

## Ten years after the Northeast Blackout: How secure is our grid?

Written by Gal Luft

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Ten years ago, every city between Detroit and Ottawa, including New York, turned dark in what became known as the Northeast blackout of 2003, the most severe power outage to ever occur in the industrialized world. For the next four days the lives of 50 million Americans and Canadians were turned upside down, and, due to the blackout, the lives of eleven ended.

Airports, ground transportation systems, banks and stock markets were shut down; cellular communication and cable TV services were disrupted; and millions were forced to boil their water and, absent air conditioning, swelter in a 90 degree summer heat.

The immediate official response of US authorities was taken out of a South Park episode: blame Canada. But as time progressed the true culprit was revealed. A sagging power line in Ohio touched an untrimmed tree branch triggering a cascading grid failure across the Northeast U.S. and large parts of Ontario. Hitting America's economic hub, the outage exposed the fragility of our electricity grid. America's electricity system is made of hubs and spokes with large centralized power generating facilities connected to high voltage transmission lines traversing thousands of miles and crossing state and national borders. The cumulative length of those lines surpasses the distance to the moon. If a tree in Ohio was able to wreak havoc in our economy how difficult would it be for a competent terrorist to find an exploitable vulnerability and do the same?

Much has been done over the past decade to understand the vulnerabilities of our grid and reduce the chance of a repeat occurrence. Public utilities today face stronger and more enforceable reliability standards, demand responsive pricing that incentivizes consumers to adjust their electricity use during peak hours is being introduced, and many utilities are experimenting and deploying smart technologies that can diagnose and resolve problems as they arise.

But despite all of those upgrades the U.S. electricity system is not less vulnerable than it was ten years ago. Recent years have presented a variety of threats, from extreme natural disasters – as was the case during the Japanese Tsunami and Hurricane Sandy – to cyber-attacks, solar storms and high altitude electromagnetic pulse (EMP) attacks. Paradoxically, the more intelligent our grid becomes and the more reliant it is on internet communications the more room there is for malevolent cyber-attacks.

The reality is that no power system is immune from failure. We must therefore seek ways to ensure that should the system fail us again, the outcome would be merely bad, not catastrophic. Yet, our national discussion since the 2003 outage focused on how to bolster the centralized system instead of focusing on how to encourage more businesses and households to better insulate themselves from system failure or opt out of the grid altogether by adopting standby generators, uninterruptible power source (UPS) devices, backup storage batteries, fuel cells and other means of off-grid generation. Such business continuity capabilities should be our first line of defense. But in 2003 they were rare. As a result, ATMs ceased to discharge cash, gasoline pumps became useless, and in high-end commercial buildings employees were trapped in their offices and elevators when the electronic doors refused to open.

The lesson from 2003 is that real energy security begins at home, workplace, local gas station,

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grocery, bank and other businesses we frequent. We must begin to inquire with those service providers and in our own workplace how prepared our surroundings are for power outages and for how long our vendors can island themselves to provide critical services.

Such a focus also makes good economics. According to Allianz insurance company, power outages sum up to an annual economic loss in the U.S. of \$104-\$164 billion - a hidden indirect expense of roughly \$1,000 per household incurred through increased insurance premiums across all the sectors of our economy. The lion's share of this cost are not the highly visible blackouts - The 2003 blackout caused an estimated damage of \$6 billion - but the more local and short blackouts and seemingly harmless dips in voltage that never make headlines. If businesses invested more in risk mitigation instead of insurance premiums, consumers would not only be more energy secure but they would also save money.

Americans deserve a modern and robust centralized electricity system, but to paraphrase George Clemenceau, electricity is too important to be left entirely to the utilities. We need to know that when the grid fails on us – and it will – at the very least we can exit the building.

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