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Storage supports bridge to renewable energy

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The industry's transition will make production cleaner, and electric storage can help us keep the lights on in Texas

Remember the transformation cellphones made to the communications industry? For the telecom industry — and for all of us customers — life before cellphones was entirely different from life after. Electric storage technology, that is, batteries, could have a comparable effect on the electric industry.

That's because electricity storage is a bridge technology that can take Texas from a system of large, centralized, fossil fuel and renewable power plants, to a future of cleaner, decentralized renewable energy. And it is a crucial bridge, as Texas attempts to keep the lights on amid this technology transition.

The Electric Reliability Council of Texas, or ERCOT, manages the flow of electric wholesale power to 90% of consumers in the state. The ERCOT market is undergoing a challenging transition from large centralized and controllable power plants to ever-increasing levels of variable renewable energy. Just like any new technology, there are some downsides.

The increase in renewable energy and the premature shutdown of traditional power plants is certainly resulting in less air pollution, yet at the same time creating grid reliability concerns. This transition has caused a very tight supply-demand situation in ERCOT where anything unexpected, such as an extended cold snap, extremely hot weather or excessive problems at centralized power plants, could result in rolling outages. These controlled outages are ERCOT's way of keeping the grid in balance in an emergency and avoiding a complete systemwide blackout.

Electric energy storage can address this reliability concern, allowing the integration of more renewable energy. Storage provides another tool for ERCOT and utilities to balance energy flows, especially during peak use periods. A device that stores energy during low use times, and then discharges electricity during peak use, will make the grid more reliable, economical and cleaner.

Some background on electricity generation and delivery will help explain why storage is the next best bridge technology.

Electricity is one of the few commodities or services that doesn't depend on storage to sell and deliver its product to consumers. Food, oil, natural gas, beverages, clothes, gasoline and most other goods are shipped from the manufacturer to the consumer and stored at various points along the way.

In contrast, electric energy is produced at the same time consumers demand it. When you flip on a light switch, a generator must immediately produce additional electricity flowing into the grid to maintain system reliability, so the lights stay on for all of us. Over the last 100 years, the electric industry has built a complex network of generators, transformers and wires to deliver this power on demand, an amazing engineering accomplishment by any measure. And, we rely on it 24/7, 365 days a year, to support our very quality of life.

To clarify, electricity networks are strong and delicate at the same time. Strong because there are many generators, transmission lines, substations and distribution systems creating defense in depth (many redundant systems) and width (many wires pathways to serve customers). At the same time, maintaining stable voltage and frequency across the grid is a delicate balance of electric energy supply and demand using computer and human operating systems.

Since renewable energy is subsidized by the government and the cost to build has dropped dramatically over the last decade, the competitive market prices in ERCOT have become very low during normal grid operation. This benefits consumers in the short run but is also forcing older plants out of service sooner than expected. Therefore, we are facing a transition of several years when electricity production becomes cleaner, but the risk of power outages increases. To help correct this imbalance, storage devices can be installed within the existing wires system in a relatively short time frame, helping balance power supply and demand, and reducing the risk of system outages.

Evidently others agree with me. ERCOT reported at an April 23 meeting that requests for interconnection of new storage systems to the grid had grown to 500 megawatts in 2020 (equivalent to a medium-sized traditional power plant), increasing by another 2,500 megawatts in 2021, and adding another 3,500 megawatts of storage in 2022.

Increasingly efficient and economical storage technologies have the potential to substantially change the way we produce and deliver electricity in the future. These technologies could eliminate the need to build new central power plants and delay the need for new investment in power lines and electricity distribution systems to consumers. Electricity storage has the potential to change our existing electric industry business, regulatory and financial models essential to attract investors to build out this infrastructure.

There is no question storage is coming to the ERCOT market. We must embrace its use as a bridge to a more reliable, affordable and cleaner electricity demanded by consumers.

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