

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY POLICY & INNOVATION

June 11, 2010

Reference: Request for Comments Regarding Rates, Accounting
and Financial Reporting for New Electric Storage Technologies
Docket No. AD10-13-000

Dear Reader:

Pursuant to authority delegated to the Director, Office of Energy Policy and Innovation, under 18 C.F.R. § 375.315, comments are requested in the above-referenced docket regarding rates, accounting and financial reporting associated with services provided by electric storage technologies.¹

Commission staff has been considering the growing interest in the use of non-traditional technologies to help meet the Nation's electricity needs. In particular, newer storage technologies like flywheels and chemical batteries have recently achieved technological maturity and are well into successful pilot stages and, in some cases, commercial operation. The roles of traditional generation, transmission, and distribution assets within the electric system are well understood and each has set method(s) of rate recovery, accounting and financial reporting. However, the same is not necessarily true of electric storage.

Under appropriate circumstances, storage can act like any of the traditional asset categories, and also like load. The only electricity storage technology that has been widely adopted to date, pumped storage hydropower, was generally built at a time when the majority of utility assets were constructed by vertically integrated load-serving utilities at retail ratepayer expense. In many parts of the country today, entities other than vertically integrated load-serving utilities have expressed interest in building and owning electric storage assets of varying sizes. Suggested business models range from traditional cost-of-service rates to competing in wholesale commodity trading; some are considering the possibility of multiple revenue streams which may blend both cost-of-service recovery for some costs with other costs being at risk in competitive wholesale market

¹ **The statements herein do not necessarily reflect the views of the Commission.**

transactions. For all of these reasons, there is little case precedent to guide industry and a divergence in practice concerning how to develop rates and categorize electric storage costs for rate purposes.

Further, the Commission's accounting² and financial reporting requirements³ currently do not contain specific accounting, functional classification, and related FERC Form No. 1 reporting requirements for new storage technologies. Under a cost-of-service ratemaking methodology, it is critical for companies to accurately and uniformly account and report financial information and data to facilitate the development and monitoring of rates. Without this information, it would be difficult for the Commission and others to determine the costs related to new storage technologies for cost-of-service rate purposes.

In order to better understand the various ways electric storage can be used, where each of those uses would fall within established jurisdictional boundaries, and the appropriate rate treatment, accounting classification, and reporting requirements for those uses, Commission staff seeks comment on the attached document regarding alternatives for categorizing and compensating storage services, and in particular ideas on how best to develop rate policies that accommodate the flexibility of storage, consistent with the Federal Power Act.⁴ In addition, staff welcomes comments about any other aspects of these storage issues not specifically raised in the attachment.

Persons wishing to comment on the matters discussed herein should submit comments to the Commission no later than 45 days after the publication of this notice in the Federal Register. Comments should reference Docket No. AD10-13-000. For further information, please contact:

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² 18 C.F.R. Part 101 (2009).

³ 18 C.F.R. Part 141 (2009).

⁴ 16 U.S.C. §§ 791a – 825r (2006).

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Thank you,

Jamie Simler, Director
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Potential Approaches to Categorizing Storage Service for Compensation Purposes¹

To determine what, if any, Commission-jurisdictional rate structure is appropriate for a given electric storage asset, staff has attempted to identify the chief electric system uses of storage. Staff believes that the chief electric storage uses implicating Commission jurisdiction are: 1) maintaining service to unbundled transmission customers; 2) enhancing the value of generation; and 3) providing ancillary services.² Below staff reviews compensation structures available for these uses of storage, as well as the possibility of creating a stand-alone contract storage service. Staff seeks comment on the ideas contained throughout and in particular on the following issues:

- The circumstances in which a storage provider can be classified and receive compensation as a transmission asset.
- The circumstances, if any, under which a storage project should be permitted to receive compensation as transmission and also receive compensation for enhancing the value of merchant generation or providing ancillary services.³
- Whether creation of a stand-alone contract storage service should be considered and in particular, the possibility that a storage provider would provide only the service of electricity storage and leave it to its customers to determine how to use their contracted share of the storage device.
- Whether new accounting and reporting requirements need to be created in order to facilitate cost of service ratemaking for these new storage technologies.

¹ **The statements herein do not necessarily reflect the views of the Commission.**

² These uses are exclusive of the service storage may provide to retail load.

³ Some new technologies have the potential to respond to frequency deviations in the transmission system faster than other (traditional generation) resources. At the May 26, 2010 technical conference in Docket No. AD10-11-000, the Commission staff explored issues relating to frequency compensation in the organized wholesale power markets, including whether there are benefits to be gained from linking compensation for frequency regulation service to the quality of the service provided.

I. The Uses of and Rate Treatment for Storage Facilities

1. Maintaining Service to Unbundled Transmission Customers

Some storage technologies can be used to support unbundled transmission service by supplying reactive power or possibly by acting as a virtual replacement transmission circuit in the event of a transmission line trip (by releasing energy to replace the transmitted energy that was cut-off by the line trip). The Commission recently clarified in response to a request by Western Grid that batteries used in this fashion are eligible for potential cost recovery through the California ISO transmission access charge, provided certain additional protections were in place as described in that order.⁴ Accordingly, cost recovery through a jurisdictional transmission rate would be permissible under certain circumstances.

However, an identical storage facility could be installed on the distribution grid to similarly provide voltage support or serve as a virtual replacement distribution circuit. In that case, the storage asset could be considered to provide non-jurisdictional distribution service, leading to cost recovery through retail rates.

2. Enhancing the Value of Generation

Another possible use of a storage facility is to shift generation output from one period to another. Again, the appropriate rate treatment for a given storage facility will vary with its use. On the one hand, a generation owner could build a storage facility to enhance the market value of its generation by shifting off-peak generation to more lucrative peak periods. If the purpose is to enhance the market value of generation in this way, staff believes that storage facility costs should be recovered through the generator's wholesale energy charges alone (i.e., no separate storage charge).

On the other hand, a load-serving entity could install the same type of storage facility to shift generation output used to serve retail customers; for example to store excess off-peak wind generation for use in serving retail load later in the day. In that case, staff would view this as using storage to serve a non-jurisdictional retail purpose so that no Commission-jurisdictional cost recovery would be permissible. Instead, the load-serving entity would likely seek to include the cost of this storage facility in its bundled retail rates.

However, a load-serving entity may also use such storage facility to reduce demand as part of a wholesale market demand response program. In that case, the storage resource could seek to be compensated as a demand response resource.

⁴ *Western Grid Development, LLC*, 130 FERC ¶ 61,056, at P 43 (2010) (*Western Grid*).

3. Provision of Ancillary Services

Storage facilities also can be used to provide ancillary services, priced at cost or market consistent with the Commission's current rules and regulations. A storage provider wishing to provide these services would appear to enjoy all of the same options for doing so as are currently available to any other independent power marketer.

II. Using Storage Facilities for Multiple Purposes

Distinguishing between the potential uses of electric storage facilities is helpful to identify the potential ratemaking treatment that could apply in varying circumstances. In reality, however, a single storage facility can often be used for multiple purposes, which complicates cost recovery issues.

For example, a transmission provider might be interested in building pumped storage to address issues related to variable energy resource integration. Being a transmission provider, it could use the storage facility as a transmission asset to provide voltage support or as a virtual replacement transmission circuit. On that basis, the transmission provider may seek to recover the asset's costs through Commission-jurisdictional transmission rates. The transmission provider also may be able to use the storage facility to firm up output from variable energy resources used to serve retail load. This latter function would be equivalent to shifting variable generation from one period to another in order to maintain deliverability to retail customers, implicating cost recovery under retail rates. Moreover, the same storage facility could be used to provide ancillary services, the costs of which would be recovered through the transmission provider's Commission-approved rates.

Given that storage facilities can be physically capable of providing multiple services, it may be reasonable to contemplate some appropriate sharing of the total cost of the facilities between Commission-jurisdictional and/or retail rates. It should be noted that permitting storage performing transmission functions to recover costs through transmission rates raises certain additional issues in the Commission context. Some of these issues have been discussed in prior Commission orders.⁵ Staff seeks comment on the following criteria that could be used to determine the mechanisms by which a storage facility can recover its costs, including when the facility is being used for multiple purposes:

1) Intended use and capability of the facility

Recovery in transmission rates could be conditioned on a demonstration that the

⁵ See *Western Grid; Nevada Hydro Co.*, 122 FERC ¶ 61,272 (2008) (*Nevada Hydro*).

intended use of the storage asset is for transmission purposes, such as to support the transmission system through either voltage support or providing energy to address transmission line instability or trips, and that the asset is capable of performing the specified function. Commission staff seeks comment on an “intended use and capabilities” standard, and whether it creates uncertainty. Would a good option be to rely on transmission planning processes to make such a determination? Also, the concept of a storage asset supporting service to transmission customers by providing energy to address transmission line instability or trips seems to rely on the idea that maintaining service to transmission customer “load” is different from maintaining service to non-jurisdictional retail load. Is there enough difference between un-bundled transmission “load” and retail load to justify identifying this as a separate, jurisdictional use of storage rather than a non-jurisdictional retail use?

2) Commitment to address cross-subsidization and competitive concerns

Unlike traditional transmission assets, electric storage serving a transmission function and receiving cost-based transmission rates would also be physically capable of providing ancillary services or otherwise enhancing the value of generation in wholesale energy markets. Accordingly, potential cross-subsidization, competition, and discrimination issues could arise if the storage participated in those markets at the same time it is receiving full cost-recovery through transmission rates. Although a commitment not to participate in wholesale energy markets would address these concerns, staff seeks comment on whether there are other ways to address these concerns such that the storage provider can fully utilize the capabilities of its storage device?

There is some precedent in retail ratemaking for permitting guaranteed cost recovery (in bundled retail rates) while also permitting profit-seeking off-system sales in a competitive environment. Retail regulators at times have addressed this issue by requiring a utility making off-system sales from generation built at retail ratepayer expense to credit to retail rates at least the cost of such off-system sales, and possibly some share of the profit as well. The Commission imposed a similar requirement in *Pacific Gas & Electric Co.*, where it approved a revenue sharing ratemaking treatment for secondary uses of jurisdictional assets, such as leases for space on transmission facilities for telecommunications and the use of transmission tower licenses for wireless antennas.⁶ While those measures could address cross-subsidization issues, staff seeks comment on whether this type of structure would fully address wholesale discrimination and competitive concerns in the electric storage context.

⁶ See *Pacific Gas & Electric Co.*, 106 FERC ¶ 61,058 (2004); *Pacific Gas & Electric Co.*, 90 FERC ¶ 61,314 (2000).

3) Maintaining the independence of market operators

The Commission has long held that a Regional Transmission Organization (RTO) or Independent System Operator (ISO) must be independent of its market participants. ISO/RTO operation of traditional transmission assets does not jeopardize the ISO/RTO's independence from energy market participants because such assets generally cannot participate in the energy market. As noted above however, a storage asset would remain physically capable of participating in the energy market. Moreover, it might need to transact in the energy market in order to charge and discharge for purposes of serving its transmission function. Can an ISO/RTO's "operation" of a storage facility be deemed to include responsibility for charging and discharging the storage facility through energy market transactions without jeopardizing its independence, or is this only a concern if the ISO/RTO is essentially left taking title to the resulting stored power, which was one of the main concerns with the proposal in *Nevada Hydro*?⁷ Do any existing ISO/RTO practices for implementing special dispatch procedures for certain resources (e.g., PJM Interconnection's pool-scheduling procedures for hydro units) convey some level of control or do they simply implement the resource owner's instructions for dispatch in a manner that, while more detailed, is essentially similar to how traditional generators are dispatched based on bid and operating parameters? Could similar special procedures be developed for storage technologies more generally?

4) Application of the *Avista* Policy

The Commission has adopted a policy permitting third-party provision of ancillary services at market-based rates with one key exception, described in the *Avista* orders.⁸ Specifically, third-party provision of ancillary services at market-based rates is prohibited to a transmission provider seeking to meet its own ancillary service requirements. This exception was meant to ensure a competitive market for such ancillary services by maintaining the existence of a cost-based utility back-stop for such services. Subsequently, however, utility industry restructuring sometimes led to situations where the incumbent utility divested its generation assets and thus needed to purchase ancillary services from third-parties. As a result, the Commission began authorizing case-by-case waivers of this prohibition, but otherwise left it in place.

⁷ *Nevada Hydro*, 122 FERC ¶ 61,272 at P 82.

⁸ *Avista Corporation*, 87 FERC ¶ 61,223, *order on reh'g*, 89 FERC ¶ 61,136 (1999).

This prohibition on third-party provision of ancillary services at market-based rates to transmission providers seeking to meet their own ancillary services requirements may pose an undue barrier to the development of storage facilities and other resources capable of providing ancillary services. Staff seeks comment on whether this prohibition with case-by-case waiver remains appropriate and, if not, ideas for revising the policy.

III. New Contract Storage Service

Most interstate natural gas storage facilities are operated as transmission facilities and offer open access storage services to customers who contract for that service; the storage facility operator may not buy and sell the gas commodity at that location. Contract storage service is offered at either cost-based or negotiated rates for the service of storing customers' gas and only those storage customers buy and sell the gas commodity itself (storage customers hold "title" to the gas held in storage). Generally, the customer pays a reservation fee and a storage fee based on usage with penalties for over and under scheduling, though this may not always be the case with negotiated rates. Either way, the time arbitrage gains on the stored gas are the profit or loss for the customer, not the gas storage operator.

This model has not yet been adopted for electric storage facilities but may provide an attractive alternative business model for some storage operators. In this model, the storage operator would operate and maintain the electricity storage facility at its customers' direction and never take title to the energy stored at the facility. Thus, each storage customer would decide how to use its purchased storage capacity. If, for example, a given storage customer has market-based rate authority, then it could use its contracted-for storage capacity to arbitrage differences in peak and off-peak energy prices. The Commission would review the storage provider's cost-based rates for the stand-alone service of storage, or its authority to negotiate market-based rates for that service, separately from the review of the storage customer's independent authority to make power sales using the stored energy (or any other kind of energy).

Alternatively, if the storage facility happens to be favorably located to address a transmission reliability issue, by providing voltage support or serving as a virtual replacement transmission circuit, then to address the issue the local transmission owner could contract with the storage facility to provide this function with all or part of its storage capacity. Again, since the storage provider would provide storage service only at the customer's direction and under a dedicated storage rate, the particular use to which each customer puts its contracted-for storage capacity should not play a role in the Commission's review of the stand-alone storage rate. However the storage customer, in this example a transmission owner, would still need to make its own separate filing to justify transmission rate recovery for the cost of its storage contract.

The primary potential barrier to this type of business model appears to be

financial. An independent contract storage provider might need to sign up long-term customers in advance under bilateral contracts, perhaps following an open season, in order to secure financing for construction of the facility. Storage facilities with large up-front capital costs, like pumped storage, may have difficulty attracting sufficient customer interest during the crucial pre-construction financing phase. However, storage service from newer storage technologies with lower up-front capital costs may be easier to finance and market in this way.

We seek comment on the practicality and usefulness of this type of stand-alone contract storage service.

IV. Accounting and Financial Reporting for New Storage Technologies

The Commission's existing accounting and reporting requirements classify utility plant costs under the following accounts: (1) intangible, (2) steam, (3) nuclear, (4) hydraulic, (5) other production, (6) transmission, (7) distribution, (8) regional transmission and market operation, and (9) general plant. These functional classifications have associated operation and maintenance expense accounts to record expenses associated with the plant assets. However, there are no specific plant asset accounts or related operation and maintenance expense accounts to record costs associated with new storage technologies such as flywheels and chemical batteries. Consequently, Staff seeks comments on the following matters:

1. What new plant functions, if any, should be created to accommodate the above-mentioned technologies?
2. What new plant or new equipment accounts and related reporting requirements, if any, need to be created to facilitate cost of service or other rate policies for the above-mentioned technologies?
3. What new operations and maintenance expense accounts and related reporting requirements, if any, need to be created to facilitate cost of service or other rate policies for the above-mentioned technologies?
4. What new revenue accounts and related reporting requirements, if any, need to be created to facilitate cost of service or other rate policies for the above-mentioned technologies?
5. What type of financial and non-financial data, if any, and what level of detail need to be reported in the FERC Form No. 1 for the above-mentioned technologies and how would the Commission and others use this information for developing and monitoring cost-based rates?

Document Content(s)

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