



During the Bush Administration, the Department of Energy estimated that wind power, within the appropriate policy framework, could supply 20 percent of the nation's electricity by 2030. This would amount to an increase from today's 25 GW to over 300 GW of wind power capacity. To achieve these results, Congress will need to enact a national renewable electricity standard (RES) and provide this Commission with additional regulatory authority and direction over the planning, siting and cost allocation associated with much-needed grid infrastructure. AWEA and the Solar Energy Industries Association (SEIA) recently released a white paper that outlines a federal legislative approach to advance transmission infrastructure through interconnection-wide transmission planning, interconnection-wide transmission cost allocation, and federal siting.

But an RES and increased transmission investment are not, by themselves, enough. This Commission must also use its authority to make significant changes to the way the grid is structured and operates. We support the NERC report on integrating variable resources. The report essentially says that variable generation must be planned for and it describes the changes that must be made in areas where significant variable generation development is likely. My comments today will focus on the operational reforms that are necessary to ensure that non-dispatchable resources, including wind and solar, can thrive.

There are many things FERC can do within current jurisdiction to improve wind integration. I will highlight a few items that could result in a significant reduction in wind integration costs, while facilitating increasing levels of wind penetration.

1. **Continue to Support RTOs --** I have participated in several other technical conferences hosted by the Commission and, on each occasion, spoke on behalf of RTO markets. By providing a broader geographical scope and essential market services, it is much easier to integrate variable resources located in RTOs regions. It is vital that the Commission maintains existing RTOs, prevents utilities from leaving RTOs, and encourages other utilities to either join existing RTOs or form new ones.
  
2. **Consolidation of Balancing Areas – Even where RTOs are not currently operating, finding ways to consolidate control areas is critical** As dozens of utility-led studies in the US and Europe have already demonstrated -- a high wind penetration can be reliably accommodated at relatively modest integration costs in the \$3-5/MWh range. The key operational change that is necessary is the consolidation of the current balkanized system of around 125 separate balancing areas into a more rational, regional system. These studies consistently find that more wind can be accommodated at lower integration costs when there are larger balancing areas, rapid scheduling and dispatch time intervals, robust transmission grids, greater use and integration of wind forecasting, and the availability of flexible or dispatchable generation and load. A larger balancing area provides more access to generation over a broad regional area to better accommodate the variations in electric supply and demand and reducing aggregate variability. Larger balancing areas may also

lead to greater diversity in the location of wind facilities. Both of these outcomes (access to generation and wind diversity) will result in significantly lower integration costs.

Absent larger balancing areas, wind integration costs can escalate quickly and may drive wind development out of a particular region. For example, BPA operates a small to medium-size control area (~10,000 MW peak load) balancing area with significant potential for wind resource development. They currently only have access to their own generation to provide integration services. BPA is currently proposing a significant increase to their wind integration rate (up to 400%) due to the increasing penetration of wind on their system. Absent a consolidation with another control area, either physically or virtually, or some other means of accessing the flexibility in other generation in the region, these costs will continue to increase and may reach levels where either it is more cost-effective for wind generators to form their own balancing area than to take services from BPA or discontinue developing project in their balancing area.

3. **Market Mechanisms** -- There are also market mechanisms that would assist in accommodating higher levels of renewable integration.
  - a. Promoting region-wide load following markets and ancillary services markets in regions where no RTO markets exist would help further

enhance renewable integration in a way that does not disrupt regulatory structure and market designs of the regions. Developing regional load following and ancillary services markets would alleviate the individual balancing areas burden to provide all ancillary services from their own resources. Renewable integration costs would be further minimized by allowing any generation or demand resource, regardless of ownership, to offer its flexibility to the system operator.

- b. In addition, the Commission should promote faster (sub-hourly) power system dispatch and scheduling to allow system operators to more quickly respond to power system output variations. Wind power can vary significantly over an hour, but is relatively constant over shorter periods of time (ten-minute intervals). Therefore, the shorter the dispatch and scheduling window, the lower the incremental following costs for higher levels of wind penetration. Regions with hourly dispatch and scheduling regimes have to rely on regulation services to respond to output variations, and this is typically a more expensive way of responding to these variations. Most of the ISO and RTO markets operate both sub-hourly markets and have efficient ancillary services markets. These markets typically have lower integration costs.

4. **Wind Forecasting** -- Improvements in wind forecasting can significantly reduce the uncertainty related to wind output in the hourly to daily time frame, thereby reducing the amount of reserves necessary to accommodate potential variations in wind output. Integrating state of the art forecasting into power system operations has only just begun. In an event that occurred on February 26, 2008 in ERCOT, wind dropped off at the same time as a fossil generation outage and an unexpected load increase (both of which were greater than the change in wind output), and the wind forecasting system that was in test mode saw the change coming so the wind part of that sudden imbalance could have been covered by adding generation. More accurate wind forecasts should be incorporated into power system operations to reduce scheduling inaccuracies of wind facilities.
  
5. **Transmission** -- Finally, more flexible transmission services and region-wide tariff structures will result in opportunities to lower renewable integration costs. In most regions with RTOs and ISOs, transmission is flexible (no physical schedule and financial transmission rights). The remainder of the country still requires physical schedules based on transmission capacity. Therefore, renewable resources pay to use the transmission system 100% of the time whether they are using it or not. The Commission's requirement for a transmission owner to offer Conditional Firm Service and redispatch service will result in more efficient uses of the transmission system and benefit renewable resource development. However, because these services can be re-

negotiated every two years, there is still uncertainty when trying to finance a project.

Region-wide transmission tariffs would eliminate inefficient “pancaked” transmission charges where customers must pay a tollgate-type fee across every utility service territory it delivers across and would facilitate regional cost-sharing. This would lower the delivery charge associated with moving remote renewable resources to load centers.

Thank you again for the opportunity to speak today. Iberdrola Renewables and AWEA stand ready to work with the rest of the electric industry and state and federal regulators on these challenges.