GRID:

DOE, Stanford find severe weather increasing duration of power outages

Umair Irfan, E&E reporter

Published: Tuesday, August 25, 2015

Closing in on the 10th anniversary of Hurricane Katrina this week, the memories of darkened skylines along the Gulf Coast are bringing back discussions on grid reliability.

Policymakers are asking what lessons were learned in the years since the storm and the other hurricanes that followed, like Ike, Irene and Gustav. In 2013, the Department of Energy published a study that definitively linked climate change to disruptions in energy infrastructure (***ClimateWire***, July 12, 2013).

Earlier this year, the department released its first installment of the Quadrennial Energy Review, a comprehensive assessment of the nation's energy systems. The 348-page report focused on risks to energy transmission and distribution, finding that extreme weather and rising temperatures pose grave risks to everything from power lines to pipelines (***ClimateWire***, April 22).

Now, researchers from Lawrence Berkeley National Laboratory and Stanford University have found that over a period of 13 years, the frequency of power outages has remained relatively constant, but the duration of disruptions is rising in large part due to extreme weather.

"The impetus was really to study what are the factors that are influencing the long-term reliability of the U.S. power system," said lead author Peter Larsen, a research scientist at Lawrence Berkeley, who presented his findings in a report released yesterday.

Larsen and his collaborators conducted a statistical analysis of utility performance between 2000 and 2013. These utilities serve 70 percent of U.S. electricity customers. The researchers then compared power outages and disruptions to possible explanations like lightning strikes, storms, flooding, wind speed and other proxies for extreme weather.

"One big finding is that the trends and duration of power interruptions point to a 5 to 10 percent increase in total minutes customers are without power," Larsen said.

'It's consistent with what you would see with climate change'

The report also revealed that running transmission lines underground helped utilities weather storms better.

However, the report didn't find a link between infrastructure spending and reliability. Larsen explained that this is likely because the analysis couldn't tease out the difference between proactive and reactive power companies.

A reactive power company spends money on transmission lines and substations after they've already been knocked down, while proactive companies anticipate risks and spend money hardening their infrastructure before a disaster strikes, thereby increasing reliability. Averaged out, the distinction is lost.

Larsen noted that past studies of grid reliability often excluded extreme weather events as statistical outliers, but including them in this assessment is what revealed the trend of rising downtime even as the number of power outages remained level.

"What it suggests to me is not that utilities are failing to maintain [the grid] over time, but something is happening that is making these events more severe," said James Sweeney, a professor of management science and engineering at Stanford University, who co-authored the report. "To me, it's consistent with what you would see with climate change."

Sweeney cautioned that this particular study did not assess climate change as a variable and didn't include any climate modeling in the analysis, but noted that the findings do align with many forecasts that anticipate more severe extreme weather in a warming world.

"I would see it as a wake-up call to some of the utilities or bodies that are regulating utilities," Sweeney said. "We may see other severe events over time. If we know that, then we should be putting infrastructure in place for dealing with the issue."

The researchers said they now want to drill down further into the numbers and analyze regional variations that could prove more useful for regulators. They also called for more consistent and standardized performance reporting from electric utilities.

Twitter: **@umairfan** | Email: **uirfan@eenews.net**