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)

COMMENTS OF 1ENERGY SYSTEMS, INC.

Tom Melling
Vice President, Operations
1Energy Systems, Inc.
811 First Ave., Suite 263
Seattle, WA 98104
Telephone: 206-930-7099
Email:
tomm@1Energysystems.com

For 1Energy Systems, Inc.

July 3, 2013

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)

COMMENTS OF 1ENERGY SYSTEMS, INC.

I. INTRODUCTION

1Energy Systems, Inc. ("1Energy") appreciates this opportunity to file comments on the June 10, 2013 Assigned Commissioner's Ruling Proposing Storage Procurement Targets and Mechanisms and Noticing All-Party Meeting in rulemaking docket 10-12-007 ("ACR"). 1Energy submits the following comments to the California Public Utilities Commission ("Commission") in accordance with the provisions of the June 10 ruling by Commissioner Peterman.

II. COMMENTS

1Energy is a software company located in Seattle, Washington. Using the power of software, 1Energy helps utilities deploy, manage, and dispatch energy storage and other distributed resources to integrate renewable energy and provide cleaner, cheaper, and more reliable electricity.

The ACR proposed by the Commission is important – it is the first concerted effort to bring grid-connected storage to scale. However, the scale required cannot

be achieved by one-off project engineering, which is today's dominant practice. To truly achieve market transformation, open, non-proprietary standards are required at physical, electrical, communications and software levels. The Commission can help remove this barrier to market transformation in its ACR by (1) identifying and highlighting the barrier; and (2) incenting utilities to encourage and use, and the energy storage industry to adopt, non-proprietary standards for constructing and integrating energy storage assets.

A. Lack of Standards is a Significant Market Barrier

1Energy appreciates that the Commission has identified barriers to the widespread use of storage technologies, and also appreciates the Commission's effort to address some of these barriers in an effort to bring grid-connected energy storage to utility scale. Furthermore, 1Energy supports the ACRs' overall goal of market transformation in the energy storage space. However, an equally important impediment not yet addressed in the ACR is the fact that the energy storage industry does not have open, non-proprietary physical, electrical, or communications standards for building energy storage, nor standards for connecting energy storage to utilities' IT/OT systems, both of which lead to higher costs and less flexible energy storage projects. The lack of standards impedes the energy storage industry's ability to provide interoperability, modularity, and scalability.

We have received consistent feedback from utilities and energy storage suppliers about the importance of establishing the physical, electrical, and communications standards described above. For example, this is a typical comment from an energy storage supplier: "It is a very engineering intensive exercise to design and build each project, regardless of the size." Ultimately, the technology industry (i.e. storage suppliers) cannot hope to address utility customers' needs without adequate standards -- buying storage should be like buying transformers.

The importance of standards for the PC industry is a good analogy. The size, scale, and diversity of the computer industry are largely due to similar standards for hard drives, keyboards, memory, etc. Standards enable the best-of-breed components to work together to make a better overall system, at lower cost. As with the computer industry, open standards would enable the energy storage industry to achieve modularity, interoperability, scale, growth, and reliability.

Furthermore, standards need to emerge to facilitate connections between grid-connected ESS(s) and utility IT software such as SCADA, DMS, historian, power scheduling, etc. Grid operations are highly complex, and must be extremely reliable. Creating a custom connection for a proprietary energy storage system is difficult, and the prospect of connections to multiple proprietary systems is simply not feasible or manageable at scale.

In summary, the lack of standards for the industry is currently a market barrier to the widespread growth of energy storage. Moreover, standards are generally not emerging. While utilities and suppliers recognize the barrier, there is little apparent activity to facilitate change because suppliers view their project-specific design and engineering work as proprietary. Consequently, growth in the energy storage market is limited, despite willing buyers and sellers. As discussed below, what is needed is greater awareness of and support for the development of open, non-proprietary standards.

B. Utilities Want a Functional, Cost-Effective Supply Chain with Multiple Providers

Recognizing the needs of utilities is critical to the goal of market transformation and growth. Utilities want to operate, maintain, upgrade, and expand energy storage assets in the same way they manage other equipment (such as replacing or installing a transformer). Furthermore, they want an extensible infrastructure that is simultaneously generic (not tied to a single supplier) and customizable such that it can be tailored to their specific situation. In other words, utilities want an organized supply chain, with multiple providers, to increase reliability and lower costs.

C. MESA (Modular Energy Storage Architecture) – An Initiative to Demonstrate and Promote Non-Proprietary Energy Storage Standards

In 2012, 1Energy and Public Utility District No. 1 of Snohomish County (the "Snohomish PUD") launched the Modular Energy Storage Architecture (MESA)

initiative. Specifically, the Snohomish PUD is funding the construction of a one-megawatt, one-megawatt hour energy storage system at a Snohomish PUD substation, in which all the project suppliers are working together to define communication protocols and publish them in the public domain for the benefit of the industry and the development of standards. Some of the other entities and suppliers who are part of this public-private collaboration include the University of Washington, Alstom Grid, Parker Hannifin, and to-be-named battery companies. The goal of this project and the MESA initiative is to help the industry to develop a set of open standards that will move the energy storage market toward component-based solutions that are more scalable and cost-effective than current offerings.

Steve Klein, General Manager of the Snohomish PUD, describes the importance of this effort to build the first non-proprietary plug-and-play energy storage system:

> "[The MESA energy storage project] will bring major equipment and software companies together to establish the appropriate industry standards and interfaces to make storage more economically and operationally viable for the entire electric utility industry. This approach is much different than other energy storage projects in the past and should result in the expanded application of plug-and-play type energy storage systems to help solve the

expanding needs of today's electric grid that depends more and more on intermittent resources such as wind and solar." [1]

The Snohomish PUD has committed to meeting all its future load growth through conservation and renewable energy. MESA-based energy storage gives the utility an effective means to integrate intermittent renewable energy into its power portfolio, and reduce the cost to ratepayers of deploying clean energy.

The suppliers working on Snohomish PUD's MESA storage system are developing both inside-the-box and external communication standards. The inside-the-box standards are the software communications within the energy storage system itself – i.e. the communication between the energy storage software control system, battery(ies), power conversion system(s), and the balance of system (components such as HVAC, fire suppression, etc.). These are shown as the blue interfaces in Figure 1 below. Externally, MESA standardizes connections between grid-connected ESS(s) and utility IT software such as SCADA, DMS, historian, power scheduling, etc. – see the green interfaces in Fig. 1. An optional MESA-compliant software system can manage groups of ESS or other assets, delivering an aggregated energy resource to the utility or other grid operator.

[1] Snohomish Press Release, December 4, 2012, <http://www.snopud.com/newsroom.ashx?173_na=211>

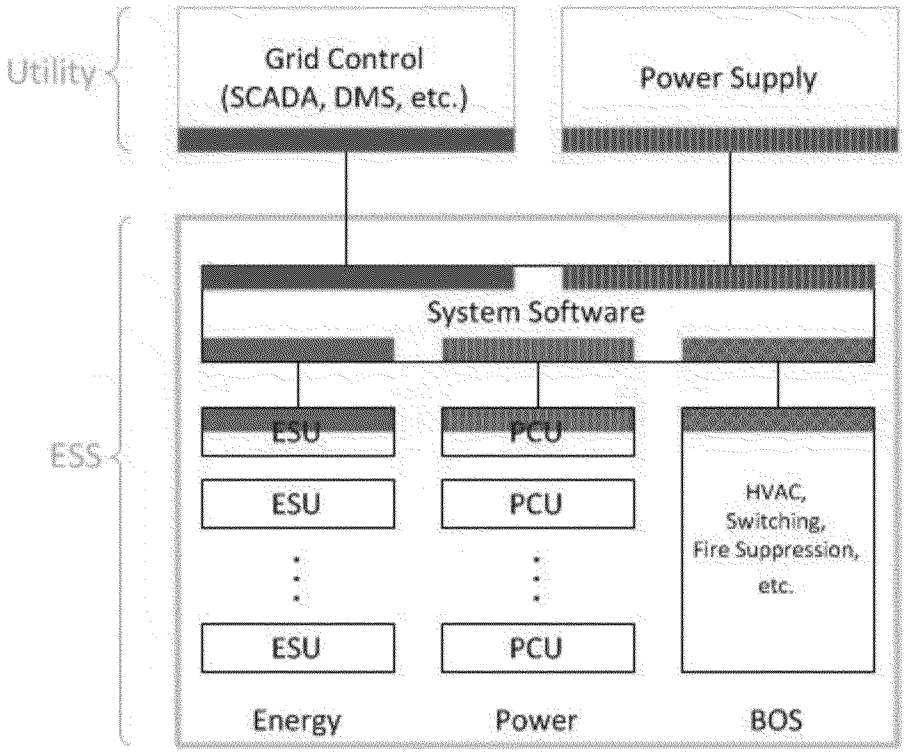

Figure 1

As part of the standards creation, the MESA team is working with standards bodies, such as the IEEE 2030.2 Energy Storage Working Group, and IEC TC-120 Electrical Energy Storage (EES) Systems. Based on input from other interested parties, the MESA team intends to reach out to other organizations and standards bodies that relate to energy storage.

Once these standards are complete, the parties involved in the MESA project will put the MESA standards into the public domain so that the entire industry will benefit from the communications protocols and learning from this project.

The MESA project demonstrates how the Commission can support the growth and development of standards for the energy storage industry. To be clear, the

Snohomish PUD itself is not specifying standards, but merely pursuing a standards-based approach to energy storage. This has created awareness and discussion within the industry about the importance of standards to foster the growth of energy storage.[2]

D. Recommended Actions by the Commission

As a matter of policy, the Commission should not itself play a role in specifying technical standards for the storage industry. Nevertheless, similar to the Snohomish PUD, the Commission can play a significant role to encourage and promote the industry's adoption of standards.

First, the Commission can identify the lack of electrical, physical, communications, and software standards as a barrier that is limiting the growth of energy storage. For example, it should update its list of barriers discussed in Phase 1 of this proceeding as indicated in bold below:

1. Lack of definitive operational needs;

---

[2] *E.g.,* Jeff St. John, *Plug-and-Play Grid Batteries Thanks to 1Energy's Software*, GreenTechMedia (May 23, 2013) <http://www.greentechmedia.com/articles/read/1energy-and-the-software-for-plug-and-play-grid-batteries >; Robert Marritz, *Snohomish PUD, partners pioneer to develop modular storage architecture, ElectricityPolicy.com* (February 20, 2013) <http://www.electricitypolicy.com/news/5264-snohomish-pud,-partners-pioneer-to-develop-modular-storage-architecture>; John Wolcott, *Snohomish PUD (WA) tackles standardization of storage and related software,* Electricity Storage News (January 30, 2013) <http://www.electricitystoragenews.org/articles/719319/snohomish-pud-wa-tackles-standardization-of-storag/> (first published in HeraldNet.com). The Snohomish PUD is also speaking frequently about its goal to transform the energy storage industry by deploying a plug-and-play energy storage system using the MESA standards. For example, a copy of its presentation to the Northwest Power and Conservation Council on February 13, 2013 can be viewed at <http://www.nwcouncil.org/media/4440903/mesa.pdf>

2. Lack of cohesive regulatory framework;

3. Evolving markets**, ~~and~~** market product definition **and technology standards**;

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; and

9. Further define the energy storage interconnection process **and standards**.

In addition, the Commission should encourage utilities to consider implementing projects based on open, non-proprietary standards in their procurement processes. Specifically, the Commission's ruling for storage procurement targets should require utilities to consider the applicability and benefit of standards-based storage in the procurement of utility-owned energy storage and third party-owned energy storage. To be clear, however, utilities should have the sole responsibility to decide what technologies they decide to deploy, and what standards are appropriate, if any, for a particular project. Nevertheless, the mere consideration of how a standards-based approach would benefit a utility's long-term operations as well as the organization and growth of the energy storage supply chain will drive significant focus on the standards issue

and benefit the industry as a whole.

DATED this 3rd day of July, 2013, at Seattle, Washington.

Respectfully submitted,

_____/s/_____Tom Melling_____
Tom Melling
1Energy Systems, Inc.
811 First Ave., Suite 263
Seattle, WA 98104
Telephone: 206-930-7099
Email: tomm@1Energysystems.com

For 1Energy Systems, Inc.