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Natural Gas Onsite Generation Accelerates Time to Power, Provides Grid Flexibility, Enchanted Rock Says

The iMasons Legacy Podcast
Listen to the Episode:
Natural Gas Onsite Generation Accelerates Time to Power, Provides Grid Flexibility

Left to right: Santiago Suinaga, Chief Executive Officer, Infrastructure Masons; Pete DiSanto, Executive Vice President of Data Centers, Enchanted Rock.

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Bridging the Power Gap

Electric grid operators plan for extreme conditions. For example, consider a deep winter freeze that spans the Western United States and sends electricity demand soaring as output from solar and wind farms plummets. Grid operators must ensure they have enough power generation capacity from other sources to keep the lights on and contingency plans in place in case they fall short.

Such extreme events are rare, but when they occur, the grid has less available peak power capacity to meet the demand.

"Grid operators need more tools so communities have power when they need it," said Pete DiSanto, Executive Vice President of Data Centers with Enchanted Rock, which has more than 1 gigawatt (GW) of natural gas generation in operation or under construction at more than 370 locations. "But when you ask to connect a 500-megawatt data center load, they go, 'We are already stretched and can't deal with that amount of load for five more years.'"

Grid operators "can't deal" because electric power grids are maxed out – they cannot absorb additional industrial loads and guarantee the lights will stay on during the next extreme event. Supply reserve margins are tight, and transmission capacity is backlogged to interconnect new supplies and large loads,

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One solution to this challenge is to leverage the flexibility of onsite power generation, he noted. For example, Enchanted Rock's "Bridge-to-Grid" program uses onsite natural gas generation to accelerate time to power for large loads like data centers. The generation, configured in a fault-tolerant design, provides around-the-clock power to the site until a grid connection is established and then remains available as backup power for the data center and for the grid during times of system stress.

"Power capacity constraints are a top-tier challenge for data center development," said Santiago Suinaga, Chief Executive Officer of Infrastructure Masons (iMasons). "Many of our members support the development of data centers that require hundreds of megawatts to more than a gigawatt of power capacity, and they are looking for innovative solutions that bridge the power gap to enable the sustainable growth of our industry."

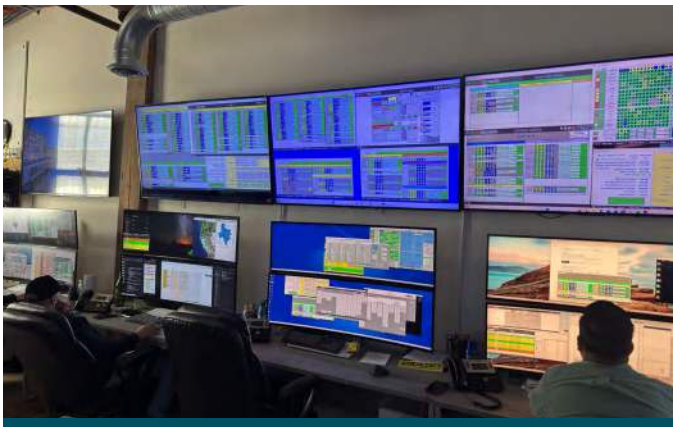

Photo courtesy of Enchanted Rock

"Grid operators need more tools so communities have power when they need it."

— Pete DiSanto,
Executive Vice President of Data Centers,
Enchanted Rock

Photo courtesy of Enchanted Rock

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Leveraging Reserves

The flexibility for data center operators to switch to onsite power generation allows electric grid operators to connect a new data center load to the grid and maintain readiness for extreme conditions, explained Madison Ruta, Senior Director, Microgrid Development, at Enchanted Rock. That's because a data center with reliable onsite power can accept more readily available non-firm, or interruptible, service from the grid.

"We're trying to accelerate that interconnect timeline," Ruta said. "One way we do that is by helping the data center negotiate faster service with the utility if the data center can be flexible and accept non-firm service by filling the gaps with onsite generation."

Left to right: Santiago Suinaga, Chief Executive Officer, Infrastructure Masons; Pete DiSanto, Executive Vice President of Data Centers, Enchanted Rock; Addison Jump, Sr. Manager, Client Relations & Events, Enchanted Rock.

This flexible generation strategy to accelerate time to power for data centers is echoed in the recent "Rethinking Load Growth" study by a team of researchers at Duke University. The study finds that as much as 126 GW of new load could be added to the U.S. electric power grid if the new load can be temporarily curtailed during times of grid stress.

The study homes in on the fact that electric grid operators make "intentional planning decisions to maintain sizeable reserves during infrequent peak demand events." This excess capacity is sufficient "to accommodate significant constant new loads, provided such loads can be safely scaled back during some hours of the year."

Enchanted Rock's natural gas generation provides data centers with the requisite flexibility to scale back their use of the grid when required. This type of flexibility may become the only path to secure grid connections in certain markets, noted DiSanto. For example, proposed legislation in Texas would require any new load that's 75 MW or above to be interruptible.

"You can control your onsite generation, but you have no control over the feed to your site," he explained. "That's one of many examples that are emerging. Large loads can't expect the same treatment they got when they were 50 megawatts as when they are 500 megawatts."

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Growing with the Grid

Most data centers are equipped with onsite backup generators to maintain service availability during electric power grid outages. Enchanted Rock's natural gas generation also provides this emergency backup service, with the same or better performance compared to traditional diesel backup, according to the company.

The Duke University study highlights the opportunity for data center operators with onsite generation to also prevent grid emergencies through active participation with the grid.

"They can offer to the utility, 'Let's work together. I can do some things on my side that will help you,'" DiSanto said.

Enchanted Rock's generators run firm, no-notice pipeline delivered natural gas, which emits fewer pollutants and greenhouse gases than diesel, the traditional fuel source for backup generators, noted Ruta. The cleaner-burning fuel streamlines the air permitting process for continuous operation, which gives Enchanted Rock's generators the ability to bridge the gap while a data center waits for grid integration.

Once a grid connection is established, the generation remains available to actively participate with the grid in addition to providing emergency backup generation for the data center.

Left to right: Pete DiSanto, Executive Vice President of Data Centers, Enchanted Rock; Santiago Suinaga, Chief Executive Officer, Infrastructure Masons.

"To maintain sustainable and responsible growth requires partnerships and relationships with different stakeholders like local utilities and energy companies that show the data center is an asset for the community."

— Santiago Suinaga,
CEO of iMasons

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Growing with the Grid

Photo courtesy of Enchanted Rock

“If the data center comes in and says, ‘Hey, I have flexible generation,’ the utility can continue integrating solar and wind.”

— Madison Ruta,
Sr. Director, Microgrid Development Team,
Enchanted Rock

The ability to provide flexibility to the grid – to use the onsite generators during times of peak demand or grid stress – also allows grid planners to increase grid capacity with solar and wind, which are intermittent, instead of new coal or natural gas power plants, noted Ruta.

“If the data center comes in and says, ‘Hey, I have flexible generation,’ the utility can continue integrating solar and wind. The utility will know that during gaps in renewable production, data centers can switch their load to onsite generation and alleviate strain on the grid,” she explained.

Calls for this type of interaction and partnership with the utilities to solve the power challenge increased among iMasons in the weeks after the “Rethinking Load Growth” study was published, noted Suinaga.

The days are gone when a data center developer could walk into a community and expect a connection to the power grid, no questions asked. To maintain sustainable and responsible growth requires partnerships and relationships with different stakeholders like local utilities and energy companies that show the data center is an asset for the community.

“Enchanted Rock brings a solution to the community that makes the grid more efficient and more reliable,” Suinaga said. “Our industry benefits from this type of innovative approach.”

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