from eligible renewable energy resources in an amount sufficient to meet its procurement requirements."[6]

Consistent with these statutory provisions, the loading order was adopted in the 2003 Energy Action Plan, which was developed by the Commission, the California Energy Commission (CEC), and the California Power Authority.[7] Recently, the Commission aptly summarized the history and function of the loading order:

> Adopted in the 2003 Energy Action Plan by the state energy agencies, the loading order establishes the preferred or priority set of resources and technologies on which the state should rely in the provision of energy services. The loading order identifies energy efficiency and demand response as the resources of first choice, followed by renewable energy, both distributed generation and utility scale, followed by clean fossil generation, if necessary. A number of state laws have codified or otherwise specified the loading order investments. For example, §454.5(b)(9)(C) requires utilities prioritize demand-side resources in meeting unmet resource needs, and the recent Senate Bill (SB) 2 (1x) (Simitian, Stats. 2011, Ch. 1) required 33% of energy need be met by renewable resources by 2020.[8]

As discussed in the Energy Action Plan, and its subsequent iterations, resources are included in the loading order based upon their environmental benefits, ability to reduce energy needs, and cost effectiveness. Energy conservation and efficiency resources are at the top of the loading order because they "minimize the need for new generation, reduce emissions of toxic and criteria pollutants and greenhouse gases, avoid environmental concerns, improve energy reliability and contribute to price stability."[9] As the 2008 Energy Action Plan Update further stated: "energy efficiency is also our most powerful strategy for addressing greenhouse gas emissions from the natural gas sector."[10] The Energy Action Plan also confirmed the connection between demand response and reducing pollution from peaking units that contribute

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[6] Cal. Pub. Util. Code § 454.5(b)(9)(A).
[7] 2003 California Energy Action Plan, California Public Utilities Commission et. al. (May 8, 2003) http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF.
[8] D.12-05-037 at pp. 13-14.
[9] 2003 California Energy Action Plan at p. 5.
[10] Energy Action Plan 2008 Update, at p. 7, California Public Utilities Commission et. al. (Feb. 2008) available at http://www.energy.ca.gov/2008publications/CEC-100-2008-001/CEC-100-2008-001.PDF

disproportionately to GHGs and local air pollution.[11] Renewables are included as a preferred resource because they can "reduce greenhouse gas emissions, moderate [the] increasing dependence on natural gas, and mitigate the associated risks of electricity price volatility."[12] When explaining why resources fit within the loading order, the Commission has repeatedly referenced the environmental benefits of preferred resources.[13] Thus, the loading order intended to include resources that benefit both the consumers and the environment.

2. Energy Storage Can Back Up Renewable Resources and Avoid the Environmental Impacts Associated With New Peaker Plants

Power plants adversely impact air, water, and land. Burning fossil fuels, such as natural gas, produces GHG and criteria pollutants that are harmful to human health such as ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, precursor organic compounds, and particulate matter.[14] Methane, a greenhouse gas, is emitted when natural gas is not burned completely or as a result of leaks and losses during transportation.[15]

As the State makes progress towards its renewable energy goals, the "need for additional production to 'firm' or 'shape' the electricity load will intensify significantly."[16] Thus, in order to backup renewables, operators are currently planning to startup and shutdown fossil fuel

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[11] Energy Action Plan 2008 Update, at p. 10 ("peaking units contribute disproportionately not only to greenhouse gas emission but to local air pollution because they operate during hot summer afternoons when local air quality can be poor. Thus, our emission reductions mandates clearly require the consideration of more demand response options to help meet our AB 32 goals.").

[12] State of California Energy Action Plan II at p. 5, California Public Utilities Commission et. al. (Sept. 21, 2005) http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF.

[13] D.04-12-048 at p. 195 (demand-side resources are preferred under the loading order because "they work towards optimizing energy conservation and resource efficiency while reducing per capita demand."); D.06-02-032 at p. 5 (purpose of the loading order is to, among other things, "minimiz[e] the energy sector's impact on climate change") (citing the Energy Action Plan); D.07-12-052 at pp. 4-5 (procurement of preferred resources under the loading order is important due to the reduction of carbon emissions).

[14] *See* California Energy Commission, Docket No. 08-AFC-3, Marsh Landing Generating Station: Commission Decision at p. 35 (Aug. 2010) http://www.energy.ca.gov/2010publications/CEC-800-2010-017/CEC-800-2010-017-CMF.PDF; *see also* Air Pollution: Health, Environmental, and Climate Impacts, Environmental Protection Agency http://www.epa.gov/airtrends/2010/report/airpollution.pdf

[15] Natural Gas, Environmental Protection Agency, (last updated: Oct. 17, 2012) http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html.

[16] The Power of Energy Storage: How to Increase Deployment in California to Reduce Greenhouse Gas Emissions, Berkeley Law / UCLA Law (July 2010) at p. 9 http://www.law.berkeley.edu/files/The_Power_of_Energy_Storage_July_2010_Update%281%29.pdf

facilities more often.[17] Problematically, pollutants from power plants are emitted at even higher rates during startup and shutdown of operation.[18] For example, the Marsh Landing Generation Station's turbine is permitted to emit up to 10 lbs/hr of CO during steady-state operation but up to 541.3 lbs/hr of CO during a simple-cycle startup.[19] The Russell City Energy Center gas turbines are permitted to emit up to 16.5 pounds of NOx per hour during regular operation but up to 480 pounds of NOx during a cold start.[20] By backing up intermittent renewable generation, storage can effectively reduce the frequency of startups and therefore drastically reduce power plants' pollution output.[21] For instance, a study by KEMA found that a 20 MW flywheel energy storage system emits 56% less CO_2 than a natural gas power plant providing regulation.[22]

Energy storage technologies also offer superior operational flexibility, which can reduce fossil fuel emissions. "[E]nergy storage resources can be synchronized and available to respond to dispatch instructions without minimum generation or emissions constraints," making them available at all times.[23] "Energy storage is an important enabling technology for a low-carbon

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[17] Integration of Renewable Resources: Technical Appendices for California ISO Renewable Integration Studies, at p. 63 (Oct. 11, 2010) available at http://www.caiso.com/282d/282d85c9391b0.pdf; (renewable integration "is likely to include more frequent starts, stops and cycling."); Summary of Preliminary Results of 33% Renewable Integration Study, California ISO, at pp. 43-45 (May 10, 2011) http://www.caiso.com/Documents/Summary_PreliminaryResults_33PercentRenewableIntegrationStudy_2010CPUCLongTermProcurementPlanDocketNo_R_10-05-006.pdf.

[18] *See e.g.,* California's Energy Future – The View to 2050, at p. 4, California Council on Science and Technology (May 2001) http://www.ccst.us/publications/2011/2011energy.pdf (finding that if fossil fuel plants are the predominant resource used to backup renewables, this "would likely result in greenhouse gas emissions that would alone exceed the 2050 target for the entire economy.").

[19] BAAQMD Final Determination of Compliance: Marsh Landing Generating Station, Application No. 18404 at pp. 16-17 (June, 2010) available at http://www.energy.ca.gov/sitingcases/marshlanding/documents/other/2010-06-29_BAAQMD_FDOC.pdf.

[20] PSD Permit, Application No. 15487 at pp. 9-10 (cold start-up occurs more than 48 hours after a gas turbine shutdown while hot start-up occurs within 8 hours of shutdown) available at http://www.baaqmd.gov/~/media/Files/Engineering/Public%20Notices/2010/15487/PSD%20Permit/B3161_nsr_15487_psd-permit_020410.ashx.

[21] Recommendation of the Economic and Technology Advancement Advisory Committee (ETAAC) Final Report: Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California, at p. 5-3 (Feb. 11, 2008) available at http://www.arb.ca.gov/cc/etaac/ETAACFinalReport2-11-08.pdf [Hereinafter ETAAC Final Report]; *see also* Electric Energy Storage, at p. 1, Pew Center on Global Climate Change (May 2009) available at http://www.c2es.org/docUploads/Energy-Storage-Fact-Sheet.pdf ("Electric energy storage (EES) technology has the potential to facilitate the large-scale deployment of variable renewable electricity generation, such as wind and solar power, which is an important option for reducing GHG emissions from the electric power sector.").

[22] KEMA, Emissions Comparison for a 20MW Flywheel-based Frequency Regulation Power Plant (May 18, 2007) available at: http://www.beaconpower.com/files/KEMA_Report_Emissions_Comparisons_July_%202007.pdf.

[23] Comments of the California Energy Storage Alliance on Administrative Law Judge's Ruling Seeking Comment on Workshop Topics, at Appendix A, p. 2, R.12-03-014 (Oct. 9, 2012).

electric power system, as most low-carbon energy technologies cannot flexibly adjust their power output to match fluctuating demand."[24] As the California legislature has found:

> Expanded use of energy storage systems will reduce the use of electricity generated from fossil fuels to meet peak load requirements on days with high electricity demand and can avoid or reduce the use of electricity generated by high carbon-emitting electrical generating facilities during those high electricity demand periods.[25]

In sum, storage technology can "spur monumental reductions in GHG emissions while altering the way that electricity is traditionally generated and consumed."[26]

3. Including Energy Storage as a Preferred Resource Meets the Purpose and Intent Behind the Loading Order.

The California legislature has codified the importance of energy storage as an integral part of meeting California's energy needs.[27] In particular, energy storage "can optimize the use of the significant additional amounts of variable, intermittent, and offpeak electrical generation from wind and solar energy that will be entering the California power mix on an accelerated basis."[28] It can also reduce ratepayer costs by avoiding new fossil fuel plants and transmission projects,[29] and reduce dependence on fossil fuel resources.[30] Other state policies, such as the Governor's Clean Energy Jobs Plan, reiterate the importance of constructing energy storage resources.[31]

California needs to take affirmative steps to ensure that energy storage is integrated into its grid. Other states, including New York, Tennessee, and Hawaii have begun to develop energy storage facilities.[32] The international community has been successful in implementing energy storage facilities into their electrical grids as well. For instance, China, Germany, and

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[24] Energy Storage for Low-Carbon Electricity, at p. 4, Climate Change Policy Partnership (Jan. 2009), available at: http://www.nicholas.duke.edu/ccpp/ccpp_pdfs/energy.storage.pdf.
[25] Assembly Bill No. 2514 Section 1(d) available at http://www.leginfo.ca.gov/pub/09-10/bill/asm/ab_2501-2550/ab_2514_bill_20100929_chaptered.pdf.
[26] ETAAC Final Report at p. 5-3.
[27] *See* Cal. Pub. Util. Code § 2835 et. seq.
[28] AB 2514, Section 1 (b).
[29] Cal. Pub. Util. Code § 2837(e).
[30] Cal. Pub. Util. Code § 2837(c).
[31] Clean Energy Jobs Plan, available at http://www.energystorageexchange.org/projects
[32] DOE Energy Storage Database, available at http://www.energystorageexchange.org/projects.

Australia currently have energy storage facilities online.[33] Although utilities in California have begun developing energy storage resources,[34] more development needs to occur to integrate renewables onto the grid. The CEC has found that to integrate renewables into the system fast acting energy storage may be required by 2020.[35]

In light of these requirements and projections, energy storage should be included in the loading order as a preferred resource. Storage should be considered consistent with other renewable energy sources after energy efficiency and demand response. Energy storage resources are both cost effective and conserve energy because they do not require generation of new energy, and instead, capture high renewable outputs and conserve them for future need.[36] Additionally, energy storage can minimize energy lost due to transmission and distribution by shifting transmission to off-peak periods when lines are less loaded.[37] Moreover, the inclusion of energy storage in the loading order naturally furthers the policy and purpose behind the loading order's intent to reduce dependence on fossil fuels. Energy storage expansion will further integration of renewables and reduce GHG emissions from fossil fuel resources. Thus, energy storage helps meet energy demand by reducing the need for additional generation and conserving energy for future use. In conclusion, the cost effectiveness and environmental impact of energy storage complies with the intent of the loading order, and thus it should be included in the loading order.

For these reasons, the Joint Parties urge the Commission to consider energy storage as a preferred resource in the loading order at the level of renewable resources.

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[33] DOE Energy Storage Database, available at http://www.energystorageexchange.org/projects.
[34] DOE Energy Storage Database, available at http://www.energystorageexchange.org/projects.
[35] 2020 Strategic Analysis at p. 6.
[36] *See The Power of Energy Storage: How to Increase Deployment in California to Reduce Greenhouse Gas Emissions*, Berkeley Law / UCLA Law (July 2010) at p. 9, available at http://www.law.berkeley.edu/files/The_Power_of_Energy_Storage_July_2010_Update%281%29.pdf.
[37] *Id.* at pp. 10-11.

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Respectfully submitted,
/s/ Shanna Foley

SHANNA FOLEY
DEBORAH BEHLES
Environmental Law and Justice Clinic
Golden Gate University School of Law
536 Mission Street
San Francisco, CA 94105-2968
(415) 442-6647 (Telephone)
dbehles@ggu.edu, sfoley@ggu.edu

Attorneys for
CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE

DYANA DELFIN-POLK
KENNETH SAHM WHITE
2 Palo Alto Square
3000 El Camino Real, Suite 500
Palo Alto, CA 94306
Telephone: (831) 425-5866
dyana@clean-coalition.org;
sahm@clean-coalition.org

Representatives for THE CLEAN COALITION