Energy Policies under a Trump Administration: The Implication for Distribution Utilities & Grid Modernization

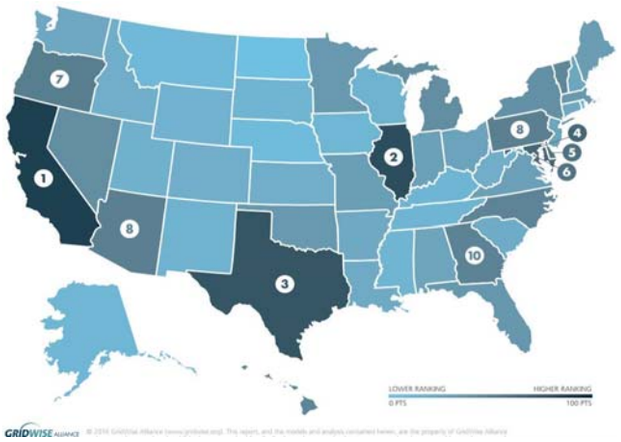
By Parag Nathaney and Rachel Finan

Parag Nathaney and Rachel Finan are associates of ICF Incorporated. Parag Nathaney may be reached at Parag.Nathaney@icf.com

See footnotes at end of text.

The U.S. power and utilities sector is in the midst of significant transformation and uncertainty, driven by declining load growth, innovative technologies, evolving regulations, changing consumer preferences and the emergence of non-utility competitors. The recent Presidential transition has added even more ambiguity as to the future of the industry, with some pontificating that it's a "new dawn" for fossil fuels and the death of environmental regulations, while others assert that economics will keep renewables thriving despite President Trumps' promise to halt clean energy initiatives.[1] However, the trend toward utility grid modernization is one subsection of the industry that may remain largely on course, potentially even accelerating under new federal policy shifts.

Capital spending by the largest investor-owned U.S. electric and gas utilities is expected to be significant going forward. Utility grid modernization initiatives include a suite of measures such as integration of information and communication systems to manage the grid efficiently; greater automation of decision making; enhanced visibility into grid operations and the ability to collect, synthesize and assess data at increased levels of granularity. The primary drivers of industry spending for grid modernization include utility programs to replace aging infrastructure, implement smart grid technologies, and integrate greater amounts of renewable/distributed energy technologies. The recent change in administration and its emphasis on infrastructure spending is expected to further expedite the pace of these grid modernization initiatives across the U.S.



Figyre 1: Overall Results: GridWise Alliance Grid Modernization Index ranking of all 50 States & DC based on movement toward a modernization grid.

There has been a growing acknowledgement that Distributed Energy Resources (DERs) like rooftop PV, electric vehicles and batteries have seen high levels of deployment recently and are expected to see significant penetration in the near future, due to declining costs and changing consumer preferences. Some states such as New York, California, and Minnesota have already acknowledged this trend and initiated regulatory proceedings focusing on innovative rate design and mandates that further enhance customer adoption of these technologies. Even states such as Pennsylvania, Illinois and recently Ohio have made strides in grid modernization recently, partially due to supportive state policies.

The Federal Energy Regulatory Commission (FERC) acknowledged these industry changes in its Notice of Proposed Rulemaking (NOPR) on Energy Storage and DER aggregations, which mandates Independent System Operators/Regional Transmission Organizations (ISOs/RTOs) to develop participation models that allow DERs (mainly in the form of aggregates) to participate in the wholesale markets and provide all eligible services: energy, capacity and ancillary.[2] DERs are connected to the distribution system and their dispatch by ISOs/RTOs to service wholesale market needs will need closer coordination with distribution utilities, which may in turn require utility investments in new analytical capabilities, technologies, tools, and planning approaches. The recently issued FERC NOPR on energy storage and DER aggregation is expected to provide a further impetus to grid modernization initiatives, especially when considered against the backdrop of the previously discussed drivers.

In addition to mandating ISOs/RTOs to allow DER aggregations to participate and provide energy, capacity and ancillary services to the wholesale market, FERC also instructs ISOs/RTOs to explore the opportunities of allowing DERs to provide services which have traditionally not been procured through market mechanisms, such as primary frequency response and black-start. Some of these services may primarily involve power 'injection' into the distribution system from customer-sited DERs. 'Injection' has a significantly different impact on the distribution system as compared to 'load reduction'. The impact

of load 'reduction' or 'curtailment' through demand response on the distribution system is relatively well-understood by the utilities, due to the history of demand response programs in the US.

Injection requires enhanced real-time ability to monitor and control the system, especially for coordinated injections from DER aggregations. The ability of the utilities to do so currently is limited. The enabling technologies to enhance this capability include distribution automation, DER management system (DERMS), etc.

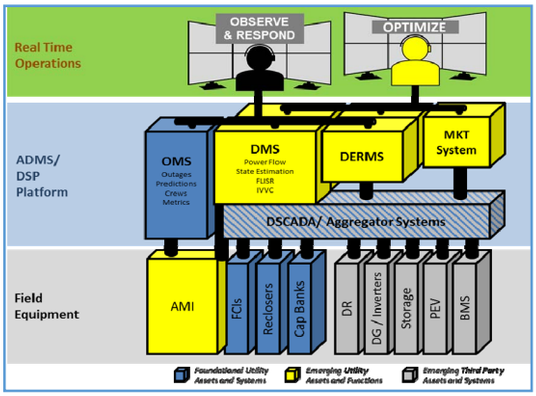


Figure 2: Enabling Technologies to Enhance Real-Time System Monitoring & Control
Source: Joint Utilties of New York, Supplemntal Distribution System Implementation Plan, November 2016.

In addition to enhanced real-time monitoring and control, utilities may require a revised methodology for the DER interconnection process that is currently in place today. The current interconnection process does not necessarily evaluate the impact of injections into the distribution system from sub-resources forming DER aggregations acting in tandem to ISO dispatch instruction. In cases when the dispatch of aggregated DER by the ISO/RTO causes reliability issues on the distribution system, the utilities may need to curtail the response of it. However, this analysis will require utilities to simulate the impact of DER aggregations' injection in real-time and then subsequently responding to the outcome of the simulation. This will require investments which develop enhanced real-time monitoring, control and automation of the grid. Such investments have the potential to be prioritized under the new Presidential administration's push for infrastructure spending.

Further, the FERC NOPR, by proposing to lower the barriers to entry for DERs into wholesale markets, may also necessitate utilities to develop more granular and sophisticated forecasting and planning techniques that assess the impact of DER performance on the local system and utilities' procurement from the wholesale markets. This also presents utilities an opportunity to allow DERs to connect to the grid strategically; i.e., where DERs can provide the greatest locational benefits. This may help utilities actively incorporate DERs as a planning tool to reduce, delay or avoid capital expenditures. However, this needs to be accompanied by regulatory reforms which incentivize utilities to avoid capital expenditures rather than expanding them. Deciphering locational value of DERs requires developing analytical tools which can process granular system information. This presents an opportunity to utilize infrastructure spending on advancing analytical capabilities.

It is expected that DER-related activity will escalate across the country as ISOs/RTOs begin to comply with the NOPR. Thus, states under the purview of the ISOs/RTOs that have not seen substantial DER participation or DER penetration currently, may also begin to notice some level of activity. This may expedite the need for grid modernization in these regions as well.

Thus, while the presidential transition has undoubtedly injected uncertainty into the energy and power industries in general, the priorities for utilities may remain largely the same. The new administration's emphasis on infrastructure development, combined with the recent FERC NOPR and continuously changing consumer demands will continue to drive utilities – especially those backed by supportive state regulatory commissions – toward grid modernization initiatives. Specifically, utilities will be driven to develop: more granular and sophisticated forecasting and planning tools/techniques to capitalize on the locational value of DER; a revised methodology for DER interconnection that takes simultaneous power injection from DER aggregations into account, not simply power curtailment; and strategies for articulating the need for investment in enabling capabilities (innovative technologies, analytical tools, workforce development, etc.) in the context of infrastructure development and reliability.

Footnotes

[1] See Chicago Tribune "Oilmen take Washington, signal dawn of new U.S. energy era, " 2016. http://www.chicagotribune.com/business/ct-washington-trump-cabinet-oil-interests-20161214-story.html, also Bloomberg news, "Economics will keep wind and solar energy thriving under trump," 2016. https://www.bloomberg.com/news/articles/2016-11-23/economics-will-keep-wind-and-solar-energy-thriving-under-trump

[2] Federal Energy Regulatory Commission, "Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators," November, 2016. https://www.ferc.gov/media/news-releases/2016/2016-4/11-17-16-E-1.asp#.WKcBI28rKUl