

Transactive Energy Challenge Preparatory Workshop

March 24-25, 2015

Location: NIST, Gaithersburg, MD

Challenge Vision

Before Transactive Energy (TE) is accepted as a tool for solving today's grid challenges, there will be a need for trial implementations that test potential TE architectures, TE approaches, regulatory environments, communication protocols, software, and consumer devices. A first step towards enabling these kinds of trials is the development of modeling and simulation platforms that enable exploration and evaluation of specific TE approaches applied to various grid challenges. NIST believes that many of the key modeling and simulation components needed for this already exist. Sponsoring a TE Challenge can bring the various researchers and companies with simulation tools together with utilities, product developers, and other grid stakeholders to create and demonstrate modeling and simulation platforms applied to real grid problems. The products of the challenge will help the industry better understand the potential for TE and create a path for real-world trial implementations.

Together the workshop participants will work to shape a TE Challenge that will bring together the stakeholders, tools and technologies that can advance industry understanding of the potential for TE to deliver solutions for integration of distributed resources and load response for the grid.

Day 1 Agenda (Tuesday March 24)

Morning plenary session (8:00 – 12:00) (Heritage Room)

- 8:00 NIST welcome and TE Challenge Vision (Chris Greer, NIST)
- 8:10 DOE welcome (Chris Irwin, DOE)
- 8:20 Grid Challenges and Consumer Side Participation (Erich Gunther, Enernex)
- 8:40 TE Approaches and Experience (Ron Melton, PNNL)
- 9:00 Regulatory Interest and Challenges for TE (Chris Villarreal, CPUC)
- 9:20 Economics of Transactive Energy (Lynne Kiesling, Northwestern)

- 9:40 Break

- 10:00 Perspectives on the Current State of TE Modeling and Simulation
 - Jason Fuller (PNNL)
 - Auswin Thomas (Iowa State)
 - Janos Sztipanovits (Vanderbilt)
 - Santiago Grijalva (GA Tech)

- 11:40 Challenge process introduction and charge to the participants

Lunch in the NIST cafeteria (12:00 – 1:00)

Afternoon working session breakouts (1:00 – 5:00)

Breakout Locations	Group A (red dots): Heritage Room
	Group B (blue dots): Lecture Room B
	Group C (green dots): Dining Room A&B

1. *What are the models, simulation tools and co-simulation environments that we will need to simulate a range of TE approaches applied to multiple grid challenges?*

- a. What is the spectrum of modeling and simulation tools in use now that can be applied to transactive energy? How are they being used and by whom?
- b. What is the spectrum of TE approaches (e.g., DR and wholesale markets, transactive control, regional/local/micro retail markets) and grid challenges (e.g., grid planning, DER integration, bi-directional flows, distribution voltage fluctuations due to PV, transmission congestion, etc.) that we would like to include in simulations?
- c. What is a good working set of the above TE approaches and scenarios that might be used to define the scope of the Challenge and guide application of TE models and simulations?
- d. Which models and tools cover the widest range of TE approaches and scenarios? Which tools have the widest use, support, validation, etc.?
- e. Where are the gaps in models and tools?

2:30 Break

2. *What does success look like for the Challenge to accomplish that vision?*

- a. What are critical outputs from the Challenge? (e.g., model and simulation tool validations, data, TE scenario simulations, understanding value of different TE approaches, etc.)
- b. How might the outputs of the Challenge be used and who will use them?
- c. How might the TE landscape change as a result of the Challenge?
- d. How should the Challenge be structured to maximize benefit to participants and the stakeholder community?

3. *Who should participate in the Challenge?*

- a. What expertise and interests should be represented?
- b. Which people/companies NOT in the room might we want to target to participate in the Challenge?
- c. How should participants be organized? Teams? Individuals? Developers/users?
- d. How many teams are needed for a viable Challenge?
- e. What are the barriers to entry, if any, to participating?
- f. What are the right incentives to attract the right teams to this Challenge (gold, guts, good and/or glory)?

(Breakout session ends at 5:00 officially. There is no organized dinner or reception. Participants are encouraged to get together in groups and go to local restaurants.)

Day 2 (Wednesday 3/25)

Morning Plenary (8:00-8:45) (Heritage Room)

- Breakout leaders present results from Tuesday breakouts.

Morning breakouts (9:00-10:45) (same breakout groups as previous day)

- 4. What is the ideal Challenge process (timing, format, objectives) to achieve success?**
 - a. What process elements are required to accomplish the Challenge goals?
 - b. How to best use events to promote progress and showcase results?
 - c. What is the format of the final showcase/ report-out event? Is participation required?
 - d. What would be submitted by a team entering the Challenge?
- 5. What should Challenge teams be asked to document about their team effort?**
 - a. Team objectives, work plan, products?
 - b. What should be documented about the models and simulation environments used?
 - o What are the capabilities (for example: time scales, co-simulation capabilities, ability to model communication networks, visualization tools, breadth of application, etc.)?
 - o What performance metrics matter for the Challenge?
 - o What are the inputs needed for the environments?
 - o How are results validated?
 - c. What metrics might teams find useful in self-evaluating the effectiveness of their approach in analyzing any given TE approach and grid challenge?
 - d. What are the ways in which the value and effectiveness of the outputs could be demonstrated? (refer back to critical output question 2a from Tues afternoon)
 - e. How should the outputs of the Challenge be made available?
 - f. What happens with IP? Are solutions owned by teams or open source? Other?
 - g. Should the possibility of a special proceedings be explored for those who want to publish Challenge results in a journal?
- 6. What is the elevator pitch to call participants to join the Challenge?**

Late morning plenary (11:00-12:00)

- Quick report-out of morning breakouts
- Action plan: timeline and next steps.

Meetings complete at noon

Thank you for your participation!