

Bridging the Gap: Data Center Power Supply & Demand

ERM ROUNDTABLE INSIGHTS

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As demand for artificial intelligence and digital services accelerates, one obstacle is rising fast: access to power. In our recent virtual roundtable, leaders from digital infrastructure, utility, and independent generation sectors came together to discuss how to keep pace with explosive data center growth while navigating increasingly constrained energy systems.

Data Infrastructure is Growing—Fast

Data centers are, and will continue to be, valuable utility customers due to their consistent 24/7 demand. Managed well, this steady demand can help lower local energy costs and improve grid utilization. Additionally, the potential for data centers to provide demand response and backup generation provides flexibility to manage seasonal peak power days when dealing with extreme temperatures. Some companies are already building this into larger data center campuses to help provide relief on the power provider.

Their biggest challenge? “Speed to power.” Digital infrastructure demand and AI are growing faster than our ability to connect them to the grid. Data center providers are now building in-house energy teams to drive convergence between the two industries and to address the issue that the pace of demand is outstripping grid development timelines.

Innovative Bridge Strategies

There are several energy bridging solutions for filling power supply gaps needed for continued data center growth. When a data center cannot get a connection fast enough, developers often look to behind the meter (BtM) solutions. If the timing of a full grid connection is under a year or two, temporary generation is typically the answer. However, in some areas, utilities are asking for BtM generation to become a permanent grid asset, which leads some data center companies to wonder, “if we bring the generation with us, can we get on the grid faster?”

Another energy bridging solution is utility innovation. Utilities have built at speed and scale a generation ago,

and they are actively seeking innovative ways to do it again. How to more quickly engineer, site, permit, and construct new substations is a key focus for utilities today given the economic development benefits of siting data centers in their communities.

Another way some utilities are innovating is to look beyond traditional capacity thinking by incentivizing more flexibility across all customers. A more flexible demand profile allows more data center demand

onto the grid without significant upgrades. Utilities are exploring innovative contracts to compensate customers who may be willing to provide demand flexibility for a small number of hours. On the policy side, government funding can play an important role. For example, funding in the US from the Department of Energy and National Labs to support making networks and customer demand more intelligent, facilitating the addition of new loads.

These three bridging strategies - BtM, innovative engineering approaches, and additional grid flexibility - can help shrink lead times for getting physical grid infrastructure in place.

The Role of Policy and Regulation

The roundtable participants highlighted the importance of aligning timelines and requirements across government agencies and utility regulators. For example, data center developers are increasingly being required to pay large upfront payments to get into queue for power even though there are no clear timelines for connection.

These fees are causing investors and developers to more actively contemplate BtM solutions or siting in areas with more friendly policies. Beyond a certain point, queue fees could be counterproductive, discouraging grid connection from credit worthy customers that offer attractive features for utilities.





This dynamic may spawn further market innovation as BtM owners may not want to operate generation assets long term and such assets may ultimately move onto the grid.

Against this dynamic backdrop, utility regulators will need to continue to thoughtfully design tariffs and study fees to protect customers while avoiding discouraging grid utilization.

Gas and Electric Coordination

When data center companies are examining options for access to power due to delays in grid interconnections, renewables are a low-cost option, but building on-site gas generation brings the crucial benefit of economically supporting 24/7 loads. While renewables are the ideal choice from a sustainability perspective, intermittent supply does not meet the need for consistent supply and filling the gap with batteries brings its own challenges.

The result is that some markets are witnessing more data centers attempt to secure large gas grid interconnections to provide another source of reliable power. This trend will further emphasize the need for coordination between the gas and electric grids.

Accelerating Deployment of Next Generation Technology

New technologies will be crucial over the long term. From small modular reactors (SMRs) and geothermal, to high-capacity conductors and data center cooling, significant advances are needed. Lack of promising technology isn't the constraint—it's deployment.

The roundtable emphasized the potential role of geothermal energy and SMRs in providing clean,

firm power for data centers, and the importance of supporting research and advancement in these technologies. Zero carbon power would be an ideal solution for data centers, drastically minimizing emissions and helping to meet sustainability goals, a topic which customers are still very interested in. A path to scaled deployment will require removing obstacles to full-scale demonstration, building confidence in the technology and opening the door for cost reductions.

Large scale nuclear resources could also be part of the solution due to the scale of data center developer investments, which are in some instances exceeding 500 MW at a single site. Existing nuclear resources are benefiting from this growing interest, and new long-term contracts could allow them to stay online and uprate their facilities.

Embedding Community Engagement

The roundtable also reinforced the need for effective stakeholder engagement to address concerns and ensure successful project implementation. This engagement is crucial across the full value chain from power supply and delivery to data centers themselves.

Working closely on the ground with communities and local stakeholders is key to demonstrating the benefits of new projects and garnering support. Data center development provides job creation both during construction and operation, as well as investment in community infrastructure and workforce development programs. Digital infrastructure enables constituents to stay connected in their personal and professional lives. The industry can do a better job to help to connect these dots for policy makers and communities.

THIS IS NO LONGER JUST A UTILITY ISSUE
OR A DATA CENTER ISSUE. IT'S A NATIONAL
ECONOMIC AND INFRASTRUCTURE
CHALLENGE. AND WE NEED TO SOLVE IT
TOGETHER.





Key Takeaways

- *Collaboration is Key:* Effective collaboration between technology developers, power providers, and policy makers is crucial to accelerate infrastructure development and meet growing demands.
- *Flexibility and Innovation:* We can unlock additional capacity and improve speed to power through better gas and electric coordination, leveraging customer flexibility, and deploying innovative technologies.
- *Policy and Regulatory Alignment:* Faster project deployment is possible through efforts to align policies and regulations in support of economic development and competitiveness.

- *Community Benefits:* The industry can improve perceptions and connect the dots by demonstrating how data centers are crucial for running the modern economy and at the same time significantly benefit local communities through job creation and infrastructure improvement.

What's Next? Collaboration, Creativity, and Continued Dialogue

Despite the challenges, the group remained optimistic. There is an enormous amount of serious effort and capital being deployed to solve these problems; what is critical now is speed—and working together to craft innovative strategies.

If you are interested in participating in our next Power and Technology roundtable, please reach out to your ERM contact to be connected to this series.

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