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How FERC's New Rule Paves The Way For Energy Storage

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Last week, the Federal Energy Regulatory Commission issued its long-awaited final rule that aims to remove barriers to electric storage resource participation and enhance competition in regional transmission organization and independent system operator markets.

On February 15, FERC issued Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators (Order No. 841), a final rule amending FERC's regulations to facilitate participation of electric storage resources in the capacity, energy and ancillary service markets operated by regional transmission organizations (RTOs) and independent system operators (ISOs).

Although certain storage resources such as pumped hydro have been participating in RTO/ISO markets for years, the commission observed that existing market rules designed for traditional resources do not recognize electric storage resources' unique physical and operational characteristics, which can create barriers to entry for emerging technologies. The final rule aims to address those barriers by establishing the minimum requirements by which RTOs and ISOs will facilitate electric storage resource participation in wholesale markets.

The final rule follows a lengthy stakeholder process that attracted significant industry attention since FERC's issuance of a notice of proposed rulemaking in November 2016. The commission largely adopted the proposals set forth in the NOPR, including the requirement for RTOs/ISOs to revise their tariffs to establish a participation model for electric storage resources.

However, the commission opted not to address market participation by aggregated distributed energy resources, as it originally proposed to do. The commission concluded that more information is needed on aggregated distributed energy resources, and will convene a two-day technical conference in April 2018 to gather additional information on those types of resources.

We describe key components of Order No. 841 below.

Applicable Resources

The final rule applies to electric storage resources, which the commission defines as any "resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid." This definition applies to all storage resources, irrespective of their storage medium (e.g., batteries, flywheels, compressed air and pumped hydro) and location on the grid (i.e., the definition applies to resources on the interstate transmission system, on a distribution system or behind the meter). This expansive, resource-neutral definition underscores the commission's view that market rules should not be designed for any particular electric storage technology.

The final rule concludes that an electric storage resource engages in a sale of electric energy at wholesale in interstate commerce if it injects electric energy back to the grid for purposes of participating in an RTO/ISO market. In reaching this conclusion, the commission referenced prior decisions concluding that energy delivered to a storage resource is not "consumed" (i.e., there is no "sale for end use") and the energy remains subject to the commission's jurisdiction. Notably, the commission also references its net-metering precedent and cautions that injections of electric energy back to the grid "do not necessarily" trigger the commission's jurisdiction.

While the commission envisions both front-of-meter and behind-the-meter energy storage resources participating in RTO/ISO markets, the final rule limits such participation to electric storage resources that are at least 100 kilowatts. The commission explains that this size limitation is intended to balance the benefits of increased competition in RTO/ISO markets with the potential burden required to update RTO/ISO market clearing software to effectively model and dispatch smaller resources.

RTO/ISO Participation Models for Electric Storage Resources

The commission adopted its NOPR proposal to require each RTO/ISO to revise its tariff to include a model to facilitate the participation of electric storage resources. Instead of requiring a specific model design, the final rule strikes a balance by permitting RTOs/ISOs the flexibility to tailor market rules that best suit their individual market designs, so long as those rules recognize the physical and operational characteristics of electric storage resources.

Under the final rule, RTOs/ISOs may preserve existing participation models available to electric storage resources (e.g., participation models for pumped-hydro resources or demand response). However, to the extent that an RTO/ISO modifies an existing storage participation model to comply with Order No. 841, it must ensure that those resulting participation models are available for all types of electric storage resources.

Participation Model Eligibility for Electric Storage Resources

To comply with the commission's directives, RTOs and ISOs will be required to define the qualification criteria applicable to potential electric storage resources that intend to use their electric storage resource participation models. Consistent with the NOPR proposal, the final rule requires that the qualification criteria be based on the physical and operational characteristics of electric storage resources, and not limit participation to any particular type of electric storage resource.

The qualification criteria also must ensure that the RTO/ISO is able to dispatch a resource in a way that recognizes its physical and operational characteristics. The commission explains that these minimum

standards for qualification criteria would ensure that new technologies will be able to participate in RTO/ISO markets without the need for specific tariff revisions.

To ensure that electric storage resources have the opportunity to offer the full spectrum of their capabilities, the final rule requires RTOs/ISOs to implement market rules that permit those resources to provide all capacity, energy and ancillary services that they are technically capable of providing, in accordance with the RTO's/ISO's technical requirements and testing procedures.

Electric Storage Resources as Wholesale Sellers and Buyers

In the NOPR, the commission proposed to require RTOs/ISOs to ensure that their tariffs permit electric storage resources to be dispatched and to set the wholesale market clearing price as both a wholesale seller and wholesale buyer, consistent with existing market rules that govern when a resource can set the wholesale price. The final rule adopts this proposal and requires that:

- Resources using the electric storage resource participation model be able to set the price in the capacity markets, where applicable;
- RTOs/ISOs must accept wholesale bids from resources using the electric storage resource participation model to buy energy; and
- Resources using the electric storage resource participation model must be allowed to participate in the RTO/ISO markets as price takers, consistent with the existing rules for self-scheduled resources.

The commission found that requiring RTO/ISO markets to value electric storage resources as both supply and demand improves the market participation opportunities for those resources. Moreover, the commission believes that the new reforms will improve market efficiency by enabling RTOs/ISOs to dispatch electric storage resources in accordance with the highest value service that they are capable of providing at that time, thereby better reflecting the value of storage as a marginal resource.

To the extent that an electric storage resource participates as both supply and demand, the final rule requires that the sale of electric energy from the RTO/ISO markets to an electric storage resource that the resource then resells back to those markets (i.e., charging energy) be at the wholesale locational marginal price.

Physical and Operational Characteristics of Electric Storage Resources

In the NOPR, the commission proposed to require RTO/ISO electric storage resource participation models to incorporate bidding parameters that reflect and account for the physical and operational characteristics of qualifying electric storage resources. The commission viewed the absence of such information as a potential barrier to electric storage resource participation in RTO/ISO markets. The final rule largely adopts the NOPR proposal, but affords RTOs/ISOs greater flexibility by allowing them to account for electric storage resource characteristics using other means than solely through bidding parameters. At a minimum, RTOs/ISOs must account for the following physical and operational characteristics:

- State of charge
- Minimum and maximum state of charge
- Minimum and maximum charge limit

- Minimum and maximum charge time
- Minimum and maximum run time
- Minimum and maximum discharge limit
- Discharge ramp rate
- Charge ramp rate

The commission will permit an RTO/ISO to propose additional physical and operational characteristics of electric storage resources that the RTO/ISO may wish to reflect in its participation model.

Effective Date

The final rule will take effect 90 days after publication in the Federal Register. RTOs and ISOs will have 270 days after the publication date to submit compliance filings, with an additional 365 days from that date to fully implement the new tariff provisions.

Conclusion

The reforms addressed in Order No. 841 represent a major step toward incorporating newer storage resources into RTO and ISO markets. The final rule should enhance competition in wholesale energy markets and result in more efficient market results with the incorporation of electric storage resources serving as both wholesale demand and supply resources.

The commission's action also paves the way for electric storage resource development. The reforms should incentivize developers to design and invest in new technologies, and will present an enhanced opportunity for utilities to deploy more utility-scale storage resources that can be located on either the distribution or transmission system.

We note that although Order No. 841 is itself technology-neutral, the tariff provisions implemented by any given RTO/ISO will determine how energy storage resources are compensated, and may favor certain technologies over others. Market participants in any given RTO/ISO with an interest in energy storage are advised to focus closely on the tariff provisions being developed by each RTO/ISO.

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