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FERC NOPR on Integrating Renewable Energy Resources into the Transmission Grid

Presented by:

Floyd L. Norton, IV (202) 739-5620 fnorton@morganlewis.com

Joseph C. Hall (202) 739-5236 jchall@morganlewis.com

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DISCUSSION OVERVIEW

- A combination of energy and environmental public policy initiatives and tax incentives has driven the rapid growth of wind and/or solar generation (or other variable energy resources ("VER")) in the United States in recent years.
- Among other public policy initiatives, a large number of states have implemented renewable portfolio standards ("RPS"), which must be satisfied within the next five to twenty years.
- Many electric utilities plan to satisfy their RPS obligations by either constructing VERs or by purchasing the output of such facilities.

BACKGROUND - WHAT IS A VER?

- For purposes of FERC's NOPR, a VER is "an electric generating facility that is characterized by an energy source that:
  - is renewable;
  - cannot be stored by the facility owner or operator; and
  - has variability that is beyond the control of the facility owner or operator."
- FERC explains that "[t]his includes, . . . wind, solar thermal and photovoltaic, and hydrokinetic generating facilities."
- *See Integration of Variable Energy Resources*, 133 FERC ¶ 61,149 at P 1, fn 2. (2010).

COMPLICATIONS ASSOCIATED WITH INTEGRATION OF VERS INTO BULK POWER SYSTEMS

- Power Production Fluctuations: VER generation output fluctuates with the availability of the relevant “fuel” source
- When power production drops, system “reserves” must be relied upon in order to balance real-time generation and real-time load. The over-reliance on reserves drives up the costs of the reliable operation of bulk power systems.

COMPLICATIONS ASSOCIATED WITH INTEGRATION OF VERS INTO BULK POWER SYSTEMS

- Power Production Forecasting: Because VER output is variable, it is more difficult to forecast power production for VERs than conventional generation resources, thereby making it more difficult to operate and plan bulk power systems in real-time, as well as the near-term and long-term operating and planning horizons.
- Fluctuations in VER generation often cause “mismatches” between scheduled generation and associated scheduled transmission service.

FERC VER NOPR (DOCKET NO. RM10-11)

- On November 18, 2010, in Docket No. RM10-11-000, FERC promulgated the VER NOPR to facilitate the integration of VERs into the bulk power system in light of, among other issues, the above complications.
- The VER NOPR reflects FERC's preliminary response to a January 21, 2010, "Notice of Inquiry" seeking industry feedback on the state of the integration of VERs into the bulk power system.
- Industry comments are due March 2, 2011.

FERC VER NOPR (DOCKET NO. RM10-11)

The NOPR proposes to revise the current *pro forma* OATT and the *pro forma* LGIA in three ways to facilitate the integration of VERs into the bulk power system.

- The first two proposals – a transition to intra-hour transmission service "schedules" under the *pro forma* OATT and a requirement under the *pro forma* LGIA that public utility transmission providers be given data for enhanced power output forecasting – focus on operational limitations associated with VERs.
- The third proposal – a new Generation Regulation and Frequency Response Service to be provided under the *pro forma* OATT - allows public utility transmission providers to recover the costs of providing "generator regulation service." The costs recovered are those associated with holding generation capacity on-line and available to accommodate the moment-to-moment variations of generation output.

FERC VER NOPR - POLICY OBJECTIVES

FERC explained that, among other anticipated benefits, proposals in the VER NOPR are meant:

- to preserve bulk system reliability by limiting VERs' tendency to lean on system reserves in order to balance system generation and load in real-time operations; and
- to ensure that public utility transmission providers are able to recover all costs associated with accommodating fluctuations in generation, especially those associated with VERs.

Historic Generation Dispatch

- When FERC issued Order No. 888, the vast majority of generation resources interconnected to the bulk power system were dispatchable and, therefore, the OATT reflected some fundamental assumptions governing the scheduling of transmission service reservations.
- Order No. 888 reflects FERC's historical expectation that "[a] Generator should be able to deliver its scheduled hourly energy with precision." (*See* Order No. 888-A at 30,230)

Pro Forma OATT Scheduling Provisions

- The current *pro forma* OATT's transmission scheduling provisions (included in Section 13.8 and 14.6 of that tariff) reflect Order No. 888's generation dispatch assumption and provide that transmission scheduling should be conducted on "hour to hour" intervals.
- Changes in schedules currently are permitted up to twenty minutes before the next scheduling interval.

FERC's Preliminary Determinations Concerning *Pro Forma* OATT Scheduling Protocols

- FERC made a preliminary determination that the *pro forma* OATT's hourly scheduling protocols are no longer just and reasonable and, in fact, may be unduly discriminatory as the default scheduling time periods.
- FERC preliminarily determined that hourly scheduling protocols may expose transmission customers (especially VERs) to "excessive or unduly discriminatory" generator imbalance charges and may not allow transmission providers to manage their transmission systems with maximum efficiency.

FERC's Preliminary Determinations Concerning *Pro Forma* OATT Scheduling Protocols

- FERC explained that because transmission schedules are typically set 20 to 30 minutes ahead of the hour, the forecast of a VER's output (upon which its schedule is based) may be 90 minutes old by the end of the operating hour.
- Because of a VER's limited ability to adjust its schedule during the hour, generation output may not "match" the associated transmission schedules for the facility; the mismatch may result in an unnecessary reliance on a public utility transmission provider's reserves.

FERC's Proposed Amendment to *Pro Forma* OATT's Scheduling Procedures

- FERC proposed to amend the *pro forma* OATT's scheduling procedures to provide transmission customers the option to schedule transmission service on an intra-hour basis, at intervals of 15 minutes.
- Under the proposal, corrections to schedules can be made up to 15 minutes before the next relevant scheduling interval.
- FERC explained that the proposed transition to intra-hour scheduling is meant to better match generation output and transmission scheduling.
- Any additional cost associated with intra-hour schedules may be recovered through Schedule 1 of the *pro forma* OATT.

Data Reporting and Power Production Forecasting

- **Greater "Situational Awareness":**
  - In the VER NOPR, FERC stressed that it believes that advanced power production forecasting tools and procedures would provide public utility transmission providers with greater "situational awareness" of their bulk power systems and greatly assist utilities to manage their bulk power systems on a real-time, near-term and long-term basis.
  - FERC consequently preliminarily found in the VER NOPR that advanced power production forecasting "can play a significant role in removing barriers to the integration of VERs into the transmission system."
  - Applies to public utilities seeking VER-specific schedule 10 rate.

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Data Reporting and Power Production Forecasting

- Wind Generation: the Commission proposed to require wind generators to provide the public utility transmission providers to which they are interconnected site-specific information on, among other things:
  - temperature
  - wind speed/wind direction
  - atmospheric pressure
- Solar Generation: the Commission proposed to require solar generators to provide site-specific meteorological data including, but not limited to:
  - temperature
  - atmospheric pressure
  - cloud cover

Data Reporting and Power Production Forecasting

- The Commission did not provide a comprehensive list of data that must be shared, but instead indicated that the public utility transmission provider and interconnection customers should negotiate what data will be shared.
- These data requirements would apply <u>prospectively</u> and not to existing LGIAs.

Data Reporting and Power Production Forecasting

- With respect to operational data, the Commission also proposed to revise the *pro forma* LGIA to require interconnection customers whose generating facilities are VERs to report to public utility transmission providers any forced outages that reduce the generating capability of their resource by 1 MW or more for at least 15 minutes or more.
- This information allows a public utility transmission provider to ascertain which fluctuations in VER production are the result of an outage or weather conditions.
- This requirement would also apply <u>prospectively</u> and not to existing LGIAs.

Historic Ability to Recover Costs Associated With Generator Imbalances

- FERC explained that a cost recovery “gap” presently exists for the recovery of the capacity costs associated with the mitigation of generator imbalances.

Imbalance Type	Capacity	Energy
Generation	Gap	Schedule 9
Load	Schedule 3	Schedule 4

RECENT FERC PRECEDENT ON VER INTEGRATION

- **<u>Northwestern Corporation (Dkt. ER09-1314)</u>: Proposal to require exporting wind generation to:**
  - Establish their own BAA and operate independently from Northwestern BAA.
  - Dynamically schedule their generation out of Northwestern's BAA into another BAA (including the installation of necessary metering/telemetry equipment); acquisition of firm transmission service to telemeter generation into another BAA.
  - Provide regulation reserves in an amount acceptable to Northwestern, including firm transmission service from and to the source of regulation.
- **FERC rejected the filing (without prejudice)**
  - Proposal conflicted with obligation to provide Generation Imbalance Service.
  - Proposal must support limitation to VERs.

RECENT FERC PRECEDENT ON INTEGRATION OF VERS

- **Puget Sound Energy (Dkt. ER10-1436): Proposed Schedule 12 requiring all wind generation within Puget Sound BAA to purchase (or self-supply through dynamic scheduling) "Within-Hour Generation Following Service"**
  - Percentage of wind generator's installed capacity that must be backed-up, determined based on data from the most recent calendar year to determine incremental variability of wind generation
  - Incremental monthly cost of reserving one kilowatt of fast starting and quick responding gas-fired generation
    - Based on "proxy" peaking gas generation as opposed to base load hydro (or system average)
- **FERC rejected the filing (without prejudice)**
  - FERC rejected the use of an incremental rate based on proxy generation.

RECENT FERC PRECEDENT ON INTEGRATION OF VERS

- **Westar (Dkt. ER09-1273, ER11-2646): Proposed Balancing Area Services Agreement and new Schedule 3A that will require customers exporting from the Westar BAA to purchase (or self-provide) generator regulation and frequency response service**
  - Schedule 3A rate = Schedule 3 rate × amount of generation capacity for which Westar is providing regulation service × "Regulation Percentage" based on fuel type
    - "Regulation Percentage" represents the amount of capacity Westar is required to commit, per MW of generation, in order to provide regulation service for a generator
      - 1.14% Dispatchable Resources
      - 4.02% Non-Dispatchable

        (January 7, 2011 revised Compliance Filing)
- **FERC accepted the proposal on an interim basis until SPP BAA consolidation/ancillary services market becomes operational (expected 2013).**

Generator Regulation and Frequency Response Service – Proposed Schedule 10

- **<u>New Pro Forma Schedule 10</u>:**
  - The new Schedule 10 provides a mechanism to recover the costs of capacity underlying the generator regulation reserves used to mitigate generation imbalances, both when the relevant transmission customer is serving load within the transmission provider's BAA *and* when the customer is exporting to load in other BAAs.
  - A transmission customer must either take Generator Regulation and Frequency Response Service from the relevant public utility transmission provider or demonstrate that it has satisfied its regulation service obligation through "dynamic scheduling" of its generation to another BAA or self-supplying regulation reserve service from generation or non-generation resources.
  - The public utility transmission provider cannot charge the transmission customer for regulation reserves under <u>both</u> Schedule 3 and the new Schedule 10.

Generator Regulation and Frequency Response Service – New Schedule 10

- The Commission proposes that its new Schedule 10 should apply to *all* transmission customers delivering energy from all generators – not just VERs – located within a public utility transmission provider's BAA.
- The rate underlying the proposed Schedule 10 will be comprised of two components.
  - a per-unit rate for regulation reserve capacity.
    - The regulation reserve capacity requirement is the cost and volume of unloaded generation or other non-generation resources held in reserve to accommodate load fluctuation (under Schedule 3) and generation fluctuation (under the new Schedule 10).
  - a volumetric value for reserve capacity.

Generator Regulation and Frequency Response Service – Proposed Schedule 10

- **Same Rate As Schedule 3:**
  - Because the services provided under both Schedule 3 and the proposed Schedule 10 are designed to recover the costs of holding regulation reserve capacity online and available to meet system needs, the Commission proposes to allow the same rate currently established in a public utility transmission provider's Schedule 3 to be used when charging transmission customers under proposed Schedule 10.
  - A public utility transmission provider may make a filing to propose a different rate. Such a filing would be required to demonstrate that "the per-unit cost of regulation reserve capacity is somehow different when such capacity is utilized to address system variability associated with generator resources."

Generator Regulation and Frequency Response Service – VER Specific Rate

- The Commission explained that where a subset of transmission customers "*causes a public utility transmission provider to procure a different per unit volume of regulation reserves than for other transmission customers*, public utility transmission providers may require that subset of transmission customers to purchase, or otherwise account for, a different volume of generator regulation reserves, commensurate with its relative impacts on the system."

Generator Regulation and Frequency Response Service – VER Specific Rate

- A public utility transmission provider may require a transmission customer delivering energy from VERs to purchase (or otherwise account for) a different volume of generator regulation reserves than a traditional generation resource if the proposal can be justified by data proving that VERs impose a different per unit impact on overall system variability than traditional generating units.
- A public utility transmission provider cannot apply different volumes of generation regulation service to transmission customers delivering energy from VERs *without implementing both the intra-hour scheduling and power production forecasting also proposed in the VER NOPR*.

BUSINESS AND POLICY IMPLICATIONS OF FERC'S PROPOSALS

- **Does intra-hour scheduling merely turn a generation imbalance into a load imbalance?**
- **What is power production forecasting and what data will be required?**
- **What should a utility do in the interim period if it wants to recover the cost of keeping capacity online and available to mitigate generation imbalances?**
- **How do you prove that VERS cause disproportionate costs on a power system?**
- **How will the FERC address non-jurisdictional utilities?**
- **What is the likelihood that FERC will implement its proposals?**

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QUESTIONS

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