

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

Integration of Variable Energy Resources

Docket No. RM10-11-000

**JOINT COMMENTS OF PUBLIC INTEREST ORGANIZATIONS
ON THE COMMISSION'S NOTICE OF INQUIRY**

Introduction & Summary

1. Variable Energy Resource (**VER**) integration is critical to long-term power system efficiency, grid reliability, and energy sustainability. Renewable VERs, more specifically, are fundamental to meeting our nation's most important energy and environmental policy goals. Because greater integration of these resources can significantly reduce power sector greenhouse gas emissions and other pollutants, conserve water, diversify our "in house" energy supply, and simultaneously create jobs and stimulate the economy—all important policy goals served by renewable energy—Public Interest Organizations (**PIOs**)¹ greatly appreciate the Commission's initiative to examine barriers to VER integration, and we urge Commission adoption of regulatory policy reforms that facilitate reliable, expeditious and cost-effective integration of these resources.

2. The Commission's Notice of Inquiry (**NOI**) has correctly noted that VERs present both new operational challenges for a grid structured around large central station steam generation plants and provide critically important economic and environmental benefits to the power system. To take advantage of these benefits, it is essential that the barriers to development and utilization of renewable VERs be addressed, and the Commission's NOI is an important step in that direction.

¹ PIOs joining these comments: **Center for Energy Efficiency & Renewable Technologies, Environmental Defense Fund, Fresh Energy, Natural Resources Defense Council, Northwest Energy Coalition, Office of the Ohio Consumers' Counsel, Project for Sustainable FERC Energy Policy, and Western Grid Group**

3. While Federal Power Act (**FPA**) requirements for just and reasonable rates and elimination of undue discrimination are fundamental to the Commission's responsibilities, the FPA uses these requirements to guide the Commission's underlying regulatory task of providing for affordable and reliable electric energy and transmission service in interstate commerce. Fundamental to the Commission's duty is ensuring that services are environmentally sustainable and congruent with public policy imperatives.

4. The energy and environmental policy imperatives of the 21st Century require the FERC to apply FPA requirements in new ways, evaluating elements of grid operation that go beyond traditional reliability and congestion relief to include environmental costs and risks, energy resource sustainability, and energy and transmission market impacts. Our new world requires consideration of "clean first" regulatory policies to facilitate energy efficiency, price responsive demand management, and integration of renewable resources, many of which are VERs.

5. Traditionally, except for instances noted in the NOI, the Commission has not focused on the unique characteristics of VERs to address undue discrimination. This is due, in part, to the fact that most Commission proceedings have been conducted in the context of a power system made up predominantly of dispatchable generation resources. Thus, Commission actions under FPA Sections 205 and 206 have not often had to deal with ensuring non-discriminatory treatment of generation resources inherently different than dispatchable generation. More recently, however, the Commission has begun to take account of the unique operational characteristics of VERs to ensure just and reasonable rates and to address potentially undue discrimination with respect to these resources.

6. In years past, the Commission has often revised policies to ensure that jurisdictional rates are just and reasonable and to prevent undue discrimination. In keeping with this approach, policies

and rules designed to address the needs of traditional industry technologies must be reexamined in light of new technology options, including VERs. In some cases, Commission reexamination of market rules and procedures will likely lead to major changes—i.e., updating required for the reliable integration of new technologies into the electric system. In light of the characteristics of the nation's changing generation portfolio, PIOs urge the Commission to acknowledge the need to accommodate VERs and revise, where needed, policies that unduly discriminate against these resources due to their unique characteristics in comparison with traditional sources of power. In our judgment, truly non-discriminatory rules and procedures will support the reliable integration of large amounts of VERs into our power system.

7. Reforms to enhance the flexibility and efficiency of the power system would make it easier for grid operators to accommodate all sources of variability, including load and existing power generators, which already produce significant levels of variability without VERs. Importantly, if regulatory policies make integrating variable resources unduly costly, or if VERs are subjected to inappropriate penalties and integration charges related to their unique characteristics, the growth of renewable resources will be inhibited. PIOs are concerned that without Commission direction on important VER integration issues, different balancing authorities may develop individual and potentially inconsistent approaches to integration and may adopt practices that penalize VERs for their differences, resulting in undue discrimination and in unintended economic disincentives to VER development. For example, renewable variable resources cannot be expected to perform like conventional power plants because they cannot control or store their fuel source, and they should not be unfairly penalized because of this characteristic. Thus, PIOs believe the primary focus of Commission reform efforts on VERs should be to adopt rules and procedures that will

cost-effectively increase system flexibility and better equip grid operators to meet all forms of variability on both sides of the meter.

8. PIOs will address some, but not all, of the Commission's NOI questions, focusing on policy rather than technical issues. In our view, reliable and cost-effective technical fixes are available (or will be developed) when the critical regulatory policy questions are resolved. Thus, we will address important policy issues to be addressed by the Commission.

A. Data & Forecasting

9. While current forecasting practices are seen as adequate for current levels of VER integration, forecasting will have to be improved as VER penetrations increase. Importantly, the integration of reliable wind forecasts into system operations, for example, should significantly reduce the costs of integrating wind energy into the grid. Without reliable forecasts, system operators in regions with large amounts of wind energy may have to maintain large amounts of reserves to accommodate potential variations in wind output. Reliable wind forecasting can significantly reduce the uncertainty related to wind output and, thus, reduce the amount of reserves needed to offset potential wind output variations. Most important among the changes needed are greater reliance on centralized forecasting and better utilization of the forecast information by system operators to balance the variability of load and system resources.

10. PIOs believe that requiring coordination between grid operators and VER output forecasters would facilitate VER integration, and we think that centralized balancing area forecasting with near real-time local updates would be the most accurate, efficient way to forecast VER output. Simply aggregating decentralized forecasts could be duplicative, more costly, and less accurate for the region's fleet of VERs. Centralized forecasting would also reduce the risk of unintended perverse incentives for forecasters or traders to game the system with biased forecasts.

11. Further, if centralized forecasts are used for determining the scheduling and commitment of resources, there would be no need to create incentives for wind generators to schedule according to their best available information. Thus, the Commission should require grid operators to build centralized wind forecasts into their operating procedures, as they do for load forecasts, relying on local forecast information nearer real-time to make appropriate adjustments.

B. Scheduling Flexibility & Incentives

12. PIOs believe that reliable and cost-effective integration of VERs requires greater flexibility in scheduling system resources, including shorter scheduling intervals that would allow VERs to submit more accurate schedules and system operators to manage overall system variability more efficiently. Under the hourly scheduling procedures now used in many systems, grid operators rely on expensive reserves to accommodate the intra-hour variability of load, VERs, and other resources, when shorter scheduling intervals would allow existing generators to provide much of the needed flexibility less expensively. Under current practices the outputs of many generators are needlessly held constant for full hourly intervals, and such scheduling rules artificially limit the responsiveness of conventional generation, often making it necessary to use very expensive regulation services to accommodate system variability.

13. The Commission should encourage sub-hourly scheduling both to reduce VER integration costs and to address intra-hour variability of loads more efficiently on systems without VERs. Sub-hourly scheduling of generation can significantly reduce the need for regulation service, and studies suggest that intra-hour scheduling and dispatch can reduce the costs of integrating VERs dramatically.² Thus, PIOs urge the Commission to require system operators either to implement

² Bonneville Power Administration has concluded that wind integration costs on their system could be reduced significantly by moving from an hourly dispatch to sub-hourly dispatch intervals, and the Avista wind integration study similarly found wind integration costs would be reduced substantially by moving from hourly to sub-hourly dispatch intervals. See: <http://www.uwig.org/AvistaWindIntegrationStudy.pdf>

intra-hour scheduling or to explain why such scheduling would not be technically feasible or cost-effective on their systems.

14. PIOs believe it is important to update existing operating procedures to accommodate the full integration of VERs into the electric system. Providing for intra-hour scheduling and dispatch, as well as relying on more flexible system resources such as demand response and other energy management and storage resources to address system variability, can increase grid efficiency and reduce system costs. Procedures that do not allow VERs to adjust their schedules during the hour or to submit shorter scheduling timeframes, we believe, unreasonably prevent operators from using the full operational flexibility of their system resources to integrate VER outputs in the most efficient and cost-effective manner.

C. Day-Ahead Market Participation & Reliability Commitments

15. Under current market rules, VERs face significant risks in day-ahead markets because day-ahead schedules are financially binding. Without the ability to adjust schedules closer to real-time (when, for example, weather forecasts are more accurate), they can be severely penalized in the real-time markets. If VERs were permitted to adjust their schedules closer to real-time, their participation in the day ahead markets would likely increase and their participation could make balancing loads and resources in real-time more efficient.

16. The existing day-ahead approach to unit commitment, which was developed when grid operators relied almost exclusively on fossil generation, needs to be reexamined. As VERs become an increasingly important part of the resource mix, it is critical to take a fresh look at day-ahead commitment requirements and add as much flexibility as possible to facilitate VER participation. Reducing lead time for unit commitment, along with allowing greater flexibility in updating schedules as forecasts are updated, would make it easier for VERs to participate in

forward markets and unit commitment processes. The use of centralized probabilistic forecasts of VER outputs, supplemented with local forecast updates closer to real-time, may be the most efficient and cost-effective way to minimize the risk of having insufficient generating resources available to meet system load requirements.

D. Balancing Authority Coordination

17. PIOs urge the Commission to encourage, if not require, balancing authority consolidation.

At a minimum, Commission rules should require coordination between balancing authorities that will provide a level of functionality that is comparable to that achieved by consolidation. Such functionality is essential to timely and cost-effective grid integration of VERs. It is indisputable that smaller, individually operated balancing authorities have higher VER integration costs than balancing areas with larger loads and more generation.

18. It is also important to note that balancing areas with load and generation diversity, as well as flexible generating and demand resources, have an easier time managing the reliable integration of VERs. The geographical diversity of larger balancing areas, for example, can reduce the aggregate variability of wind energy, and large balancing areas provide a wider array of flexible resources to accommodate variable VER generation at low cost.

E. Reserve Products & Ancillary Services

19. PIOs contend that reforms to enhance the flexibility and efficiency of the power system will make it easier to accommodate all sources of variability and that they are essential to integrating significant amounts of VERs. Thus, we believe that system operators must have a broad array of reserve products available for maintaining reliability as VERs, with their unique characteristics and requirements, are added to the grid. To help address the need for additional and lower cost reserve products, PIOs urge the Commission to consider market rules that support investment in

and reliance on low cost demand management resources and energy storage to provide reserve and ancillary service products needed for VER integration – reserve products, for example, that are appropriate for VER ramping events, which are unlike system contingency events such as central station trips and require different amounts and types of reserves that can be provided at lower cost. The use of demand-side and energy storage resources to facilitate VER integration has an important additional benefit: emissions reductions related to adding renewable VERs to the grid are not off-set by emissions from conventional power plants to provide the reserves or other ancillary services.

F. Capacity Markets

20. The Commission should consider adoption of compensation levels and other market rules that facilitate greater investment in the demand-side resources critical to full and cost-effective integration of VERs. For example, the Commission should consider market reforms that permit VERs to join with energy storage or other demand side resources to bid into forward capacity markets and receive payments that reflect their combined capacity and reliability benefits. The Commission can look to the experience of ISO-NE in providing for combined resource bidding into its Forward Capacity Market.

Respectfully submitted,

By: /s/ filed electronically

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