Webinar: DER Communication and Data Management: From Interoperability to Impacts	
Question	**Final Answer**
How important will DER distribution visibility, state and topology estimation be for DER aggregation to fulfill its potential for VPP aggregation?	There are many factors that must come together for DER to reach their potential. Visibility, state, and topology (real/estimate) are all important for normal operations, aggregated operations, or as part of a VPP. Adopting standards for what visibility, state, and topology information are "required" versus "nice to have" for all stakeholders would be a good first step to improve DER performance, overcome M&V challenges, and effectively evaluate economics opportunities.
RA historical practice appears to be a primary challenge for seeing the value of DER. What is your recommendation of how we should perform RA going forward?	ESIG has done a lot of work on RA and I will not attempt to succinctly capture those points here. However, I think the DER and RA asyncronization is a function of both the historical RA framework and the historical DER programs. Our RA analysis can do a better job of caputing the functionality of DER and future DER programs can do a better job aligning with operational frameworks (and therefore our modeling of them). Specifically, I am thinking of programs that avoid the customer fatigue challenge altogether and arm operators with flexible tools that can be used on a daily basis, even if they aren't used on a daily basis.
Incentivizing load flexibility is critical, but we are making only spotty progress in accessing this flexibility. What do you see as the barriers?	The biggest barrier to load flexibility is the customer. Both their natural behavior and their interest in utility programs. With respect to behavior, the natural daily cycle of a homeowner/commercial business for electricity can be somewhat rigid, with little flexibility to maintain "comfort" and convenience. With respect to interest, DER participation models can be complex and opt-in frameworks make recruiting participation difficult.
Can you comment on the impact of resilience of communication used for demand response control and how to plan for comms outages.	The impact of the resilience of communication, while vital in some circumstances, is highly dependent on the use case. Devices should be configured to operate in the absence of communications in an acceptable mode for the given grid conditions. There can also be layers of demand response built into the system where the devices are both behind the meter and in the grid to provide two possibilities of enticing demand to respond through two different communication networks (presuming consumer devices over the Internet and grid devices over utility SCADA, for example). The plans for communication outages should be developpped in the context of how we have historically operate the distribution system with minimal insight into real-time grid conditions.

Can you talk about how Cyber attack surface impact as per IEEE 1547 protocol (DNP3, Modbus, IEEE 2030.5)	IEEE 1547.3 covers this topic in depth. The cyber attach surface may increase due to a greater number of devices, but the security approach is well-defined and applied successfully throughout the industry.
How would you suggest a city of 100,000 begin to think of executing a DER coming from private sector utility management?	Performance-based contract or purchased power agreements can be used to address the needs of the city, whether those are peak management, reliability, resilience, or other objectives. This sort of "energy as a service" can begin with a clear definition of the desired outcome.
buildings are flexibility services providers, would it be useful to have within the "asset object" the thermal performance to decide load shifting strategies?	The model shown and discussed in the webinar is only for the electrical parameters, the scope of IEC. The thermal flexibility of buildings should be available to electric grid operators in the form of electricity impacts. There are large opportunities for thermal end use flexibility aligned with the system stress conditions. For example, summer stress conditions may be a good opportunity for a water heater demand response. These are often implemented now by requesting a demand reduction and letting the building management systems decide what equipment to use (A/C, heating, lighting, etc.). The thermal performance is reflected in the electrical demand to modify the interior temperature at whatever interval is needed to maintain the desired set point.
are all standards available for DER or are some standards still missing? If missing, which ones and who is responsible for creating those solutions?	There are always standards under development, revision, and consideration. However, there are plenty of standards available to do just about anything. While some may not be originally intended to meet a given use case, they can be adapted to do so. For example, IEEE 2030.5 has a fairly clunky mechanism for aggregations, but it works if you do some careful program management. We have called out a need for a data "standard" on EV interconnection applications, similar to what was done for solar via Orange Button in the past. Similarly, there's a need for clarity on the UL standards for automated load management so utilities can verify that software defined systems can limit loads. Both of these are discussed in the forthcoming ESIG whitepaper on EVs/Distribution Planning. I don't see these as holding leading utilities back yet. Folks can always make *an existing standard* work if they're trying to be innovative.

Should we be discussing DER, as it relates to EV charging infrastructure versus all others, differently?	I don't think it's helpful to think about EV charging differently than other DER from an operations/data perspective. Such an approach would lock us into that world of Wunderkammer (cabinet of curiosities) that I discussed in the webinar. We already have some of that with metering and distribution automation using different data standards and therefore different softwares in many utilities. Taking the time to get a cohesive data approach defined upfront will save re-work and avoid data siloes in the long run.