

Localized Generation Can Alleviate Texas' Extreme Weather Problems

By Michael Longo

In mid-February, two severe winter storms crippled Texas' utility infrastructure and left 4.3 million people without power. Despite partisan efforts to blame a single resource (Democrats – it was the fossil plants! Republicans – it was the frozen wind turbines!), this catastrophe happened because of Texas' centralized energy infrastructure. A more localized energy grid would have lessened the impact of this disaster.

Texas' power grid regulator – known as ERCOT – broke away from federal oversight in 1970 to manage the state's power needs. To this day, there are three major grids in the US – one for the Eastern States, one for the Western States, and ERCOT for Texas. ERCOT personifies Texas' independent spirit by keeping the state's electrical infrastructure – from power plants to distribution lines – in-state and not sharing power with its neighbors. This arrangement makes Texas a self-sufficient energy island by balancing competitive prices and grid reliability (no blackouts).

Despite its independent roots, ERCOT relies on a centralized infrastructure where less than 100 power plants provide almost all of Texas' base load power (solar and wind are not considered 'base load' because the sun doesn't always shine and the wind doesn't always blow). This typically stable structure created the environment where February's cold snap left millions of Texans without power. To avoid future energy emergencies, ERCOT must empower small, localized generating resources – why should small communities suffer from failures at the state level? See the irony with ERCOT?

Relying on just a few power plants magnifies the consequences of a trivial failure. For example, during the most recent Texas freeze, the South Texas Project – a 2,708 MW nuclear power plant in Southeast Texas – lost 1,354 MW of generating capacity because its supply water froze and damaged two pumps. That 1,354 MW of capacity would have been enough to power over 1.1 million average American households.

In addition to faulty equipment, large, centralized power plants are attractive targets for cyber terrorists. There is a growing awareness of this threat as [Congress has established committees to protect the nation's electricity infrastructure from these bad actors](#). ERCOT's structure allows nefarious hackers to maximize destruction by identifying the right vulnerability. What if that vulnerability exists at the 2,736 MW W.A. Parish Generating Station outside of Houston or the 2,051 MW Sabine Power Plant that provides power to the Port Arthur Industrial Corridor? One hack would leave millions of Texans with no access to power. With more localized energy resources, cyber terrorists would need to hack dozens of different systems to inflict the same harm.

While centralization is common for grid operators, there are advantages associated with small, localized power plants. Localized energy resources, unlike large power plants, are located closer to end-users. That means more flexibility to respond to local supply/demand conditions and less losses associated with the transmission of electrons (losses occur as electricity moves through power lines). Local resources create a more efficient electricity grid.

As with most utilities, adding localized generation capacity to ERCOT is onerous for businesses and municipalities. According to ERCOT, 'utility scale distributed generation' (all localized generating resources, excluding residential rooftop solar) makes up just under 990 MW or about 1.2% of the state's installed capacity.¹ Regulatory red tape discourages these projects and increases the likelihood of another energy catastrophe in Texas.

Alternatively, imagine if individual communities subject to an ERCOT-imposed blackout had the ability to switch to a local power source. In addition to avoiding blackouts, the community could avoid buying power from ERCOT at prices that reached \$9,000 per megawatt hour, up from an average of \$21.18 in 2020! Those prices are the real-life result of supply and demand on ERCOT's grid when supply is unexpectedly downed by extreme weather.

In the wake of its February issues, Texas Gov. Abbott declared ERCOT reform as an emergency item in the state's next legislative session. Wouldn't it be great if that reform exemplified the spirit of Texas individualism?

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¹ http://www.ercot.com/content/wcm/lists/200196/DG_and_DR_in_ERCOT_FINAL2.pdf