

Why Is Electricity Resilience So Hard?

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Everyone keeps an eye on the weather. And as opposed to ancient times (or even a few decades ago), there are a lot more ways to keep our eyes on it, such as the Weather Channel and a constant bombardment of promotion from our local TV station about their variation of "storm central".

It is harder to keep an eye on climate change, because it is so disconcertingly incremental. Yet as entities like NASA, the National Academy of Sciences and the Department of Defense have concluded, changes in global and local climate will mean changes in our weather, as well as other impacts like rising temperatures and sea levels.

What does that mean to the electric utility industry? After all, the utility industry has always dealt with major storms and extreme weather events. Utilities have in general done a good job with this, and utility field crews have been like a band of brothers as they have rendered aid to each other when it was needed. But no one likes a weather-caused electricity outage, and there are all sorts of dramatic and dangerous scenarios that can unfold, and are predicted to do so more frequently in the future.

So if more extreme weather events are going to occur, should the utility industry be working to harden its system so that it is more resistant to these events and more resilient when they happen? Well, yes...but as with many challenges there is not only one answer.

If grid hardening is one response to a changing climate, then grid smartening is another one - and one that may not be getting the attention or credit that it deserves. Smart grid technologies and deployments are right out of central casting when it comes to resilience.

Microgrids have quickly become a hot topic in part because of the idea of "islanding", meaning that a microgrid is able to detach from the grid and essentially take care of itself and ride out an extreme weather event. When that kind of islanding occurs in coordination with the overall grid, it can result in greater overall reliability and resiliency. After all, if you were the person in charge of running the system during such events, wouldn't you like having real-time on-demand resources that can be used or not used as you try to respond to outages, re-route power delivery, etc.? Microgrids can help with how the grid is optimally managed around the clock, but in times of trouble, they help it be more resilient.

Storage is a natural contributor to resiliency in a vein similar to microgrids. It creates new options and choices for both electricity customers and providers, including in how they prepare for and manage their operations during extreme weather events.

When you think about it, distributed energy resources (DER) in general increase resiliency based on the age-old strategy of not putting all your eggs in one basket. By distributing resources around an electricity system, adverse impacts on one part of that system can result in less of an impact on it overall. Things like rooftop and community/garden solar help create a more reliable and resilient system, especially when managed by the new distribution management technologies and platforms that are available today.

Let's not forget demand response. Increased temperatures resulting from climate change will likely drive air conditioning use, which is a major contributor to peak demand. Demand response's ability to help with this is now well proven. But it is time to think more broadly about demand response. DR at its core represents a form of dynamic electricity management, starting at the building-by-building level but adding up to an electricity system that can be managed more dynamically and restored more quickly and effectively.

Unfortunately, I don't think there is enough focus on the resiliency value of grid modernization and DER, including on the customer side of the meter. A couple of years ago I was hired to facilitate a workshop that only involved utility executives and managers in charge of distribution systems. It was held in the Northeast, with memories of Superstorm Sandy fresh in everyone's mind. At one point on the second day, I asked the 70-80 attendees to raise their hand if they were part of their utility's internal smart grid team, committee or working group. Only a few hands went up. Things are changing fast, and it may be that many more hands would go up if the question were asked today, but I am not so sure.

Utilities should not be the only ones who think of smart grid as an element of grid resilience; it is just as important if not more so that state policymakers do so as well. They are the ones who make policy on the type of non-wire, "non-hard" options I have mentioned and that can help or hinder their development and deployment. They are also the ones that to a large extent have control of the purse strings when it comes to utility distribution-level infrastructure.

Resilience should not be the only factor in decisions made about the electricity system. But it should not be ignored either, and it should be considered as an additional benefit of smart grid and DERs when decisions about their deployment are made.

Grid hardening is important for creating a more reliable, resilient system - but so is grid smartening. Think about it.