

DOE – EAC Panel

REPRESENTATIVE TOM SLOAN

STATE OF KANSAS

TOM.SLOAN@HOUSE.KS.GOV

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Opportunities for DOE to EDUCATE on behalf of a stronger, more resilient and reliable electric grid system

- ▶ Technological capabilities at the customer and utility levels will transform the electric grid, role of traditional utilities, and customers' ability to monetize their self-generation, ancillary services, and storage capabilities. DOE options are limited, but essential, to influence the process and maintain voltage security/reliability.

Voltage Regulation

- ▶ Voltage regulation is important for engineers and technical nerds, but is little understood by the public (including public officials) – even those electing to self-generate
- ▶ Self-generation & storage will facilitate monetization of transactive energy transactions by traditional utility customers
- ▶ Such transactions have the potential to destabilize the electric grid and utility, regulatory, and consumer “business” models

You Know:

- ▶ Adding intermittent generation on distribution lines can adversely impact voltage levels, and hence system reliability; closing power plants can have the same adverse impact
- ▶ Addressing potential circuit instability due to self-generation and 111(d) regulations may require investments in monitoring, control systems, voltage regulation
- ▶ Failure to address potential problems will result in unhappy customers due to power fluctuations – unhappy customers contact utilities, regulators, and elected officials

DOE Potential Roles to help Regulators and Policy-Makers:

- ▶ Provide Webinars – for policy-makers and regulators (e.g., Why voltage regulation is important, how it is regulated, difference between static and dynamic regulation, what and why investments are necessary to maintain grid stability and reliability)
- ▶ Be innovative and put descriptive/interactive videos on U-Tube and have “Netflix-like” downloadable videos
- ▶ Develop game-like simulations (e.g., similar to the partnership with NARUC) as tutorials
- ▶ Provide Non-Technical Technical Conferences in conjunction with legislative and regulatory groups (e.g., tutorials at NARUC, NCSL, CSG, ALEC, NASEO, NASUCA, etc.)

Development Tools

- ▶ Develop and make available “Electricity Operations and Reliability Factors Explanations for Dummies” materials (even “comic book style like used with classic novels – Hunchback of ND)
- ▶ Example based from National Lab research, demonstration projects
- ▶ Help regulators and elected officials explain relevance to our constituents and understand why investments that may result in higher electric rates may be necessary

Provide Technical Assistance

- ▶ Develop voltage regulation, energy storage, etc. models for use by policy and regulatory staff to help us determine most appropriate courses of action in each of our states
- ▶ Develop models for use by state decision-makers on defining, assessing, measuring, and mitigating risks to the electric system AND of not modernizing the grid
- ▶ Do not tell us what to do (not your mission anyway), but provide tools for us to determine our most appropriate course of action

Provide Forward Thinking

- ▶ What issues are on the horizon that legislators and regulators should consider
- ▶ Provide a glossary of terms that state officials can use with their constituents (e.g., volt/var, resiliency, hardening) to explain why costs will continue to rise
- ▶ Provide simple explanations of what impact distributive generation has on system operations that can be shared with constituents

Resources available to DOE

- ▶ National Labs to develop models from which state policy-makers and regulators may choose
- ▶ EAC members – diverse, regularly deal with policy-makers and regulators and can provide guidance
- ▶ Members of this panel
- ▶ NCSL, CSG, NARUC, NASUCA, etc.

Examples of Assistance

- ▶ National Labs verify and model: integrated volt/var optimization as a means of meeting some energy conservation and efficiency goals under a carbon constrained scenario that a utility can implement without customers actively engaging
- ▶ BOLD, the AEP patented transmission technology, that effectively doubles transmission line capacity without requiring additional right-of-way footage
- ▶ Use of energy storage for voltage and frequency regulation, demand side management behind the meter, and as a flexible resource

Model, Explain, Validate

- ▶ DOE already supports pilot and demonstration projects , use the information gained to Model WHEN and WHERE new technologies or applications have value
- ▶ Explain how technologies and applications can help meet EPA 111 (d) rules and public goals for a lower carbon electric system
- ▶ Validate claims for technologies (e.g., BOLD, different types of energy storage, integrated volt/var controls) under specific conditions (e.g., load, price structures, generation mix)

Do Not Promote Best Practices

- ▶ Not equally applicable, affordable, feasible; and if I do not adopt the practice, I am a “bad” regulator, policy-maker, utility executive
- ▶ “Promote Options to Consider” - Alternative Technologies/Processes to Ensure Grid Reliability, Electricity Affordability
- ▶ Above all else – be visible, be informative, be an asset to the smallest/largest utility; the most/least well informed public official; the consumer looking for information

In Summary

- ▶ Use models and information to assist Regulators and Policy-Makers to know what questions to ask, how to explain technologies to the public, and how to help utilities and consumers monetize their opportunities, while safe guarding the reliability, resilience, and affordability of the electric system
- ▶ Do not duplicate what FERC, NERC, RTOs do with planning, but bring the planning models down to the level of policy-makers/regulators --
- non engineers
- ▶ Provide us the tools necessary to operationalize the QER voltage infrastructure deployment recommendations

Thank you for your attention.

▶ Questions?

Rep. Tom Sloan

tom.sloan@house.ks.gov

785-841-1526