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## Heat Wave Again Tests Ercot Margins as Shortfall of Gas-Fired Baseload Looms

The Texas power market — long celebrated for its deregulated, market-driven structure — flirted with crisis again last week as available gas and coal plants ran full steam to meet demand from an intense heat wave. And within a few years, critics say, gas-fired capacity could prove inadequate to meet similar weather events despite the state being awash in gas.

“No one is building baseload gas plants,” Charles McConnell, executive director for the Center for Carbon Management in Energy at the University of Houston, told Energy Intelligence. “The market is set up to reward renewable investments and not reward investment in baseload capacity, which is why a once healthy reserve margin of 16% has fallen into the single digits.”

This fall in the reserve capacity to roughly 8% is starting to play out in real time. The Electric Reliability Council of Texas (Ercot) faced its second major heat wave of the summer last week as temperatures topped the triple digits across the Lone Star State. On Friday, peak demand on the system was just over 68,900 megawatts, about 2,900 MW shy of operating capacity — a result possibly dampened by well-publicized calls for customers to cut power use on Thursday and Friday.

“The Ercot market has been working as designed, encouraging generators to make themselves available during tight operating conditions,” the independent system operator for 90% of the state’s power market said in a statement. The prior month’s sizzling heat in Texas pushed the electric grid to within 2,300 MW of operating reserves on Aug. 13 and 15, prompting Ercot to issue level 1 Energy Emergency Alerts (EEA1) for the first time in five years. An EEA1 requests voluntary conservation measures and calls on all available power supplies — including from other grids.

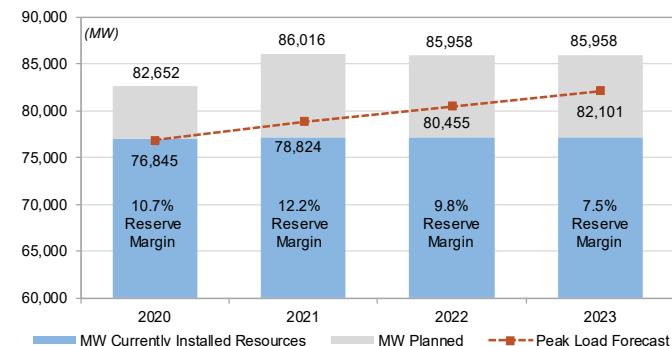
If demand had come within 1,000 MW of operating capacity, it would have prompted a level 3 EEA in which rolling brownouts and blackouts would be instituted. Otherwise, one or two tripped plants could cause the overall grid to fail.

Also noteworthy, demand peaked at 74,531 MW on Aug. 12, more than 5,500 MW above last Friday’s peak. Still, demand last week came uncomfortably close to operating capacity.

It’s key to remember that operating capacity is not the same as installed capacity, which may be unavailable due to

planned and unplanned plant maintenance or simply due to capacity in the stack that’s unable to contribute power when needed most. This is especially true of wind, which represents 22,000 MW of Ercot’s installed capacity but during the heat of the day might contribute 10% of that capacity. This reduces the amount of power available for operating capacity on a hot afternoon, but that same night wind power can flood the system, causing power prices to go negative.

### Ercot Planned Reserve Margins 2020-23



Source: Electric Reliability Council of Texas (Ercot)

Nonetheless, wind generators recover the loss with investment tax credits and other payments that they wouldn’t get unless they “sell” power into the grid. “Anyone running a baseload coal or gas plant can’t compete with that,” McConnell said, adding that the Texas power market is stacked in favor of subsidized renewables.

As a result, baseload power plants are limping in the state — coal plants in particular are being retired (NGW Jan. 719). But the lack of a level playing field also has stymied development of more gas-fired baseload capacity, which the state needs if it is going to meet expected power demand growth of around 2% per year.

The good news for gas plants is the cost of gas in the state is low, and single-cycle plants can turn off and on quickly, McConnell said. “But they’re lousy plants not meant to run continually. The bad news is there has been precious little investment in gas combined-cycle baseload plants of late, and they cannot be replaced by renewable generation,” he said.

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## ERCOT (continued from I)

In his view, this sets up a train wreck. The competitive market in Texas ultimately decides what kind of installed capacity is added and this favors the addition of more cheap wind and soon much more solar capacity. This will send Ercot's installed capacity to seemingly healthy heights. But without the ongoing addition of baseload gas and nuclear plants, reserve capacity will increasingly struggle to meet peak summer demand.

### Growing Pains or Fatal Flaw?

This trend has been somewhat masked by legacy capacity, McConnell said, much of which was built prior to the market's deregulation in 2002. Gas still makes up 51.7% of Ercot's power generation mix; coal, 14.2% and nuclear 5%. Wind has surged to 21.7% and solar is 1.7% but is expected to grow rapidly as costs fall. But the Texas conundrum may be the result of growing pains rather than a fatal flaw in its market structure, Warren Lasher, Ercot's senior director of System Planning, told Energy Intelligence.

The deregulated market structure that has evolved over the last 17 years in the Lone Star State is "very open to new technologies and very competitive," he said. Ercot didn't create this hyper-competitive market and doesn't dictate the capacity breakdown within its portfolio. The system established by the Texas Legislature 17 years ago is designed to ensure the market encourages the growth of the most efficient and least expensive generation, he said. To that end, plants are not subsidized to remain in the stack on standby; instead, all capacity competes on price.

The idea is that plants sidelined as prices drop can make up the loss when demand is high and prices rise. In cases of se-

vere system congestion and a falling reserve margin, price adders are triggered that can run as high as \$9,000/MW. The adders were increased by the state Public Utility Commission (PUC) last spring in a move meant to allow power generators to capture huge price spikes and spur the development of new capacity (NGW Dec. 17'18).

The question is what kind of capacity additions the adders will spur and what their impact will be, Lasher said. "Over time, new technologies take hold in Ercot faster than in other markets," he said, adding that this happened even before the state deregulated the power market. For instance, in the 1990s, combined-cycle gas plants began displacing older gas steam units, most of which were retired by 2010. "Soon after, wind generation became more competitive," he said, especially once the Legislature in 2005 passed the \$7 billion Competitive Renewable Energy Zone initiative that built a transmission system to harness the state's wind potential.

While Ercot and the PUC are focused on making sure the state's competitive system addresses reliability, it may not be so clear today what kind of reliable system might evolve, Lasher said. It might be a system dominated by wind and solar working in tandem and backed up by battery storage. It might involve a massive rise in distributive generation. But in the end, competition will steer it where it needs to go. But McConnell is adamant that price competition alone can't be relied on — something that will become increasingly obvious as "we eat through the fat of the land."

"In a nutshell, the market needs to be able to reward those who invest in baseload," he said. ■

Tom Haywood, Houston