Council of Industrial Boiler Owners

Technical Focus Group, Energy & Environmental Committee Meetings

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# Update on FERC, NERC, DOE & Congress

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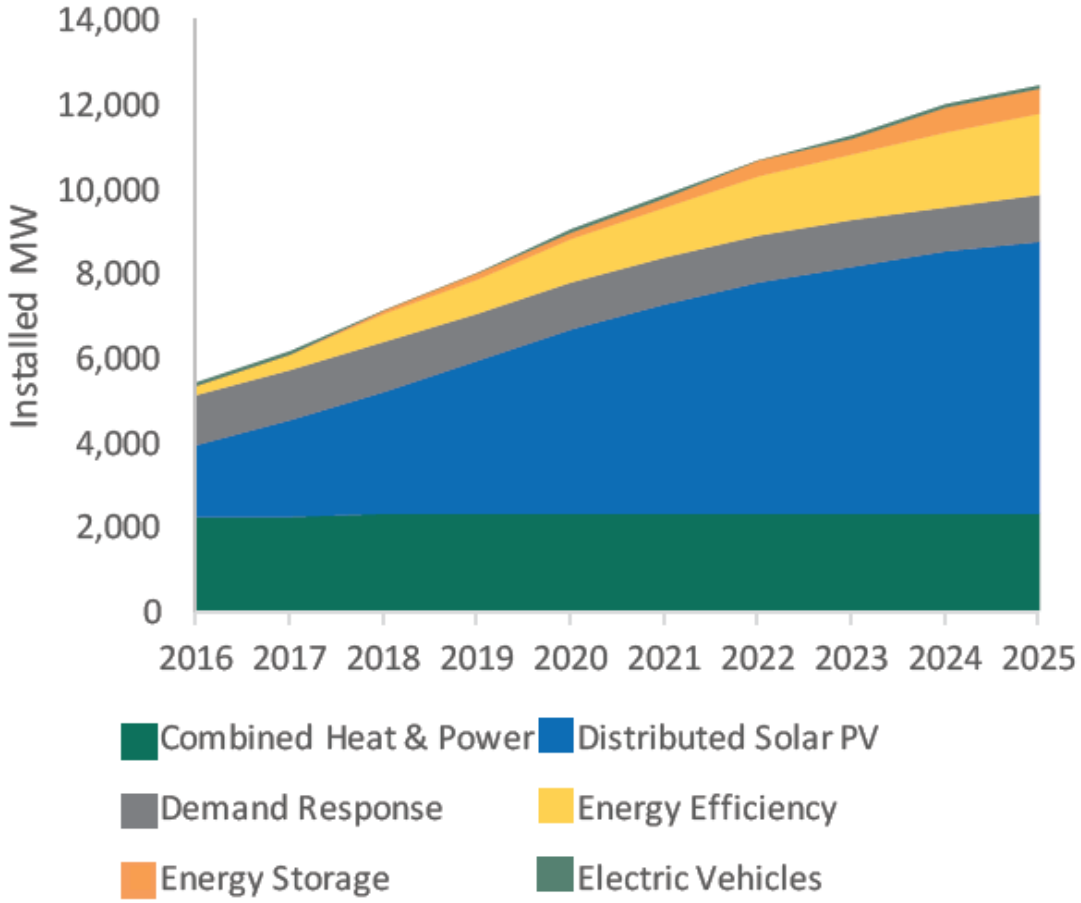
# Overview

- Trump Administration is now eight months old.
- The pace of appointments to important positions at FERC, DOE and EPA has been painstakingly slow.
- FERC's quorum – and ability to act in any meaningful way – was restored in August. Significantly increased activity is expected this Fall.
- DOE & EPA remain shorthanded but in August DOE released an important grid reliability report
- Both houses of Congress have energy packages in the works. Congress seems to be acknowledging that the electric utility industry is changing.
- NERC continues to develop the reliability rules necessary to "keep the lights on."

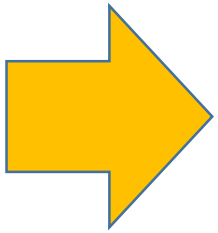
# Is This Where We are Headed?

## DER Forecast in Southern California Edison Service Territory Expected to Serve 50% of System Peak of 25,000 MWs



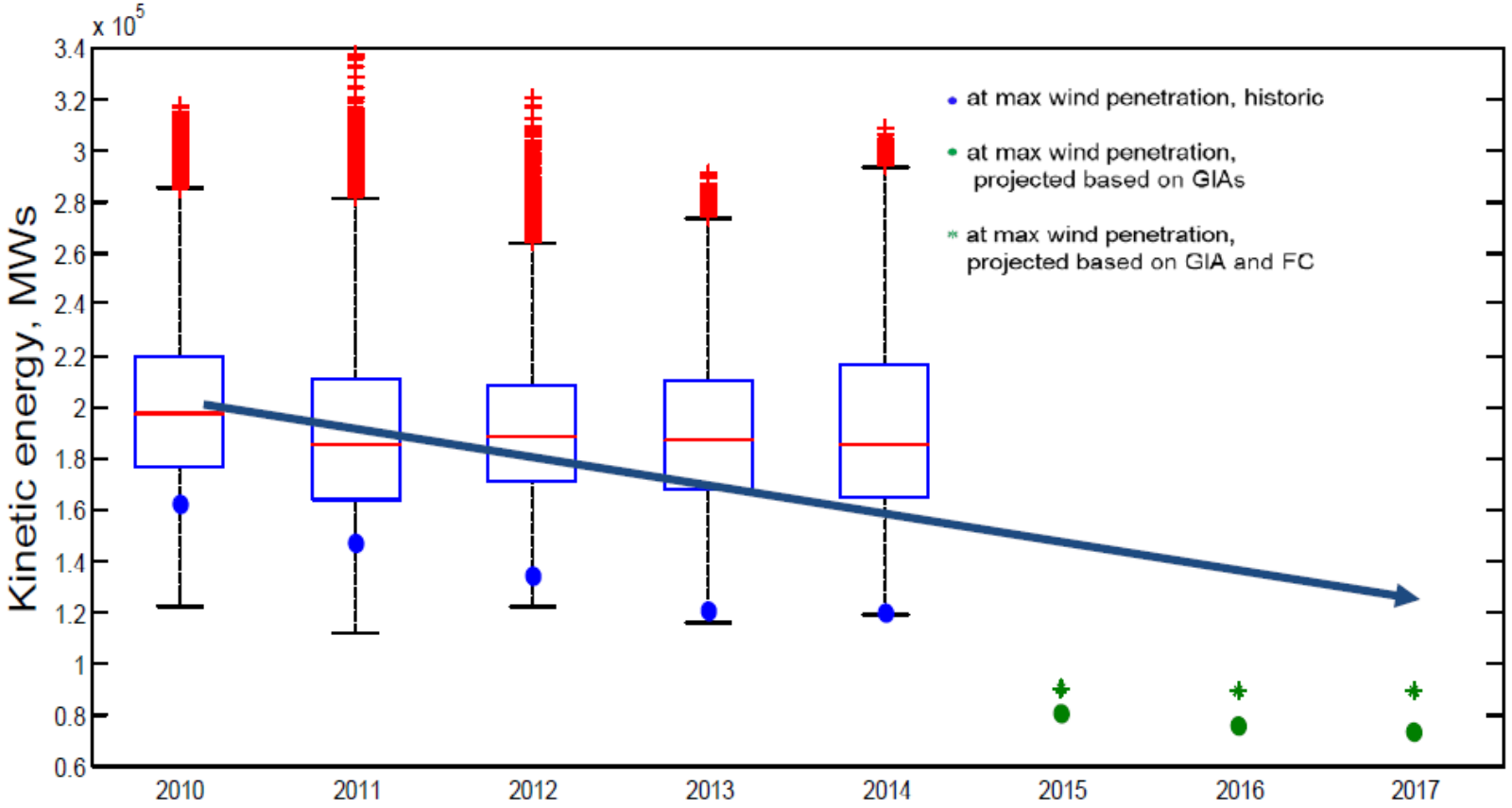
# Changing Resource Mix
## Impact on Grid Frequency

Traditional resource mix was dominated by synchronous generation:
**Baseload**
**Cycling**
**Peaking**
Synchronous inertia is an important network externality



State/Federal policies and market forces that promote **DER** are reducing the amount of synchronous generation that is available to support system reliability. This increases frequency deviations.

# Synchronous Inertia is Declining



# The Situation According to NERC

- The electric power system is transforming to a resource mix that relies less on coal and nuclear while integrating more natural gas, wind, solar, distributed generation, and demand-side resources.
- Additionally, the power system will change further as microgrids, smart networks, and other technologies continue to be deployed.
- Recognizing that these changes represent a fundamental shift in the operational characteristics of the power system with potential reliability implications, NERC assessed the impacts and identified measures to monitor continued grid reliability and resiliency.
- Generating resources must provide frequency support, voltage control, and ramping capability as **Essential Reliability Services (ERS)** to balance and maintain the electric grid. Without these minimal characteristics, the grid could not be operated reliably.

# Essential Reliability Services (ERS)

- **Frequency** – Frequency support is the response of generators and loads to maintain the system frequency in the event of a contingency. The frequency support response generally consists of a combination of immediate inertial response, fast frequency response, primary frequency response, and some slow responses to supplement the resources that have responded more quickly.
- **Ramping** – Ramping is related to frequency, but more in an "operations as usual" sense rather than after an event. Changes in the amount of non-dispatchable resources, system constraints, load behaviors, and the generation mix can impact the ramp rates needed to keep the system in balance.
- **Voltage** – Voltage must be controlled to protect the system and move power where it is needed. This control tends to be more local in nature, such as at individual transmission substations, in sub-areas of lower voltage transmission nodes and the distribution system.

# Staff Report to the Secretary on Electricity Markets and Reliability


**August 2017**

# DOE Grid Reliability Report
## Key Findings

- Cheap natural gas, weak demand for power, and a push for renewables have combined to doom high-cost coal and nuclear generation.
- Hydropower, nuclear, coal, and natural gas power plants provide Essential Reliability Services (ERS) and fuel assurance critical to system resilience.
- Market designs will need further reform to address services essential to grid reliability and resilience.
- Energy and capacity markets presently provide adequate reliability. Markets are only now beginning to recognize and compensate resilience-enhancing resource attributes. More work is needed in order to ensure a resilient grid.

# DOE Grid Reliability Report
## Selected Recommendations

- **Wholesale Markets:** FERC should expedite its efforts with states, RTO/ISOs, and other stakeholders to improve energy price formation in centrally-organized wholesale electricity markets.
- **Valuation of Essential Reliability Services:** Where feasible and within its statutory authority, FERC should study and make recommendations regarding efforts to require valuation of new and existing ERS.
- **Bulk Power System Resilience:** Together with NERC, FERC, and regional entities, DOE should support utility, grid operator, and consumer efforts to enhance system reliability and resilience.
- **Grid R&D:** DOE should focus R&D efforts to enhance utility, grid operator, and consumer efforts to enhance system reliability and resilience.

# DOE Grid Reliability Report
## Final Word

"The implied assumption is that baseload power plants have reliability and resiliency advantages that other power generation technologies do not. This assumption, perhaps valid five or ten years ago, is no longer credible looking forward."

*Smart Electric Power Alliance*

# Resilience

- The new imperative is resilience.
- The original intent was that the power grid needs to be "hardened" to withstand "Black Swan" events. Recent events were the 2014 Polar Vortex, 2012 Hurricane Sandy and the 2012 Ohio-DC Derecho.
- NARUC Definition: "It is robustness and recovery characteristics of utility infrastructure and operations, which avoid or minimize interruptions of service during an extraordinary and hazardous event."
- Because Black Swan events are so rare, attempts to withstand them are difficult to justify on the basis of cost. Another word for resilience is reliability at any cost.

# Resilience

- NERC tends to address resilience in the context of a coordinated physical attack on the grid, a coordinated cyber attack or a geomagnetic disturbance.
- National Infrastructure Advisory Council: "Infrastructure resilience is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event."

# Resilience

- There are multiple plots going on – and not a little bit of rent seeking. DOE Report is silent on cybersecurity and climate.
- Resilience in Washington DC now means bailing out coal-fired and nuclear power plants.
- The challenge will be proving that baseloaded plants are critical infrastructure on an individual basis and the attributes that make them resilience can be monetized.

# Primary Frequency Response (PFR)

- PFR is an ERS, needed to ensure system reliability and stability in both real-time operations and also during system restoration events.
- It is the first stage of interconnection-wide frequency control needed to prevent Under Frequency Load Shedding(UFLS) and to prevent equipment damage.
- It is provided automatically by unit governors or equivalent speed control systems.
- Its response is in seconds and not controlled by any centralized authority.
- It is critical for controlling frequency in system restoration event.

# Primary Frequency Response (PFR)

- NERC's *State of Reliability Report* for 2015 explained that the three US Interconnections currently exhibit stable frequency response performance above their Interconnection Frequency Response Obligations.
- However, NERC has pointed out a historic decline in frequency response performance in both the Western and Eastern Interconnections. NERC identified several key reasons for the decline, mainly tied to the primary frequency response performance of generators.

# FERC PFR NOPR
## Docket No. RM16-6-000

- Issued by FERC on November 17, 2016
- Requires all new small and large generators to install and enable primary frequency response capability
- Applies to synchronous and non-synchronous resources
- Specifies governor or equivalent controls to be operated with maximum 5% droop and ±0.036 Hz dead band settings
- Requires timely and sustained response to frequency deviations
- Would prohibit any controls that override governor response

# FERC PFR NOPR
## The NOPR Does Not Propose

- That the requirements apply to nuclear units
- That the requirements apply to existing units
- A headroom requirement on generating facilities
- Any compensation for complying with the proposed requirements

# ELCON Response

- CHP units that are “sized to the load” generally cannot comply with this mandate. During any frequency event, the equipment’s responsibility is to protect itself and the steam host and not try to bailout the utility outside the fence. Hence the mandate will discourage new CHP.
- ELCON seeks an exemption for this category of CHP systems (much like the exemption given to nuclear plants), or …
- FERC is urged to adopt a market-based solution, i.e., establish a PFR market that provides compensation for the service and lets generators opt in.

# FERC Price Formation Initiatives

| Docket No. | Year | Pricing Issues | Final Rule |
|---|---|---|---|
| AD14-14-000 | 2014 | Price Formation in Energy and Ancillary Services Markets Operated by ISOs & RTOs | |
| RM15-24-000 | 2015 | Settlements Intervals & Shortage Pricing | ✔ |
| RM16-5-000 | 2016 | Offer Caps | ✔ |
| RM17-2-000 | 2017 | Uplift Cost Allocation | |
| RM17-3-000 | 2017 | Fast-Start Pricing | |

# What Will FERC Do?

**Interim Chairman Neil Chatterjee**:
"…generation, including our existing coal and nuclear fleet, need to be properly compensated to recognize the value they provide to the system."

**FERC Nominee Kevin McIntyre** (who is expected to become the Chairman once confirmed by the Senate): "FERC does not pick fuels among different generating resources …" But … "If confirmed to FERC, I would commit to looking very carefully at this issue and giving it the attention it deserves."

# House Energy Language

- **GAO Study on ISOs/RTOs** – GAO would be required to conduct reports on each RTO's and ISO's "market rules, practices and structures." The grid operators would be judged on a number of issues, such as just and reasonable rates; fuel diversity, reliability and advanced grid technologies. (Section 4221)
- **Capacity Markets** – RTOs and ISOs operating capacity markets would be required to provide to FERC an analysis of how the markets use competitive forces and include "resource-neutral" performance criteria. FERC would be required to report to Congress on whether each market meets the criteria and make recommendations for those that don't. (Section 215B)

# House Energy Language

- **Resilience** – The bill would establish a new federal ratemaking standard (under PURPA Section 111(d)) directing states to consider requiring all utilities to develop plans for improving the resilience of their systems. (Section 1107)
- **Resilience** – The legislation also establishes a competitive grant program for states and local governments for spending on resilience and reliability. (Section 1201)

# Senate Energy Bill, S.1460

- Section 2002. **Enhanced Grid Security** – Expands DOE programs addressing grid resilience to cyber attacks.
- Section 2301. **Grid Storage Program**.
- Section 2302. **Electric Grid Architecture, Scenario Development, and Modeling** – Evaluates impact of different mixes of DER and central station resources and DOE may recommend that NERC develop new standards to address impact of DER integration.
- Section 2303. **Hybrid Micro-Grid Systems** for Isolated and Resilient Communities.
- Section 2304. **Voluntary Model Pathways** – Develop model pathways for modernizing the electric grid.

# Senate Energy Bill, S.1460

- Section 2305. **Performance Metrics of Electricity Infrastructure Providers** –Report to Congress on the performance of the grid with assessments of measurable costs and benefits associate with the scenarios developed under Section 2302.
- Section 2306. **Voluntary State, Regional, and Local Electricity Distribution Planning**.
- Section 2309. **Report by Transmission Organizations on DER and Interconnected Micro-Grid Systems**.
- Section 2312. **Bulk-Power System Reliability Impact Statement**.

# Senate Energy Bill, S.1460

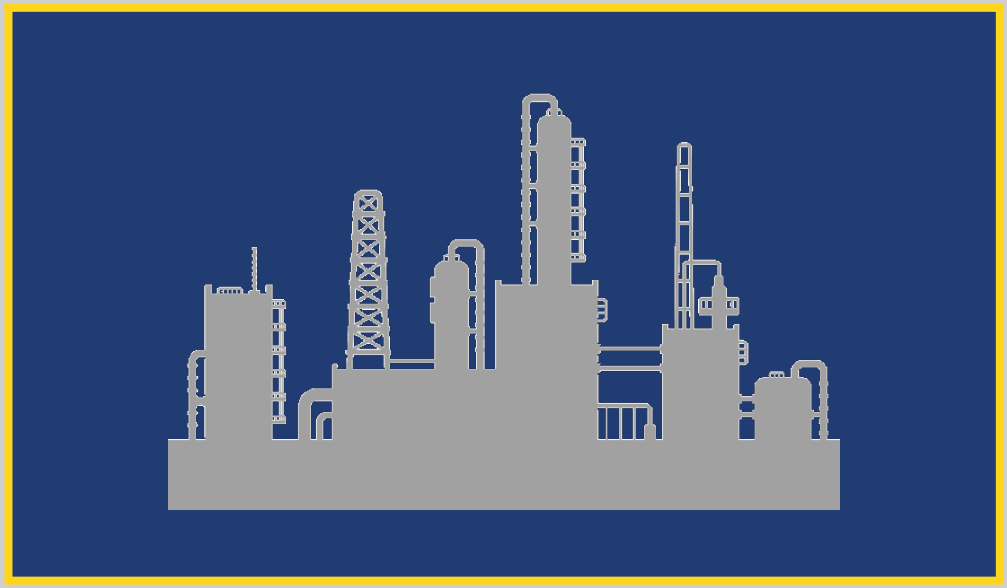
- Section 2313. **Report by Transmission Organizations on Diversity of Supply** – A report card from each ISO and RTO on the performance of their capacity market. Report is to be submitted to FERC.

# Senate Bill, S. 3062

- This bill amends the Energy Policy and Conservation Act to direct the Federal Trade Commission to initiate a rulemaking to consider including a special note prominently on any Energy Guide label for a product that contains Smart Grid technology.
- The note should include that: (1) the product features Smart Grid capability, and (2) the use and value of that feature depends upon the Smart Grid capability of the utility system and the utilization of that feature by the customer.

ELCON

Electricity Consumers Resource Council



**For more information, visit www.elcon.org**