Transactive Energy FAQ - a GWAC Resource document

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Q: How has the electric power system changed and why should I care?

A: After 120 years of relative stability the way we make electricity is rapidly evolving and becoming more dynamic. Just as other industries needed new tools to adapt to disruption, so too will the new energy reality require new tools.

Like any tool, it is helpful to know what you want to do before reaching out for the first thing that comes to hand. Would you use a wrench to drive a nail into a stud? Would you use a saw to measure a piece of wood? You could, and it might work, but you probably wouldn't want to use them again. So, if transactive energy systems (TES) are tools, what can they be used for?

Transactive Energy Systems provide a way for people and devices (entities, or, agents) that wouldn't traditionally interact with each other to do exactly that. It provides a framework for customers and distributed energy resources to be integrated into the electricity system in non-traditional ways.

1. What is Transactive Energy (TE)?

The term "transactive energy" refers to tools for coordinating the generation, consumption and/or flow of electric power within an electric power system. Using constructs such as price signals while considering grid reliability constraints, the term "transactive" comes from considering that decisions are made based on a value. Just as imbalances in supply and demand will influence any market, TE enables cost effective operation of the power system through exchange of mutual benefit among two or more entities.

2. Why is TE relevant?

The current electrical grid is not well equipped to manage changes in societal demands, consumer choice, and disruptive technologies. TE provides tools to manage the increasingly dynamic, complex, and distributed nature of the renewable energy and the energy system.

3. Who are the relevant stakeholders?

Stakeholders include those who currently influence and are responsible for generation, transmission, distribution and consumption of electrical power including environmental advocates. Decisions being made today by stakeholders will determine the availability of clean, cheap, reliable, electrical power for decades to come.

4. What is the value of TE?

One of the major benefits of TE is that stakeholders can seamlessly integrate their capabilities and manage their preferences. Furthermore, TE incentivizes all consumers and producers of electricity

allowing them to receive increased value (monetary, social or ecological) to proactively manage their power consumption and its characteristics.

5. What are the relevant policy issues regarding TE?

Increasing distributed energy resource adoption driven by customer choice and renewable energy policies requires a comprehensive re-imagining of the role of the distribution utility. This includes rethinking functional responsibilities, revenue model, and regulatory framework.

6. What are the key misconceptions of TE?

TE only uses peer-to-peer transactions. A TE system may include peer-to-peer transactions but need not be solely peer-to-peer in order to be considered transactive.

TE is only run and dictated by a central authority. While a central authority could choose to administer a TE system, such central administration is not a necessary characteristic of TE.

TE is the same thing as blockchain, or, uses blockchain. Blockchain technologies cover secure messaging and auditing capabilities which may or may not be included in a TE system.

7. How do TE and Interoperability relate?

Interoperability is the mechanism by which different types of systems, parties and assets can interact and be understood by one another and the electrical system. For members of a robust TE system to be integrated and function efficiently, parties must have a shared understanding of who, what, when and how value is to be transacted. Thus, without interoperability at the connected interfaces, TE becomes less valuable and more complex.

8. What is the state of adoption of TE today?

National labs and the Department of Energy have validated TE methods and technology. Policy and standards organizations are working to keep pace and offer guidance for stakeholders who are moving forward to pilot. Industry projects are exemplifying the value and methodologies offered by TE as commercially viable.

9. Who is championing the TE cause?

With support of the Department of Energy, the Grid Wise Architecture Council is leading development of the architectural and interoperability discussions giving stakeholders the tools to implement TE. Federal and international labs along with private industry are working with communities and regulators to roll out TE projects. Standards and models from groups like NIST, IEEE PES, SEPA are offering guidance for industry policy, regulation, and adoption of TE tools and methods.

10. What are some valuable resources?

Future link:

Link to GWAC Website long-format FAQ which has further links to relevant resources. Such as: IEEE PES, NIST, GMLC, SEPA