BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems.	Rulemaking 10-12-007 (Filed December 16, 2010)

OPENING COMMENTS OF THE CONSUMER FEDERATION OF CALIFORNIA ON THE ADMINISTRATIVE LAW JUDGE'S RULING ENTERING INITIAL STAFF PROPOSAL INTO RECORD AND SEEKING COMMENTS

Nicole A. Blake, Staff Attorney

CONSUMER FEDERATION OF CALIFORNIA
1107 9th Street, Suite 625
Sacramento, CA 95814
(916) 498-9608
blake@consumercal.org

Table of Contents

I. INTRODUCTION

Pursuant to the December 16, 2011 Administrative Law Judge's Ruling *Entering Initial Staff Proposal into Record and Seeking Comments* ("Ruling"), Consumer Federation of California ("CFC") respectfully submits opening comments to the Energy Division's *Energy Storage Framework Staff Proposal* ("Staff Proposal").

II. SUMMARY OF STAFF PROPOSAL

CFC appreciates the Commission's commitment to move forward in identifying and helping to resolve issues related to Energy Storage. The Staff Proposal generally represents the Commission's effort to balance the needs of stakeholders while recognizing the importance of fully analyzing barriers and impediments before adopting widespread use of Energy Storage.

The Commission Staff Proposal incorporates parties' wide range of "distinct challenges for consideration" which the Staff Proposal has grouped into nine categories. The nine categories are:

1. Lack of definitive operational needs
2. Lack of cohesive regulatory framework
3. Evolving markets and market production definition
4. Resource Adequacy accounting
5. Lack of cost-effectiveness evaluation methods
6. Lack of cost recovery policy
7. Lack of cost transparency and price signals (wholesale and retail)
8. Lack of Commercial operating experience.
9. Lack of well-defined interconnection process.

In addition, the Staff Proposal identified "Next Steps," upon which parties were asked to respond. The "Next Steps" identified were in the categories of 1) Regulatory Framework 2) Cost-Effectiveness 3) Roadmap and 4) Procurement objectives. CFC is pleased to offer following comments on both Regulatory Framework and Cost-Effectiveness categories below.

III. GENERAL COMMENTS

A. Energy Storage Systems Must Be Cost Competitive.

CFC believes in the benefits of energy storage. However, identifying benefits of a technology is not enough when deciding to invest in this emerging technology. Energy storage is

expensive and may be an investment that is ultimately borne by utility ratepayers. California ratepayers are stakeholders in this investment and need assurances that Energy Storage will result in lower utility bills and better energy management and efficiency. Adopting Energy Storage Technologies will eventually boil down to these questions: Are these technologies cost competitive? Will energy storage be more efficient than other viable energy management substitutes at a lower cost? These should be the fundamental questions asked when developing a regulatory framework for Energy Storage Systems ("ESS").

1. Energy Storage Technologies Is Not A Cure-all For Existing Energy Management Program Inadequacies

There are cases where the upfront cost capital of ESS may make these technologies less cost competitive. There are also other cases, such as electric vehicles car charging, where due to a potential reduction in the price delta between on-peak and off-peak energy prices, employing energy storage may result in higher TOU rates, therefore resulting higher energy bills for ratepayers. The Commission should prepare to resolve this issue before widespread adoption of storage.

B. A Valuation Framework for Energy Storage Applications Should Be Included In The ESS Cost-Effectiveness Analysis.

As mentioned in earlier comments, quantifying ESS is essential before committing to certain energy storage investments. Consequently, CFC believes that a valuation methodology for ESS applications and services that properly characterizes and monetizes benefits should be included in the cost-effectiveness framework before making a decision to invest in certain energy storage technologies. Having a valuation framework for EES benefits will answer the proverbial question "What is it worth?"[1] so that Energy Storage stakeholders can then ask the next question: Is this investment economically feasible?

A Valuation Framework of Energy Storage Systems Applications can be done by creating metrics and employing these metrics to come up with benefit valuations for different ESS applications and services. The Commission should employ a combination of different

[1] Energy Storage Technology Valuation Primer: Techniques for Financing Model, at 1-1

valuations methodologies in order to come up with a singular framework that "addresses the multiple values and potential overlapping nature of energy storage's benefits."[2] The EPRI paper entitled *Electricity Energy Storage Technology Options* offers an analytical approach to valuing ESS benefits by comparing different assumptions to calculate a net present value of ESS technologies and applications.[3]

In addition, the Commission should employ PURPA's analytical approach to valuation, which is the avoided cost model. Under PURPA, the utility is required to purchase power from Qualified Facilities where the cost is less than if the utility generated the energy itself. Although there may be flaws to using PURPA's approach, it will serve as another perspective in valuing benefits.

Lastly, because ESS technologies and the services they perform are in a fledgling stage, properly valuing ESS while there are so many uncertainties is a classic conundrum. The analytical approach used to value benefits should "remove uncertainty from the valuation estimates for later investments."[4] The whitepaper entitled *Energy Storage Technology Valuation Primer: Techniques for Financing Model* introduces a model to minimize uncertainty in valuation estimates.

1. Calculating Net Benefits Is Paramount When Investing In Energy Storage.

Stakeholders initially calculating benefits for storage may initially calculate the gross benefits without factoring in cost estimates. CFC understands that this initial analysis may be necessary to get an idea of the full capabilities of a particular storage system in an idealized scenario. However, CFC believes that in order to make a sound, realistic decision when choosing a particular ESS technology, especially if ratepayer money is at stake, it is crucial that net benefits are calculated before investing in ESS technologies.

C. ESS Cost Recovery Model Should Minimize Opportunities For Double Or Multiple Counting of Energy Storage Investments.

---

[2] http://www.energy.ca.gov/2011publications/CEC-500-2011-047/CEC-500-2011-047.pdf at 109.
[3] Electricity Energy Storage Technology Options, at 2-11.
[4] Energy Storage Technology Valuation Primer: Techniques for Financing Model, at 1-1

Energy Storage is connected to so many other proceedings and therefore may be included other proceeding's recovery mechanisms. The ESS tentacles may extend to proceedings dealing with Permanent Load-Shifting, Demand Response, Self-Generation Incentive Program, Resource Adequacy, Dynamic Pricing, Electric Fueled Vehicles, Long-Term Procurement Planning, etc. As a result, it is possible that IOUs may include Energy Storage in other areas of cost-recovery. Because energy storage can serve many purposes, it is necessary that the Commission formulates a cost recovery model that minimizes double or multiple counting of Energy Storage investments so that IOU's only recover once for their ESS investment.

IV. DISCUSSION

A. Regulatory Framework

The Staff Proposal seeks input on whether there are other proceedings, aside from the proceedings included in the Staff Proposal's Regulatory Matrix, that have an impact on electric energy storage. CFC identified potentially two other cases as well as another area that have an impact on energy storage. These cases are:

1. Electric Fueled Vehicles (CPUC Docket #09-08-009)
2. The Smart Grid (CPUC Docket # 08-12-009)
3. Other Area: Time-Variant Pricing Programs

1. Electric Fueled Vehicle Proceeding

The large-scale deployment of Electric Fueled Vehicles can have a fundamental impact on the energy storage market, particularly on on-peak/off-peak pricing when charging electric vehicles. It is argued in "Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide," the usage of utility-related storage can reduce the price differential between on-peak and off –peak energy to an extent that could limit the benefits of utility related storage for some uses. Specifically, the paper states:

> Although the implications for energy storage generally are somewhat unclear, the expected proliferation of plug-in electric vehicles (PEVs) and plug-in hybrid electric vehicles (PHEVs) could have a significant impact on the potential for utility-related storage. One possibility is that purchases of off-peak energy to charge storage will increase off-peak energy prices enough to reduce the benefit

for some uses of utility-related storage, especially energy time-shift and TOU energy cost reduction.[5]

This potential for an off-peak energy price increase should be taken into consideration as it could potentially have negative impact on grid function and utility rates.

2. Smart Grid

The Commission's Smart Grid proceeding initiated in response to SB17. D. 10-06-047 in the Commission's Smart Grid proceeding enumerated how energy storage will be a crucial element of an effective "Smart Grid." Specifically, the Decision instructs the IOU's on preparing Smart Grid Deployment plans, stating that the purpose of the Smart Grid is to "enable the integration of higher levels of renewable energy, energy storage, and, eventually, electric vehicles, at a lower cost to consumers"[6] The Decision also lists "Accommodate all generation and energy storage options" as the Commission's Smart Grid policy goals consistent with the initiatives and policies of SB 17. [7] In addition, one of goals of a smart grid is to enable effective integration of renewables and integration and the dispatch of distributed resources, which can be made possible through incorporating energy storage.

a. How Smart Grid will impact Utility-related storage vs. Customer-Related storage

The *2020 Strategic Analysis of Energy Storage in California* whitepaper makes the argument that the implementation of Smart Grid may mean utilities will be less reliant on storage while residential and commercial customers will find storage beneficial:

> The deployment of Smart Grid, a network of interconnected electronically enhanced and digitally communicated and controlled electricity generation and transmission and distribution systems, in California may both improve and

[5] "Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide," at 144.

[6] D.10-10-047 at 2.

[7] Id. at 133.

> lessen the need for energy storage. Because utilities may be able to reduce end-user load with the new, smarter technology, they may not require energy storage to shave peak load or maximize the efficiency of renewable energy electricity production. As customers, particularly from the business and industrial sectors, access real-time pricing information and identification of periods of peak electricity rates, they may consider purchasing on-site distributed energy storage systems, particularly batteries, to avoid peak charges.[8]

Because Smart Grid will directly influence the adoption and deployment of energy storage, it is important that the Smart Grid proceeding is included in the Staff Proposal's regulatory matrix.

3. Other Areas: Time-Variant Pricing Programs

Energy storage will play a role in potentially shifting energy prices. This will have an impact on related cases dealing with time variant pricing, such as TOU pricing. As mentioned earlier using the example of electric vehicle charging, the usage of electric storage may cause an increase in off-peak energy prices, potentially raising rates. The Commission should address and decide ways of avoiding this issue.

B. Cost-Effectiveness

CFC agrees with the Commission that a cost-effectiveness framework using an application and operational use approach is preferable. CFC believes that the benefits of energy storage do not lie solely in the physical technology itself but in how these technologies are used or applied. With that said, CFC also believes that because demand of certain technologies may vary or that there is potential for overlap of applications and technologies, widespread adoption to energy storage may be susceptible to wasteful spending. As a result, CFC believes that there should be more than one cost-effectiveness approach that encapsulates different perspectives, variables, and assumptions, to reduce the level of uncertainty when estimating value.

1. More Than One Cost-effectiveness Test Should Be Used Before Justifying an Energy Storage Investment

[8] http://www.energy.ca.gov/2011publications/CEC-500-2011-047/CEC-500-2011-047.pdf , at 6-7.

Because cost-effectiveness tests in the *Standard Practice Manual: Economic Analysis of Demand-side Programs and Projects* ("Standard Practice Manual") provide different vantage points by which to evaluate energy storage projects, it is important to employ more than one test in order to capture these diverse perspectives. CFC believes that using multiple tests for ESS will provide a holistic approach to figuring out whether certain ESS is balanced and effective.

2. Certain Cost Effectiveness Tests May be Optimal Depending on the Energy Storage Application; Different Applications May Need Different Cost-Effectiveness Methodologies.

The Standard Practice Manual provides 4 (plus the Societal Test) different cost-effectiveness tests. Within each description of particular tests, the Standard Practice Manual matches particular demand side programs with certain tests. As a result, some tests may be more optimal for a particular program than others. Certain ESS applications serve certain demand-side project goals. Certain cost-effectiveness tests are optimal depending on the demand-side project goal. As a result, it makes sense that different cost-effectiveness tests may be better depending on the ESS application.

3. Analysis of Tests Found In The Standard Practice Manual.

The Standard Practice Manual identifies costs and benefits of projects and cost-effectiveness methodologies through essentially five tests. The different tests represent different perspectives and are categorized as the 1) Participant test 2) Ratepayer Impact Measurement Test 3) Program Administrator Cost Test 4) Total Resource Cost Test 5) Societal test, which is sometimes considered an extension of the Total Resource Cost Test.

The Energy Division Staff Proposal identifies these tests as potential ways to calculate cost-effectiveness and requested that parties comment on the specific tests.

CFC advocates that the Ratepayer Impact Measurement test be used for all ESS applications in addition to other cost-effectiveness tests for particular ESS applications.

a. Participant Test May be Used for Utility Customer Applications, And Applications That Are Used in customer-side voluntary programs.

The Participant Test is an appropriate test to use for utility customer Energy Storage Applications, such as demand charge management applications and Time-of-Use Energy Cost Applications. The cost and benefit components are through a customer's participation in a particular demand-side project, including impact on customer bills and customer out-of-pocket costs. Because demand charge management and TOU energy cost applications may involve a customer's voluntary participation, the Participant test can measure cost-effectiveness through a customer's/participant's perspective.

b. Ratepayer Impact Measurement Test Should Be One of the Tests Used For All ESS Applications Before Investing.

CFC advocates using the Ratepayer Impact Measurement (RIM) test as a chief test used for all ESS applications and services. The RIM is a cost-effectiveness test through the perspective of the ratepayer. Generally, the benefits calculated are through avoided cost supply and increase in revenues, while the costs are calculated by utility costs, incentive costs, and revenue loss. The RIM test is the only test that reflects direct shift in revenues as a result of employing an energy management program. In addition, it is the only test that can be used for all demand-side management programs. ESS applications can serve most demand-side management program goals. This means that this test can be employed for ESS applications that involve 1) Electric Supply Applications 2) Ancillary Services Applications 3) Grid System Applications 4) End User/Utility Customer Applications 5) Renewables Integration Applications 6) Distributed Energy Storage Applications , etc. Since Ratepayers will potentially represent a significant stake in energy storage investments, it is important that a test is used to capture the impact on rates.

c. Cost-Effectiveness Framework Should Include More Than the Total Resource Cost Test.

The Total Resource Cost Test (TRC), which sometimes encompasses the Societal Test, is a Commission accepted cost-effectiveness test for demand-side management programs.

However one of the weaknesses of this test is treating revenue shifts and incentives paid to participants as transfer payments instead of recording it as a loss in revenue. Consequently, these results may not accurately reflect impacts on utility customers' rates. As a result, the

Commission should not solely rely on this cost-effectiveness approach when coming developing a cost-effectiveness framework for energy storage.

Dated January 31, 2012

Respectfully Submitted,

_____/s/_____,

Nicole A. Blake
1107 9th Street, Ste. 625
Sacramento, CA 95814
Phone: (916) 498-9608
Fax: (916) 498-9623
Email: blake@consumercal.org