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Renewable Energy Storage Projects: Financing Options, Deal Structures, Tax Issues, and Regulatory Challenges

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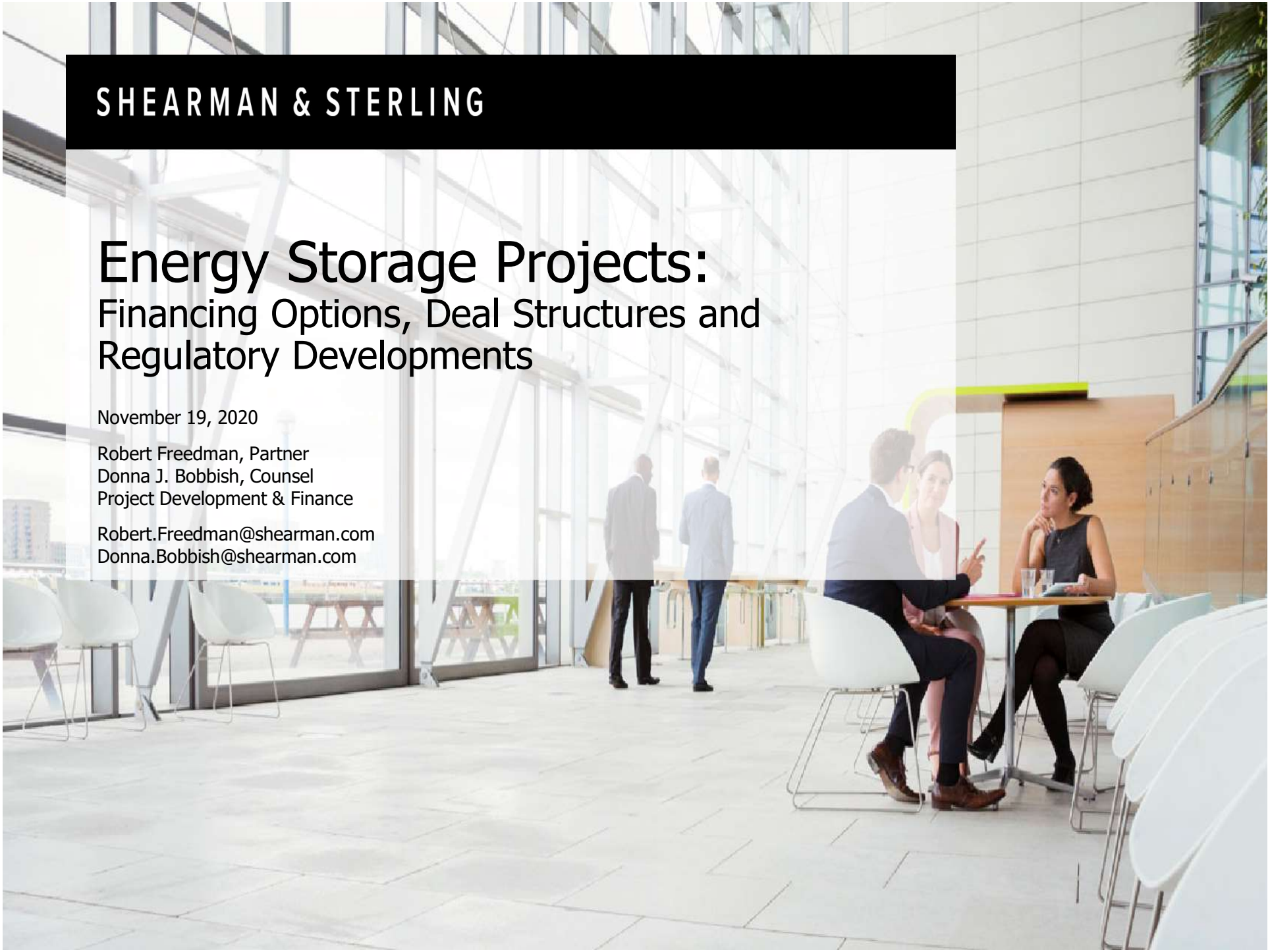

SHEARMAN & STERLING

Energy Storage Projects:
Financing Options, Deal Structures and Regulatory Developments

November 19, 2020

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Brief primer on energy storage projects: technologies

- **Pumped storage hydropower** projects consist of an upper reservoir and a lower reservoir (man-made or natural lake or river). When electricity demand is low, water is pumped to the upper reservoir and stored. When electricity demand increases, stored water is released from the upper reservoir and passes through the powerhouse, generating power as it is released into the lower reservoir.
- **Hydrogen** energy storage systems use electrolysis to convert electricity into hydrogen, which is stored and later re-electrified.
- **Battery** energy storage systems consist of one or more electrochemical cells that convert stored chemical energy into electrical energy.
- **Thermal** energy storage systems temporarily reserve – in the form of molten salt or other materials – energy produced in the form of heat or cold.
- **Mechanical** energy storage systems exploit kinetic or gravitational forces (e.g., spinning flywheel) to store inputted energy.

Brief primer on energy storage projects: asset classification

- Energy Storage Projects challenge the historical classification of assets in the electricity sector, which might have been expressed by Julius Caesar in his Commentaries as:

  "Electricae est omnis divisa in partes tres: generatio, transmissio et distributio."

  ("Electricity is a whole divided into three parts: generation, transmission and distribution.")

- **Generation:** the process of producing electric power from sources of primary energy.
- **Transmission:** the movement of bulk electricity at high voltage from generation sites over long distances to substations closer to areas of electricity demand.
- **Distribution:** the delivery at lower voltages of electricity to end-users.

Brief primer on energy storage projects: functions/services

- **Generation**
  - Firm/Peaking Capacity
  - Energy
  - Ancillary Services
    - reactive power and voltage control
    - scheduling and dispatch
    - frequency response/regulation
    - operating reserves
- **Transmission**
  - Energy storage projects can inject and withdraw energy from the grid, allowing them to operate as a substitute for transmission facilities.
    - Mitigate transmission overload/congestion
    - Respond to transmission lines taken offline for maintenance
    - React to voltage dips on transmission line segments
  - Energy storage projects can be used to defer new transmission construction and transmission system upgrades.

Brief primer on energy storage projects: locations

- **Bulk Energy Storage**
  - Grid-connected and dispatchable
  - Based on grid requirements
  - Typically larger systems
- **Distributed Energy Storage**
  - Grid-connected or not grid-connected
  - Based on local and on-site requirements
- **Integrated Energy Storage**
  - Batteries at PV solar or wind plants, molten salt storage at solar thermal plants
  - Dispatch may be limited by host site

Federal energy regulatory status of energy storage projects

- The Federal Energy Regulatory Commission (FERC) which, under the Federal Power Act (FPA), has jurisdiction over the interstate transmission and wholesale sale of electric energy, has observed numerous times over the past decade or so that energy storage projects do not readily fit into only one of the traditional asset functions of generation, transmission or distribution.
- This presents interesting issues for FERC with respect to
  - Ability to participate in wholesale electricity markets
  - Rates
  - Eligibility for certain regulatory benefits
  - Federal/state jurisdiction

Energy storage projects as generation: FERC Order No. 841

- In 2018, FERC issued a Final Rule requiring that wholesale electricity capacity, energy and ancillary services markets operated by FERC-jurisdictional regional transmission organizations and independent system operators (RTOs/ISOs) be open to electric storage resources (ESRs).
- In Order No. 841, *Electric Storage Participation in Markets Operated by RTOs and ISOs*, 162 FERC ¶61,137 (2018), FERC found that:
  - Existing RTO/ISO market rules are unjust and unreasonable in light of barriers they present to the participation of ESRs in RTO/ISO markets, thereby reducing competition and failing to ensure just and reasonable rates;
  - RTO/ISO rules that limit the services that ESRs are technically capable of providing may create barriers to the participation of ESRs in RTO/ISO markets; and
  - Where RTOs/ISOs have adopted market rules providing for the participation of ESRs, barriers also exist, because such rules often were designed for ESRs with very specific characteristics (such as pumped-hydro resources or other ESRs with a maximum run-time that is less than one hour), limiting ESRs from providing the full range of services that they are technically capable of providing.
- FERC required NYISO, ISO-NE, PJM, MISO, SPP and CAISO to submit tariff provisions establishing a "participation model" for ESRs.

What is an "ESR"?

- In Order No. 841, FERC defines an ESR as a resource "capable of receiving electric energy from the grid and storing it for later injection of electricity back to the grid."
- FERC's definition covers ESRs "regardless of their storage medium (e.g., batteries, flywheels, compressed air, and pumped-hydro)."
- FERC's definition of ESR includes resources located on the interstate transmission system, on a distribution system, or behind the meter.
- FERC clarified that "technically capable" of providing a service means meeting all of the technical, operational and or performance requirements necessary to reliably provide that service.
- FERC clarified that "capable of . . . later injection of electric energy back to the grid" means that the ESR is both
  - physically designed and configured to inject electric energy back to the grid; and
  - as relevant, is contractually permitted to do so (e.g. per the interconnection agreement between an ESR that is interconnected on a distribution system or behind the meter with the distribution utility to which it is interconnected).

What is not an "ESR"?

- FERC's definition of ESR *excludes* a resource that is either:
  - physically incapable of injecting electric energy back onto the grid due to its design or configuration or
  - contractually barred from injecting electric energy back onto the grid.

Creation of a participation model for ESRs

- In Order No. 841, FERC required each RTO/ISO to establish a participation model consisting of market rules
  - recognizing the physical and operational characteristics of ESRs and
  - facilitating ESR participation in RTO/ISO markets.
- This participation model must
  - ensure that an ESR is eligible to provide all capacity, energy and ancillary services that it is technically capable of providing in RTO/ISO markets;
  - enable an ESR using the participation model to be dispatched.
  - ensure that such a dispatchable ESR can set wholesale market clearing prices as both a wholesale seller and wholesale buyer consistent with existing market rules;
  - account for the physical and operational characteristics of ESRs through bidding parameters or other means; and
  - establish a minimum requirement for participation in RTO/ISO markets that does not exceed 100 kW; and
- In Q3 2019, FERC largely accepted the Order No. 841 compliance filings of PJM, SPP, NYISO, CAISO, MISO and ISO-NE, subject to additional filings.

Rates

- FERC found that the sale of energy from the grid that is used to charge ESRs for later resale in to energy or ancillary services markets constitutes a sale for resale in interstate commerce and, as such, the just and reasonable rate for the wholesale sale is the RTO/ISO market wholesale locational marginal price (LMP).
  - This requirement applies regardless of whether the ESR is using the participation model for ESRs or another participation model to participate in RTO/ISO markets, as long as the resource meets the definition of an ESR.
- FERC observed that an ESR that injects electric energy back to the grid for purposes of participating in an RTO/ISO market engages in a sale of electric energy at wholesale in interstate commerce, and must fulfill certain responsibilities under the FPA and FERC's rules and regulations, including filing rates and applying for market-based rate authority under Section 205 of the FPA.
- ESRs should be assessed transmission charges when they are charging for later resale into the wholesale market, but not when dispatched by the RTO/ISO to provide services such a frequency regulation or downward ramping service.

What FERC Order No. 841 does not do

- Order No. 841 does not require ESRs to participate in RTO/ISO markets.
- Order No. 841 does not require all ESRs to use the participation model for ESRs, and does not preclude ESRs from continuing to participate in demand response programs or under other participation models in any RTO/ISO in which they are eligible to participate
- Order No. 841 does not preclude RTOs/ISOs from structuring their markets based on the technical requirements that an ESR must meet to provide needed services.
- Order No. 841 does not require an RTO/ISO to create and provide a capacity product that an RTO/ISO market does not otherwise offer.
- FERC declined to allow states to decide whether ESRs in their states that are located behind a retail meter or on the distribution system are permitted to participate in the RTO/ISO markets through the ESR participation model.
  - This ruling was upheld by the U.S. Court of Appeals for the D.C. Circuit in *NARUC v. FERC*, No. 19-1142 (July 10, 2020).

Energy storage projects as generation: FERC Order No. 2222

- In 2020, FERC issued a Final Rule requiring that wholesale electricity capacity, energy and ancillary services markets operated by FERC-jurisdictional RTOs and ISOs be open to distributed energy resources (DERs).
- In Order No. 2222, *Participation of Distributed Energy Resource Aggregations in Markets Operated by RTOs and ISOs*, 172 FERC ¶61,247 (2020), FERC found that:
  - Existing RTO/ISO market rules are unjust and unreasonable because they present barriers to the participation of DER aggregations in RTO/ISO markets and such barriers reduce competition and fail to ensure just and reasonable rates.
  - Current RTO/ISO rules present barriers that prevent certain DERs that are technically capable of participating in RTO/ISO markets on their own or through aggregation from doing so.
  - Individual DERs often do not meet the minimum size requirements to participate in RTO/ISO markets under existing participation models and often cannot satisfy all the performance requirements of the various participation models due to their small size.
- FERC also found that current RTO/ISO rules often limit services that DERs are eligible to provide to demand response or load-side resources when they are located behind a customer meter.

What is a "DER" and a DER "aggregator"?

- FERC has described DERs as small-scale power generation or **storage** technologies, typically from 1 kW to 10,000 kW in size, that can provide an alternative to or an enhancement of the traditional electric power system.
- In Order No. 2222, FERC defines a DER as "any resource located on the distribution system, any subsystem thereof, or behind a customer meter."
- FERC also explains that DERs may include, but are not limited to, **ESRs**, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment – as long as such a resource is "located on the distribution system, any subsystem thereof or behind a customer meter."
- FERC requires that each RTO's/ISO's rules not prohibit any particular type of DER technology from participating in DER aggregations.
- In Order No. 2222, FERC defines a DER aggregator as the entity that aggregates one or more DERs for purposes of participation in the capacity, energy and/or ancillary service markets of the RTOs/ISOs.

Creation of a participation model for DERs

- In Order No. 2222, FERC requires each RTO/ISO to file, **by July 19, 2021,** revisions to its Tarff to:
  - allow DER aggregations to participate directly in the organized wholesale electric markets;
  - establish DER aggregators as a type of market participant;
  - allow DER aggregators to register DER aggregations under one or more participation models in the tariff that accommodate the physical and operational characteristics of the DER aggregation; and
  - establish a minimum size requirement for DER aggregations that does not exceed 100 kW;
- FERC also requires RTOs/ISOs to address:
  - locational requirements for DER aggregations;
  - distribution factors and bidding parameters for DER aggregations;
  - information and data requirements for DER aggregations;
  - metering and telemetry requirements for DER aggregations;
  - coordination between the RTO/ISO, the DER aggregator, the distribution utility, and regulatory authorities;
  - modifications to the list of resources in a DER aggregation; and
  - market participation agreements for DER aggregators.

FERC jurisdiction

- In Order No. 2222, FERC found that sales of electric energy by DER aggregators for purposes of participating in and RTO/ISO markets are wholesale sales subject to FERC jurisdiction.
- To the extent a DER aggregator makes sale of electric energy into RTO/ISO markets, it will be considered a public utility subject to FERC jurisdiction and most fulfill certain responsibilities under the FPA, including among other rate filings under Section 205 of the FPA and potentially including market-based rate authority.
- If DER aggregator (1) aggregates only demand resources or (2) aggregates only customers in a net metering program that are not net seller, that DER aggregator would not become a public utility.
- FERC clarified that it is only exercising jurisdiction over sales by DER aggregators into RTO/ISO markets, and that an individual DER's participation in a DER aggregation would not cause that individual resource to become subject to requirements applicable to FERC-jurisdictional public utilities.

Opt-out/opt-in mechanisms

- In Order No. 2222, FERC declined to include a mechanism for all relevant electric retail regulatory authorities to prohibit all DERs from participating in the RTO/ISO markets through DER aggregations ("Opt-Out").
- However, to address concerns about significant indirect costs borne by smaller entities to facilitate DER participation in wholesale markets, Order No. 2222 establishes an "Opt-In" mechanism for small utilities. Specifically, FERC requires RTOs/ISOs to:
  - accept bids from a DER aggregator if its aggregation includes DERs that are customers of utilities that distributed more than 4 million megawatt-hours in the previous fiscal year; and
  - not accept bids from a DER aggregator if its aggregation includes DERs that are customers of utilities that distributed 4 million megawatt-hours or less in the previous fiscal year, unless the relevant electric retail regulatory authority permits such customers to be bid into RTO/ISO markets by a DER resource aggregator.

Avoiding double counting/double compensation

- In Order No. 2222, instead of barring participation in both wholesale and retail or multiple wholesale programs, FERC requires each RTO/ISO to revise its tariff to
  - Allow DERs that participate in one or more retail programs to participate in wholesale markets
  - Allow DERs to provide multiple wholesale services; and
  - Include appropriate restrictions on DERs participating in RTO/ISO markets through DER aggregators, if narrowly designed to avoid counting and compensating more than once the service provided by DERs in RTO/ISO markets.
- FERC found it appropriate for RTOs/ISOs to place restrictions on the RTO/ISO market participation of DERs through aggregations after determining whether a DER that is proposing to participate in a DER aggregation is
  - registered to provide the same services either individually or as part of another RTO/ISO market participant; or
  - included in a retail program to reduce a utility's or other load serving entity's obligations to purchase services from the RTO/ISO market.

Energy storage projects as transmission: Nevada Hydro

- In *Nevada Hydro Co., Inc.* 122 FERC ¶61,272 (2008), FERC denied a request that the Lake Elsinore Advanced Pumped Storage (LEAPS) project be treated as a transmission facility under the operational control of CAISO and that the cost of LEAPS be included in CAISO's rolled-in, cost-based transmission access charge (TAC).
- FERC found that LEAPS is an "advanced transmission technology" that FERC should encourage, as appropriate, under Section 1223 of EPAct 2005.
- However, FERC concluded that it would not be appropriate for CAISO to assume operational control over the pumped storage facility, because it would compromise CAISO's independence.
- FERC also found that the purpose of CAISO's TAC is to recover the costs of transmission facilities under CAISO control, not to recover the costs of bundled services.
- FERC concluded that, absent information to justify treating LEAPS differently from the existing pumped hydro facilities in CAISO, allowing LEAPS to receive a guaranteed revenue stream through CAISO's TAC would create an undue preference for LEAPS compared to other similarly situated pumped hydro generators.

Energy storage projects as transmission: Western Grid

- In *Western Grid Dev., LLC,* 130 FERC ¶61,056 (2010), FERC granted a petition for declaratory order requesting that FERC classify ESRs consisting of sodium sulfur batteries ranging from 10 to 50 MW to be constructed and operated at specific sites along the CAISO grid as transmission for cost-based recovery purposes.
- FERC noted that the electricity storage devices to be used Western Grid's projects do not readily fit into only one of the traditional asset functions of generation, transmission or distribution.
- FERC found that
  - When operated at CAISO's direction to provide voltage support and thermal overload protection for relevant transmission facilities, the ESRs would function as wholesale transmission facilities;
  - CAISO independence would be maintained because CAISO would not be responsible for buying power to energize the resources or physically operating the batteries when they were being charged and discharged;
  - Western Grid would not retain any revenues outside of the transmission access charge and would credit any incidental revenues it may accrue as a result of charging or discharging the ESRs to transmission customers; and
  - The ESRs would not undercut competitive bids by other market participants because Western Grid would not be offering the ESRs into CAISO markets, but rather would only use the resources to provide voltage support and to address thermal overload situations at CAISO's instruction.

Energy storage projects as transmission: MISO

- In August 2020, in *Midcontinent Independent System Operator, Inc.*, 172 FERC ¶ 61,132 (2020), FERC approved MISO's proposed tariff rules that allow, under certain circumstances, ESRs to qualify as a "storage facility as a transmission-only asset" (SATOA) eligible for full cost-of-service transmission rates.
- FERC found that under MISO's proposal as approved,
  - A storage facility will not qualify as a SATOA unless it is needed to recover a discrete, non-routine transmission need that only can be addressed by an asset under MISO's functional control, and not by a resource operating in MISO's markets.
  - SATOAs must meet the same qualification requirements as required for traditional transmission solutions for all existing FERC-approved project types.
  - MISO's independence would be preserved, even though MISO must assert functional control over the resource, because the SATOA owner is responsible for managing the SATOA's state of charge to ensure readiness to address the transmission need.
  - A SATOA's operation would be limited to serving a transmission function and, thus, should recover costs in the same manner as transmission facilities.

Energy storage projects as transmission: MISO (cont.)

- A SATOA may only participate in MISO markets to the extent necessary to receive energy from the transmission system and inject energy into the transmission system to provide these services for which it was included in the MISO Transmission Expansion Plan (MTEP).
- A SATOA may not otherwise participate in MISO's capacity, energy or ancillary services markets.
- A SATOA will receive revenues or incur costs when charging or discharging but will not be eligible to serve as a market resource.
  - A SATOA will need a registered market participant party to receive net energy costs.
  - The SATOA market participant must provide net revenues back to the transmission owner and the net revenues will offset the transmission revenue requirement associated with the resource.
  - Unlike ESRs under Order No. 841, a SATOA will be a price taker.

Energy storage projects as both generation and transmission

- In 2017, FERC issued a Policy Statement, *Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery*, 158 FERC ¶61,051 (2017), providing guidance on
  - the ability of ESRs to receive cost-based rate recovery for certain services, such as transmission or grid support services, while also receiving market-based revenues for providing separate market-based rate services, and
  - issues that should be addressed by ESRs when seeking to recover concurrently their costs through both cost-based and market-based rates.
- In the Policy Statement, FERC observed that ESRs
  - can both charge and discharge electricity,
  - can provide multiple services;
  - can switch from providing one service to another almost instantaneously, and
  - may fit into one or more of the traditional asset functions of generation, transmission and distribution.

FERC policy statement guidance

- FERC observed that an ESR receiving cost-based rate recovery for providing one service also may be technically capable of providing other market-based rate services.
- If an ESR seeks to recover its costs through both cost-based and market-based rates concurrently, the following issues should be addressed:
  - Potential for double recovery of costs by the ESR owner or operator to the detriment of cost-based ratepayers
  - Potential for cost recovery through cost-based rates to inappropriately suppress competitive prices in wholesale electric markets to the detriment of other competitors who do not receive such cost-based rate recovery, and
  - The level of control in the operation of an ESR by an RTO/ISO that could jeopardize its independence from market participants.
- FERC clarified that providing services at both cost-based and market-based rates is permissible as a matter of policy.
- FERC clarified that there may be approaches other than the one presented in *Western Grid* under which an ESR may receive cost-based rate recovery and, if technically capable, provide market-based services.

Avoiding double recovery of costs

- In the Policy Statement, FERC clarified that in, addition to the approach in *Western Grid*, (foregoing sales into wholesale markets) crediting any market revenues back to the cost-based ratepayers is one possible way to address potential double recovery of costs.
- The amount of crediting may vary depending on how the cost-based rate recovery is structured.
- For example, if the ESR indicates that it will seek to recover its full, unadjusted costs through cost-based rates, it may be reasonable for the ESR owner or operator to credit all projected market revenues earned by the ESR over a reasonable period of time (expected useful life of the asset or the term of the cost-based rate services).
- Alternatively, the market-revenue off-set can be used to reduce the amount of the revenue requirement to be used in the development of the cost-based rate.

Minimizing adverse impacts on wholesale electric markets

- FERC stated that it was not convinced by commenters' arguments that allowing ESRs to receive cost- and market-based revenues concurrently for providing separate services will undermine competition or suppress market prices to sub-competitive levels
- FERC stated that denying ESRs the possibility of earning cost-based and market-based revenues on the theory that having dual revenue streams undermines competition, would require revisiting years of precedent allowing cost-based and market-based sales to occur concurrently, such as:
  - Cost-based rates for reactive power and market-based rate wholesale sales
  - Cost-based sales to captive wholesale requirements customers and off-system market-based rate sales
- FERC also said that any concerns that ESRs would offer in a manner that suppresses market clearing prices simply because they receive cost recovery (in whole or in part) through cost-based rates could be addressed by the manner in which (1) double recovery is addressed and (2) the costs that go into cost-based rates are established.

RTO/ISO independence

- FERC clarified its conclusion in *Nevada Hydro* that it would be inappropriate to require CAISO to assume "any level of operation control" over the LEAPS facility, stating that there is nothing unreasonable about an RTO/ISO exercising some level of control over the resources it commits or dispatches where it can be shown that the RTO/ISO independence is not an issue.
- FERC stated that to ensure RTO/ISO independence, the provision of market-based rate service should be under the control of the ESR owner or operator, rather than the RTO/ISO.
- FERC stated that, when the circumstances leading to the need for the service compensated though cost-based rates arise, RTO/ISO dispatch of the ESR to address that need should receive priority over the ESR's provision of market-based rate services. Performance penalties could be imposed on the ESR owner or operator for failure to perform at such times.

Nevada Hydro post-2017 Policy Statement petition

- In 2018, Nevada Hydro filed a Petition for Declaratory Order asking FERC to find that LEAPS is a wholesale transmission facility as established in the Policy Statement and will be entitled to cost-based rate recovery under CAISO's TAC if it is selected in the transmission planning process (TPP).
- In *Nevada Hydro Company, Inc.*, 164 FERC ¶ 61,197 (2018), FERC dismissed Nevada Hydro's petition, finding that
  - LEAPS has not been studied in CAISO's TPP to determine whether it addresses an identified transmission need identified and, if such a need were met, how the facility would be operated.
  - Without such information, FERC cannot make a reasoned decision on whether LEAPS is a transmission project and thus eligible for cost-recovery under the TAC.
  - The 2017 Policy Statement does not provide guidance for determining whether a particular ESR is a transmission facility eligible for cost recovery through transmission rates.
  - Because an ESR may not readily fit into only one of the traditional asset functions of generation, transmission or distribution, FERC addresses the classification of ESRs on a case-by-case basis.
  - An ESR that seeks a finding from FERC that it is a transmission facility eligible to recover its costs through transmission rates must demonstrate why it should be considered a transmission facility.

Energy storage projects as QFs under PURPA

- Qualifying Facilities (QFs) under the Public Utility Regulatory Policies Act of 1978 (PURPA) receive certain benefits, including the requirement that electric utilities purchase the output of QFs (mandatory purchase obligation) at "avoided cost rates."
- Certain types and sizes (MW) of QFs also are eligible for exemptions from regulation under some provisions of the FPA, the Public Utility Holding Company Act of 2005 ("PUHCA") and state laws and regulations respecting the rates and financial and organizational regulation of electric utilities
- Under FERC's regulations, small power production QFs must meet size (not more than 80 MW) and fuel use (renewable resources) requirements, and be certified as a QF.
- In *Luz Development and Finance Corp.*, 51 FERC ¶61,078 (1990), FERC
  - found that the primary energy source of a battery system is the electricity energy utilized to initiate the electro-chemical reaction and
  - held that energy storage facilities, including battery systems, are a renewable resource for purposes of QF certification, provided that the energy input into the facility is itself biomass, waste, a renewable resource, a geothermal resource, or any combination thereof.

Energy storage projects as QFs under PURPA: QF Status

- In 2018, Beaver Creek Wind II, LLC sought a FERC order recertifying its 78 MW wind facility as small power production QF to include a 40 MW/h battery storage system with a SCADA system that would limit the facility's output to 80 MW at any given time.
- NorthWestern Corporation filed with FERC a petition seeking revocation of the QF status of the Beaver Creek II facility, as well as three other facilities with similar battery storage systems, Beaver Creek Wind I, Beaver Creek Wind III, and Beaver Creek Wind IV, arguing that the addition of battery storage systems causes the four facilities to violate the 80 MW limit for small power production QFs.
- In 2019, Beaver Creek II withdrew its application for recertification of its facility as a small power production QF, stating that the lack of regulatory certainty has affected Beaver Creek II's ability to complete the project as proposed, and that it plans to reconfigure the project. *See* Beaver Creek Wind II, LLC, Docket No. QF17-673-000.
- Beaver Creek I, Beaver Creek II, Beaver Creek III and Beaver Creek IV relinquished the QF status for their facilities because regulatory uncertainty negatively affected the ability to develop the projects as proposed. *See NorthWestern Corporation*, Order Granting Motion to Dismiss Petition for Declaratory Order as Moot, 168 FERC ¶61,049 (2019).

Energy storage projects as QFs under PURPA: QF Status (Cont.)

- In September 2020, in *Broadview Solar, LLC*, 172 FERC ¶61,194 (2020), FERC denied recertification of a combined 160 MW solar photovoltaic and 50 MW battery storage facility because the facility exceeds the 80 MW "power production capacity" limit for small power production QFs under PURPA.
- In 2019, Broadview Solar, LLC self-recertified its facility as a small power production QF with a gross capacity of 160 MW (DC) and net capacity of 80 MW.
- FERC found that the facility's inverters are capable of converting only 80 MW into AC power, but that is a conversion limit, not a limit on the facility's power production capacity.
- FERC reconsidered a 40 year-old precedent indicating that the power production capacity of a small power production facility is the maximum net output of the facility which is "sent out."
- FERC made its ruling prospective and said that it does not affect QFs that have self-certified or have been granted certification by FERC prior to the date of the *Broadview* order.
- FERC specifically left open the issues of whether the associated battery storage system is a separate facility and whether and how the battery storage system should be considered in determining the facility's power production capacity.

Energy storage projects as QFs under PURPA: state PURPA contracts

- In 2017, Franklin Energy Storage (Franklin) pursued 20-year avoided cost rate contracts with Idaho Power Company for four 25 MW battery ESRs under terms and rates establish by the Idaho Public Utilities Commission (IPUC) for non-wind and non-solar QFs.
- Franklin self-certified the four 25 MW battery ESRs as small power production QFs with FERC under PURPA, Identifying the primary energy input as "other renewable resource," and explaining that "[t]he energy storage (battery) system will take its input from 100% renewable energy sources such as wind, solar, biogas, biomass, etc."
- The IPUC found that the primary energy source for the four ESRs is solar generation, and under the IPUC's regulations, solar resources larger than 100 kW are entitled to negotiate two-year PURPA contracts through Idaho's Integrated Resource Planning (IRP) methodology.
- In 2018, FERC declined Franklin's request to initiate an enforcement action under PURPA against the IPUC for classifying the four battery storage facilities as solar QFs.
- In 2020, in *Franklin Energy Storage One, LLC, v. Kjellander*, the U.S. District Court District of Idaho ruled that the IPUC exceeded its jurisdiction under PURPA in classifying the ESRs as solar QFs.

State energy storage programs

- As of 2020, the following states have established energy storage mandates/targets.
  - California (2013) 1,325 MW by 2020
  - Oregon (2015) 10 MWh by 2020
  - Massachusetts (2017) 1000 MWh by 2025
  - New York (2017) 3,000 MW by 2030
  - New Jersey (2017) 2,000 MW by 2030
  - Nevada (2020) 1,000 MW by 2030
  - Virginia (2020) 2,700 MW by 2035
- At least 10 states have established financial incentives for energy storage projects, including rebates, tax credits, and property tax incentives
  - Arizona
  - California
  - Florida
  - Maryland
  - Massachusetts
  - Nevada
  - New Hampshire
  - New Jersey
  - New York
  - Oregon

Types of Deals/Deal Structures Prominently Seen in Current Market

- Utility Scale
  - Stand-alone utility scale battery storage
  - Hybrid structures (e.g., solar with battery, hydro)
- Distributed Generation/Co-Located/Smaller Scale

Utility Scale Storage Transactions

- Project Finance is Project Finance
  - Utility scale storage transactions follow traditional project finance principles but there can be differences in the details
- Project Agreements
  - EPC
  - Offtake
  - Interconnect
  - O&M
- Market and offtake structures drive deal structure and terms

Project Agreement Considerations in Utility Scale Storage Transactions

- EPC
  - More significant focus on technology and warranty terms
  - Similar analysis on L/D's, completion and milestone analysis
- Offtake
  - RA Contracts, CCA's, Hedging
  - Regulatory approvals
- Interconnect
  - Battery may be co-located and sharing interconnection
  - Shared facilities arrangements
- A word on real estate considerations . . .

Transaction Structures

- Given possible long-term contracts, utility scale battery storage lends itself well to traditional project finance
- However, the "newness" of the product means that the commercial bank market provides a good option for construction financing with longer term financing options (including private placement) suited for post-completion
- Ease of operation and management can provide for more flexible terms than more complicated assets
- Traditional project finance risks are focused on (construction risk, off-take, etc.)
- Structures for hybrid financings depends on which asset is driving revenues (i.e., the generation asset or the battery)
- Stand-alone battery financings are viewed differently from other traditional storage assets likes like hydro

Distributed Generation/Co-Located/Smaller Scale

- This area of storage has been more a focus for mezzanine type investors and other type investors willing to take development risk
- Typical deal structures look like joint venture arrangements or mezzanine-style financings; scale is an issue
- Development and construction arrangements may present unique local permitting issues
- Offtake may focus on understanding state or local incentive structures

Summary

- Utility Scale storage financing structures have borrowed from traditional project finance
  - Markets and offtake structures will drive deal terms and unique features of markets will drive unique features in transactions
- Distributed or Smaller-Scale Battery will likely continue to attract a different group of investors because of the unique issues around development and off-take

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