G-PST/ESIG Webinar Series: Advances in the Use of Probabilistic Resource Adequacy Methods	
Question	**Answer**
Can you clarify why the simulation start date impacts RA results in the Western RA case study?	Size of storage needed at start of sims to meet all potential future years
LoLE is the common reliability standard in Europe. How do rate this, knowing its sensitivity on the way you can specify depths and lengths of shortfalls?	The question of which metrics to use to measure reliability, as well as the criteria we should set those against, are being discussed in a few ongoing efforts. We (EPRI) will shortly be publishing a document providing recommendations, and there is an ongoing ESIG Task Force on the topic also. In both cases, the general trend seems to be to adding additional metrics to better capture the different issues - as you say depths and lengths of shortfalls as well as frequency. Expected unserved energy is a potential answer to some of this, and we recommend moving to multi-metric processes. Setting the right criteria for new metrics will be a challenge also, and those charged with identifying metrics and setting criteria should examine different options themselves so that they understand implications for their system. In out studies, we saw how, for the same level of reliability implied by LOLE across the systems, different levels of reliability are observed when examining other metrics. As such, careful consideration of additional metrics is recommended to ensure you capture the relevant issues for your system
FOR - Temperature graph: Why is the FOR the same at 3 different temperatures? Not clear why climate change would alter the FOR-Temperature relationship	The graph here is not related to climate change - thanks for allowing me to clarify. What this shows is the assumed outage rate-temperature relationship - the original curve is based on work carried out by S. Murphy et al and is based on data for PJM. As we did not have similar data for ERCOT when carrying out the study (we do now), we decided to shirt the outage rate such that outages would increase at higher (but still cold) temperatures in ERCOT - as ERCOT is further south and has milder weather on average, power plants there have not been as weatherized as in PJM, and so we wanted to reflect that. We used two sensitivities (5 and 10 degrees) and benchmarked against performance during Elliott and Uri to determine outage rates for the studies.

What do you think or how to incorpate uncertainty (e.g climate change uncertainty) into the risk metric like LOLE or EUE ?	We suggest scenario analysis for the broader systemic uncertainties such as climate change. As the various climate models have different projections of future climate, we would suggest running analysis based on each separately (e.g. each SSP model) and then examining results across the different cases. We have examined how different climate models can be used to identify risk screening periods in some work recently where we looked at various future climate projects, how those impact load and generator availability and then identified the periods where risk would be highest. However it is important to understand which of the climate projections were used for each scenario.
Why does the Min LOLEv case have higher LOLE than the first serve case?	In this case, the objective function is to use the storage to minimize number of events. As such, rather than emptying storage as soon as there is s shortfall, the optimization holds it for when it can be most useful - for example, if storage had 100MWh in store at the start of a period, and there was shortfalls (before considering storage) of 120 MWh and 100 MWh in two respective hours, it would choose to save the storage for the second hour in the Min LOLEv case, resulting in only one hour of lost load, and empty in the first hour for the first serve case, but still have 2 hours. the EUE would be the same, but LOLEv would not.
Could you ID the ~3 most important parameters to get right? For example, is it more important to get the foresight window right or gas supply risk? or others...	Very good question - there is no general answer to this as it depends on the system, nature of risk in the system and the metrics/tools used. However, we are developing a 'materiality index' that aims to, based on the specific details of the system (resource mix, load characteristics, neighboring systems, etc.), provide a guide for the types of issues one should focus most on. The 'Level I/II/III' rubric can then be used to identify which risks should be focused on.
In addition to the nationwide RA risk map shown, any insights into RA risk in Hawaii and Puerto Rico?	The figure is from the NERC studies, and NERC are responsible only for the states and provinces shown. Hawaii do have RA studies themselves (see Hawaii Integrated Grid Planning efforts).
What capacity accreditation level are you assuming for solar in 2050? What assumptions are you making regarding to the storage coupled to solar?	We have a variety of studies, but none were for 2050 here. IN each study we have sued different methods, and examine different methods for coupling storage and solar. For resource adequacy, one should calculate capacity accreditation level directly, and not make assumptions - this level can then be used in capacity expansion studies, which we do not cover here. We have ongoing R&D on capacity accreditation methods, and in previous work did show that the operational assumptions for storage coupled with solar can impact on results significantly
For the wecc case study, you note starting the storage simulation in June versus January , but for what time period of operation?	The study is for one full year. We optimize over anything from 1 day to 1 year to try to represent real world operations, with 1 week being the default. Analysts are encouraged to examine different options there.

Did you plan to use AI models for better demand prediction ? and did you plan to take into the impact of datacenters in energy demand forecast?	It is not clear which study this refers to - we have various studies and tools used. We do think AI models, including ML models long used for operational forecasting, can provide a good basis for long term forecasting. We examined data center flexibility in the Texas study, and at EPRI we have research ongoing about how to incorporate data centers into demand forecasting (EPRI Load Forecasting Initiative)