

Ida's damage could spur reckoning over costs of grid defense

By Peter Behr

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A year before Hurricane Ida blasted New Orleans last month, another massive Gulf Coast storm — Laura — delivered a brutal lesson of what happens when 150-mph winds hit 50-year-old utility poles not engineered for such assaults.

Laura, a Category 4 hurricane, came ashore Aug. 27 last year at Lake Charles, La., flattening nearly 1 in 3 transmission structures designed in the 1960s to survive no more than 110-mph sustained winds. The city of Lake Charles, about 200 miles west of New Orleans, was without power for 13 days.

Newer transmission towers, built to a 1997 standard to survive 140-mph winds, were largely unaffected by Laura, an executive with New Orleans-based Entergy Corp. told state energy regulators earlier this year.

Ida, which struck New Orleans on Aug. 29, also made landfall as a Category 4 storm and caused lengthy power outages. Twenty percent of the blacked-out system had been restored as of last week by an army of line crews from 41 states, but Entergy warns, “customers in the hardest-hit areas in Louisiana should expect extended power outages lasting for weeks.”

The devastation has given urgency to Energy Department-backed efforts to rethink how to account for the severe human and economic toll of blackouts in the face of a “new normal” of accelerating extreme weather bouts. Researchers say they hope to offer electric utilities and their regulators credible tools for comparing the costs and benefits of actions to toughen vulnerable transmission and distribution infrastructure.

“We’re not talking about little investments here,” said Peter Larsen, a staff scientist at DOE's Lawrence Berkeley National Laboratory and leader of the lab's Electricity Markets and Policy Department. “These are very capital-intensive decisions. We’re thinking about who pays.”

DOE researchers and power company officials have launched a project based at LBNL to create more accurate estimates of losses from storm-caused blackouts that last weeks, not a few days. The damage estimates are central to calculations of how much to spend on grid hardening, according to Larsen.

LBNL, joined by the Edison Electric Institute industry group and several U.S. power providers, hopes to form a public-private partnership this fall to upgrade the lab’s computer program that utilities use to justify benefits of grid investments to regulators, Larsen said.

The lab’s Interruption Cost Estimate Calculator (ICE) model doesn’t yet consider outages lasting longer than 16 hours. “Beyond 24 hours, you start to get economic impacts. You start to see

ripple effects” on public health and safety, and business operations, Larsen said. The upgrade, based on utilities’ storm experiences, will equip the calculator to look at long-term impacts.

“The ICE calculator, and tools like it, will play a critical role as state regulators, policymakers, and electric companies work to better understand the financial impacts of power outages and assess the benefits of resilience investments,” said Adam Benshoff, EEI's vice president for regulatory affairs.

How much defense is enough?

Entergy’s policy tries to balance upgrading grid defense against increasing threats while keeping electricity rate increases in check, said Michelle Bourg, Entergy's vice president for transmission asset management, in April testimony before the Louisiana Public Service Commission.

“All of this is to say that the catastrophic damages caused by Hurricane Laura were not due to any disregard on the part of the company of the importance of storm hardening and upgrading its transmission system, but rather due to the unprecedented strength and force of Hurricane Laura,” she said.

Last year produced 30 named storms, including six major hurricanes. Laura was the strongest storm to assault Louisiana since 1856, and its damage was like a tornado's, but over a much wider path, Bourg said.

“The company evaluates hardening strategies from a customer perspective, weighing the benefits of fewer and shorter outages against the increased costs of hardening the system, which our customers ultimately must pay for,” Bourg said.

Entergy spent close to \$1 billion to harden its transmission system in the Lake Charles area in the 13 years before Laura struck, adjusting for inflation. It wasn’t enough. Total costs from Hurricane Laura’s single strike are estimated at \$491 million.

Since the beginning of 2016, Entergy says, it has plowed \$12.6 billion to harden transmission and distribution lines in its five-state region. As Ida tragically proved, that wasn’t enough, either.

Entergy has not released data on the ages of its network infrastructure taken down by Hurricane Ida, which destroyed or damaged over 30,000 poles and about 6,000 transformers in Louisiana and Mississippi, cutting off power to more than 900,000 customers, as of last week’s damage report. Just over 500 damaged structures were on transmission lines; the rest were on distribution networks.

But old transmission towers were still in the storm's path, grandfathered in despite having been built to the less stringent standard, said Portland, Ore.-based analyst Robert McCullough, whose

firm, McCullough Research, issued a [report](#) on Ida's impact last week highlighting Bourg's testimony.

"Many utilities wait until older equipment is destroyed," or reaches its predetermined lifetime — 30 years for major transmission infrastructure along the Gulf Coast, McCullough said.

That's partly because it has often been easier for utilities to get regulators to approve cost recovery for storm damaged equipment than to pay to replace poles and lines ahead of schedule, he said. But that's not what's best for utilities or their customers, he added.

"What is the expected lifetime of a wood [utility] pole along the Gulf Coast of the United States? It is not 30 years," McCullough said.

Entergy spokesperson Neal Kirby, responding to an E&E News query, said the threat of increasingly violent weather is recognized. "While ensuring the resilience of our infrastructure has always been a primary focus, we recognize that we must accelerate our efforts in light of increasingly frequent and severe weather events," he said. "We will continue to refine our understanding of where the specific risks attributable to climate change are expected to become more severe in the years and decades ahead and focus our hardening efforts accordingly." Upgrading to a 150 mph hurricane survival standard is beginning in extreme coastal hurricane zones, he added.

Nora Brownell, a former member of the Federal Energy Regulatory Commission, said utilities must report better storm response information and use that in planning expansion and improvements.

Brownell, who was brought in as chair of PG&E Corp. in 2019 during the bankruptcy reorganization of the company, which owns California utility Pacific Gas and Electric Co., resigned with other board members when PG&E came out of bankruptcy last year. But Brownell said she has seen firsthand the vital importance of good data about utility system vulnerabilities — wildfires, in PG&E's case.

As Entergy rebuilds its system, "there should be a forensic analysis by the Energy Department as to what happened and what can be learned" from Ida's impact, Brownell said in an interview with E&E News.

There is a great opportunity to "build for a future that we know will be dramatically different than what the old networks were built for," she said.

"If I were a regulator, I wouldn't approve anything [for grid hardening] that didn't use advanced technologies for operational efficiency and transparency, and I wouldn't approve anything without an independent verification of the modeling for future conditions," Brownell added.

Contentious regulation

The way regulatory cases handle utilities' costs to future-proof their systems needs reevaluation in a world of growing climate threats, Larsen and colleagues say.

LBNL's case for analysis of long-range outage impacts is backed by a [study](#) it did, issued in November, of recoveries from recent hurricanes and storms in five states — California, Florida, Texas, New York, Maryland and New Hampshire — following extreme storms.

The report concluded that regulators and utilities had far to go in pinning down the costs and benefits of hardening against extreme storms.

“You have a tension between consumer advocates who want to make sure power is reliable but not expensive and utilities facing threats,” Larsen said.

Critics will suspect that utilities may be padding investment budgets to increase financial returns.

“There has to be some compromise about some of these investments,” Larsen said.

Judsen Bruzgul, senior director for climate adaptation and resilience at ICF, a Fairfax, Va.-based strategic advisory firm that is working with DOE and utilities on planning for extreme climate threats, said the industry and its regulators must look ahead.

“From what we have seen, the large majority of the industry is relying on historical information to think about the investments they need to make in the future and the risks that they might face. With climate change, that historical, backward-looking approach is going to fall short against the risks they do need to plan for,” he said in an interview with E&E News earlier this year.

“We do need to improve integration of the forward-looking information and science that's available to think about how temperature, sea-level rise, storms and other risks to energy systems are projected to change and already changing,” Bruzgul added. “Planning processes need to adapt to think more probabilistically about the future, rather than wait for the science to give them the one answer.”

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