A State Playbook for Managing Data Center-Driven Load Growth

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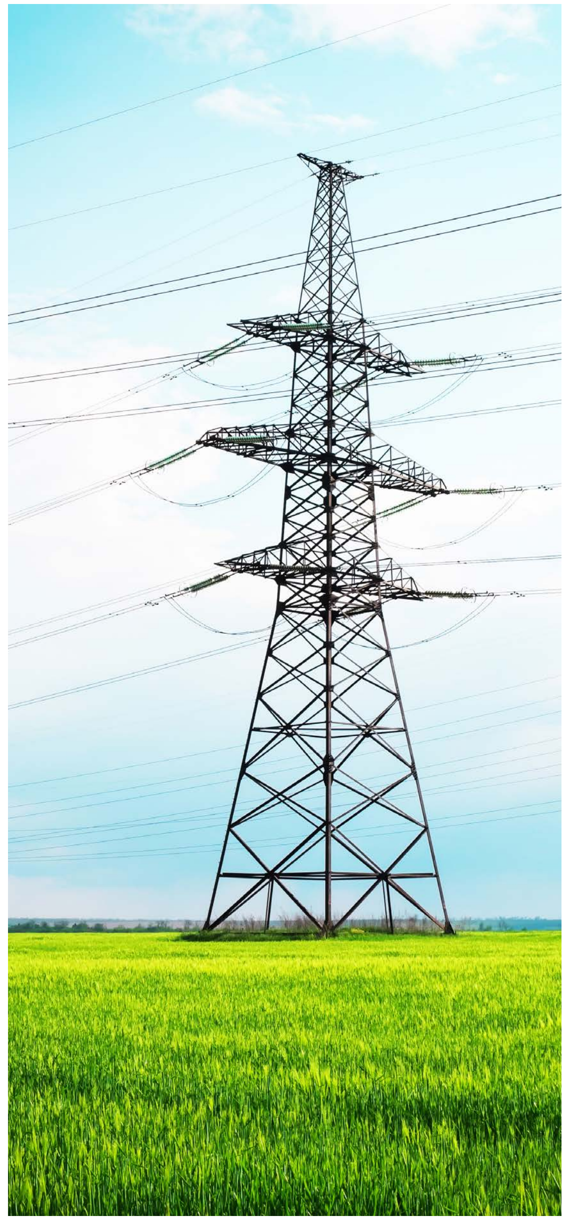
Executive Summary

This "Data Center Playbook" is designed to provide state policymakers with an understanding of how data centers interact with our electric grid, with a focus on practical solutions for addressing the opportunities and challenges associated with this burgeoning industry. There can be a sense that States are powerless in the face of explosive data center-driven load growth — that data center load growth is akin to a natural disaster that cannot be managed. The reality, however, is that States across the country are already deploying a variety of powerful tools to manage data center load growth, meet their economic development goals, and protect ratepayers from excessive financial risk.



Electricity usage associated with data centers, advanced manufacturing, and other large loads are projected to increase significantly over the next five years. However, there is "deep uncertainty" about these projections.[1,2] Whether or not these projections turn out to be accurate, significant investments are being made *today* in the high-voltage transmission grid and for new power plants to make it all work. Not only are upgrade grid costs passed on to electricity consumers, but high growth scenarios is leading to higher energy and capacity market prices as well, threatening to increase energy poverty in America.[3] In some parts of the country, planning for mass data center expansion is contributing to energy shortages,

1 *Jonathan Koomey, et al.*, Electricity Demand Growth and Data Centers: A Guide for the Perplexed, Bipartisan Policy Center, (Feb. 2025) *available at*: https://bipartisanpolicy.org/report/electricity-demand-growth-and-data-centers/.

2 *Brian Martucci*, Utility Dive, "A fraction of proposed data centers will get built. Utilities are wising up", (May 15, 2025) *available at*: https://www.utilitydive.com/news/a-fraction-of-proposed-data-centers-will-get-built-utilities-are-wising-up/748214/ ("Conservatively, you're seeing five to 10 times more interconnection requests than data centers actually being built," said Astrid Atkinson, a former Google senior director of software engineering").

3 *See, e.g., Ethan Howland,* Utility Dive, "New Jersey Residential Customers Face 20% Bill Hikes, Driven by PJM Capacity Prices: BPU (Feb. 13, 2025) *available at*: https://www.utilitydive.com/news/new-jersey-electric-bills-pjm-bpu-pseg-auction/740053/.

raising concerns about the reliability of the underlying grid.[4]

This playbook attempts to provide policymakers a pragmatic approach to balancing economic development opportunities with the need for new investment in the transmission and generation sectors, while preserving energy affordability, reliability, and clean energy goals. Key challenges for state policy makers addressed in this document include:

- How do we enable solutions that can overcome "time-to-power" challenges to achieve the economic development benefits associated with data center without saddling ratepayers with unnecessary risk?
- How do we ensure that data centers pay their fair share of transmission costs?
- Can we manage the risk that we over-invest in energy infrastructure if data center load does not materialize as projected?
- How do we ensure that supplies of energy remain adequate and affordable in the face of data center expansion?
- How do states with clean energy policies ensure data center expansion is handled in a manner consistent with those policies?
- How do we account for the asymmetry of the risk profile, where data centers have little risk associated with bullish forecasts, while consumers bear significant financial risk?
- How do policymakers responsibly secure the economic development benefits associated with data centers?

4 *See, e.g.,* North American Electric Reliability Corporation, *2023 ERO Reliability Risk Priorities Report* (Aug. 2023) at p. 23, *available at*: https://www.nerc.com/comm/RISC/Related%20Files%20DL/RISC_ERO_Priorities_Report_2023_Board_Approved_Aug_17_2023.pdf ("Driven by electrification, hydrogen production, data centers, crypto mining, and other computational and energy-intensive methods such as artificial intelligence (AI), new loads can emerge and grow faster than generation and transmission can be built.")

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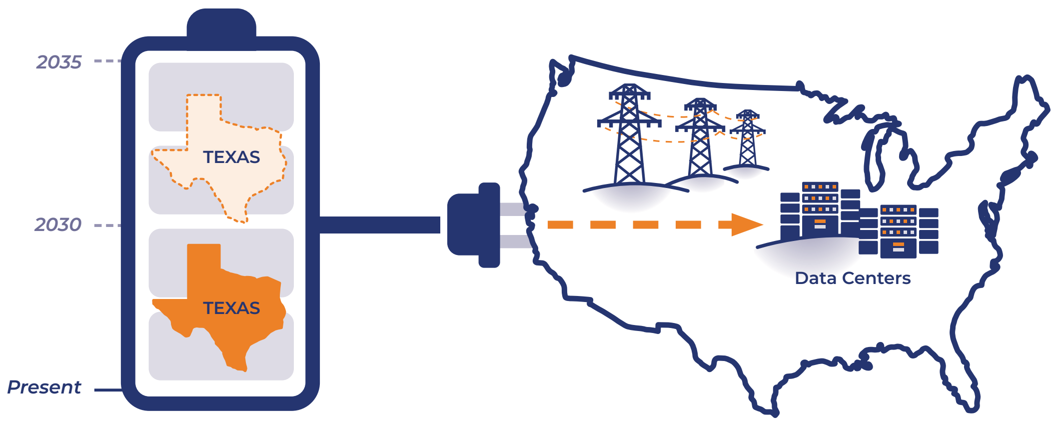
Introduction

This guide is designed to provide suggestions to interested regulators looking for pragmatic solutions to the challenges and opportunities associated with the rapid adoption of artificial intelligence and other data center technologies. Questions such as "is the data center power frenzy just the latest of a long line of energy sector bubbles, or is it the dawning of a new normal?"[5] are effectively impossible for policymakers to evaluate. Energy usage projections, however, can be eye-popping with some analyses suggesting that data centers will consume more than 10% of all energy produced in the U.S. by 2030.[6]



Even the more sober projections from the Federal Energy Regulatory Commission ("FERC") are estimated to be between 13-55 gigawatts ("GW") of additional power consumption by 2030.[7] Other estimates put the number closer to 100 GW.[8] Currently in the U.S., data centers account for about 4% of the total electricity consumption.

To put this in context, meeting 55 GW of new load would require putting approximately 50 new large nuclear units into service before the end of the decade, each similar to the Plant Vogtle AP1000 deployed in Georgia, which took 15 years to construct.[9] Data center load growth is also prone to extreme geographic concentration. Virginia's "data center alley" is predicted to grow

5 *Michael Liebreich*, "Generative AI – The Power and the Glory," BloombergNEF (Dec. 24, 2024) *available at*: https://about.bnef.com/insights/clean-energy/liebreich-generative-ai-the-power-and-the-glory/.

6 *See, e.g.*, McKinsey & Co., which projects between 11-12 percent of U.S. power going to data centers by 2030 (Sept. 17, 2024), *available at*: https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power; *see also* Powering Intelligence: Analyzing Artificial Intelligence and Data Center Energy Consumption. EPRI, 28 May 2024 (projecting 9% of U.S. consumption by 2030).

7 For a summary of load growth estimates, *see* FERC's "State of the Markets Report for 2024" at p. 7 and fn. 13. *Federal Energy Regulatory Commission* (March 20, 2025), *available at:* www.ferc.gov/news-events/news/SMR-2024.

8 Analysis from Grid Strategies suggests that aggregating utility load growth estimates is closer to 100 GW over the next 5 years. *See John Wilson, et al.*, Grid Strategies - Strategic Industries Surging: Driving US Power Demand (December 2024), *available at*: gridstrategiesllc.com/wp-content/uploads/National-Load-Growth-Report-2024.pdf

9 Southern Company's Vogle reactors were seven years late and cost more than $35 billion, twice the initial estimate. E&E News, "After Vogtle, What's Next for Nuclear?" (April 30, 2024) *available at*: https://www.eenews.net/articles/after-vogtle-whats-next-for-nuclear/.

by more than 500% by 2039,[10] while an Ohio utility recently reported that it was anticipating 8 percent annualized load growth from 2025 - 2028, resulting in tens of billions of dollars in new transmission spend.[11]

Electricity usage increases of this magnitude have not been seen since the 1950s, '60s, and '70s when rural electrification and the expansion of the American middle class drove massive load growth.[12] Further, the massive hyperscale data centers capable of consumer hundreds of thousands of megawatts of electricity are still relatively new, so there is little established track record to differentiate froth and reality.[13] And electric utilities have an established track record of over-stating load growth over the past decade.[14] However much electricity data centers end up using, the fact is that today's projections are simply guesses — the real answer is likely to be significantly higher or lower, which means that regulators need to plan for a variety of future scenarios.

10 "Virginia Data Center Study: Electric Infrastructure and Customer Rate Impacts." Virginia Joint Legislative Audit and Review Commission at p. 24 (Dec. 2024), *avilable at:* jlarc.virginia.gov/pdfs/presentations/JLARC%20Virginia%20Data%20Center%20Study_FINAL_12-09-2024.pdf.

11 AEP 4th Quarter 2024 Earnings Presentation at p. 14, *available at:* https://docs.aep.com/docs/newsroom/resources/earnings/2025-02/4Q24EarningsReleasePresentation.pdf.

12 *Wilson, John, et al.,* Strategic Industries Surging: Driving US Power Demand, a p. 5 (Dec. 2024), *available at:* https://gridstrategiesllc.com/wp-content/uploads/National-Load-Growth-Report-2024.pdf.

13 As ChatGPT itself notes, "While discussions about data center energy consumption date back over a decade, the framing of data centers as primary contributors to national electricity demand growth became prominent in mainstream media and policy reports around 2023" and that "[t]his surge … aligns with the rapid expansion of artificial intelligence (AI) technologies and the corresponding increase in energy demands from tech giants such as Amazon, Microsoft, Google, and Meta." ChatGPT4.o, in response to a query about when data center load started increasing.

14 *See Jonathan Koomey, et al.*, at figure 3 - making the point that Georgia Power's load forecasts over the past decade have systemically over-predicted actual load growth.

Data Centers and the Transmission System

New data centers often necessitate upgrades to transmission and distribution infrastructure to interconnect safely. The necessary upfront investment can be large, and the payback period is long — that is, a new data center customer must pay for transmission service over many years before the utility recoups its investment. If the data center does not operate long enough – or it never shows up in the first place – it is the utility's remaining customers that pay for the now unnecessary infrastructure.

This raises several potential issues that State regulators may wish to consider – most critically:

- how to ensure that the up-front transmission investment needed to connect new data centers does not significantly raise rates for all retail customers; and
- how to protect customers against the risk that they end up paying for transmission investments if the new data centers end up using less electricity than the data center requested from the utility.

Traditional utility ratemaking principles spread the costs of new transmission facilities necessary to serve load across all customers that benefit from those upgrades — a practice known as socializing or "peanut-buttering" costs.[15] Transmission rates include many "embedded costs" associated with the day-to-day running of a utility that do not vary directly with electricity usage. These fixed embedded costs include things like the utility's cost of providing round-the-clock operations, inspections, repairs to failed equipment, service calls, regulatory compliance, accounting, customer billing, connecting new customers, staffing, etc.

Generally, the more electrons a utility sells, the lower the transmission rates get. More customers allow the utility to spread the fixed costs of operating the grid over more customers. Spreading the costs broadly reduces transmission rates for all users of the system — since the total cost of operating the transmission grid (the numerator) is spread over more sales (the denominator), resulting in a lower $/kilowatt-hour charge.[16]

Cost Increases

New investments in transmission infrastructure are typically recovered over 40 years or more. The ongoing operation and maintenance of the new assets will add to the "embedded cost"

15 *See, e.g.*, *Illinois Commerce Commission v. FERC*, 721 F.3d 764 (7th Cir. 2013) (describing various methods of cost allocation and requiring that costs must be "roughly commensurate" with benefits).

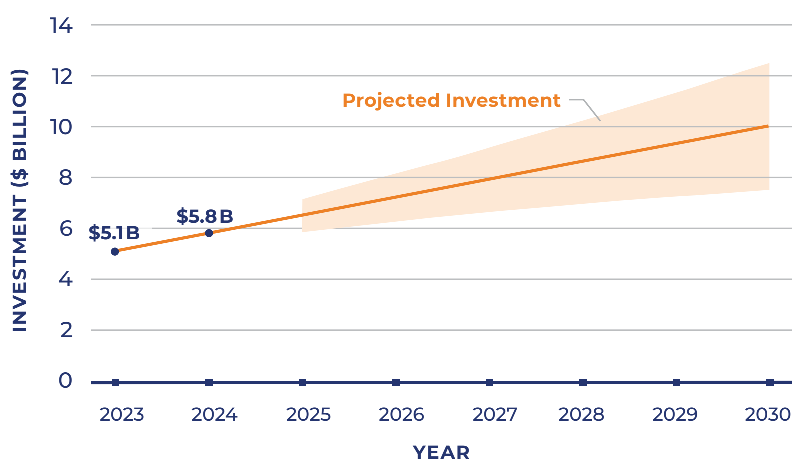
16 Imagine a hypothetical system with a revenue requirement of $1000 dollars and serving 100 customers each taking 1 MW of service. The volumetric rate paid by each customer would be $10 per year. Serving the 101st customer adds only a tiny amount to the utility's revenue requirement, but results in each customer paying a slightly lower volumetric rate.

of the transmission grid, increasing the cost of transmission service for all customers.[17] These costs continue for as long as the new transmission lines are in service, and the cost accrues, regardless of how much energy flows on the lines. Further, there is a significant lag between the time the new transmission costs show up in customer bills and when new customers begin contributing to the fixed operating costs of the system. Data centers, which often come online in stages, can exacerbate these timing issues.

One example of transmission-related bill increases showing up is playing out in PJM Interconnection, LLC ("PJM") right now. PJM is the largest electricity market in the world and home to Northern Virginia's "Data Center Alley." PJM has announced more than $10 billion in new transmission investment needed to maintain system reliability in just the last two years, largely in response to data center-driven load growth.[18] A major portion of these new upgrades are intended to serve new data center load, particularly in Virginia and Ohio.

- Dominion Electric, Virginia's largest utility, expects to see $12.9 billion in new transmission expenditures between 2024 and 2029 to meet an expected 88% increase in data center load from July 2024 to February 2025 (from 21.4 GW to 40.2 GW).[19]
- American Electric Power ("AEP"), a large utility in Ohio with significant data center load growth, anticipates that it will spend over $30 billion on new wires between 2025 – 2029.[20]

These new expenditures are on top of transmission rates in PJM that have already increased by almost 25% between 2020 and 2025. These new costs are putting significant upward pressure on customer bills. Eventually, the new data center customers will begin paying transmission bills that will contribute to the fixed costs of meeting the transmission grid — if they take transmission service in the quantities reflected in their initial requests for service.



17 The Regulatory Assistance Project's "Electric Cost Allocation for a New Era" provides a deeper dive into cost of service ratemaking. *Available at*: https://rapstaging.wpengine.com/knowledge-center/electric-cost-allocation-new-era/.

18 *See* "Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board, PJM Staff White Paper (February 2025) ("This yields an overall RTEP net increase of approximately $6,654.01 million to resolve baseline criteria violations, for which PJM recommended Board approval.") *See also* Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board (February 2024) ("On December 8, 2023, the PJM Board of Managers approved changes to the Regional Transmission Expansion Plan (RTEP), totaling a net increase of $5,085.85 million for baseline projects, to resolve baseline reliability criteria violations, address changes to existing projects and project cancellations.")

19 *See* Dominion 4th Quarter 2024 Earnings Presentation, at pp. 18 and 46 (Feb. 12, 2025), *available at*: https://s2.q4cdn.com/510812146/files/doc_financials/2024/q4/2025-02-12-DE-IR-4Q-2024-earnings-call-slides-vTCII.pdf.

20 *See* AEP 4th Quarter 2024 Earnings Presentation, at p. 14, *available at:* https://docs.aep.com/docs/newsroom/resources/earnings/2025-02/4Q24EarningsReleasePresentation.pdf.

Stranded Cost Risk

Stranded cost risk can occur when data centers use less electricity than they predicted or where the data center stops taking service altogether.[21] A substantial reduction in data center energy consumption means that, instead of payments from the data center going to pay off the transmission investment and funding a portion of the costs of running the grid, remaining customers would be left paying for a more expensive grid without offsetting revenues.

One of the most difficult aspects of the data center expansion is the asymmetric allocation of risk between data center and non-data center customers. Under the current rules, data centers have relatively little to lose by coming in with rosy projections of electricity demand. However, as data centers become an ever-larger share of U.S. electricity consumption, the rate risks to non-data center utility customers also become more concentrated.

It is important to recognize that these risks can materialize without any malfeasance from data center operators. Evolving business models, more efficient AI models, cyclical downturns in data needs, the introduction of quantum computing, or simply energy efficiency gains that decreases the amount electricity each server rack consumes, can all decrease data center electricity usage. For example, Power Usage Effectiveness, or PUE, is a measure of the energy efficiency of a data centers. The lower the PUE, the higher the energy efficiency, PUEs have dropped from above 2.0 in 2010 to less than 1.2 today.[22] Indeed, as others have noted, it is possible to draw similarities between today's AI craze and the Dot-com Bubble of the late 1990s, where "irrational exuberance" led to sectoral downturns in the nascent internet economy.[23] Whatever the reason, captive utility customers can be left holding the proverbial bag if data center usage comes in at lower-than-projected levels.

As AEP succinctly put it in a filing before the Ohio Public Utility Commission, "[i]f the massive load requests fully materialize, then the massive investment will be fully justified and the continued trajectory of economic development associated with data centers will result in a "rising tide that will raise all ships." But if the massive load requests do not fully materialize, should the costly, now-unnecessary infrastructure be paid for by the data centers themselves, or should other customers bear this risk? This is a classic zero-sum situation — any gain for one side is a loss for the other. If data centers bear less risk, other customers bear more risk, and vice versa."[24]

21 *See* Post-Hearing Reply Brief of Ohio Power Company, filed in Case No. 24-508-EL-ATA on April 9, 2025, *available at*: https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=24-0508.

22 *See Arman Shehabi, et al.,* "2024 United States Data Center Energy Usage Report," Lawrence Berkeley National Laboratory (Dec. 2024), available at: https://eta-publications.lbl.gov/sites/default/files/2024-12/lbnl-2024-united-states-data-center-energy-usage-report.pdf?utm_source=chatgpt.com.

23 *See, e.g., Sajal Singh*, "AI Bubble Signals from History," *Insights: IE University*, April 29, 2025 ("The AI market's soaring valuations and speculative investment raise concerns of a potential bubble, despite its transformative potential.")

24 *See* Post-Hearing Reply Brief of Ohio Power Company, filed in Case No. 24-508-EL-ATA, April 9, 2025, before the Ohio Public Utilities Commission, *available at*: https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=24-0508.

Data Centers & the Supply of Energy

One of the most significant challenges for meeting data center load is ensuring that there is sufficient energy to power them. In various parts of the country, the speed and size of the demand growth has challenged the ability of utilities and grid operators to maintain a sufficient supply of generation to ensure a reliable system, or "resource adequacy," in energy-speak.[25]

New generation is expensive, with large new gas-fired power plants typically costing north of a billion dollars apiece. Regulators are struggling to balance reliability needs, clean energy objectives, and customer affordability, with increased data center demand for additional electricity. A number of vertically integrated utilities, including Duke,[26] Southern,[27] Entergy,[28] and Dominion,[29] to name just a few, have proposed substantial new investments in a variety of generation technologies to support increased data center and other large industrial loads.

In the PJM region, the Nation's largest power market, capacity costs to consumers rose from $2.2 billion to $14.7 billion in a single year.[30] While the increase was certainly driven by a variety of factors, the data center load was a significant driver of cost increase, with load growing by 3,500 MW, compared to 514 MW of excess generation in the market.[31] Load is expected to grow by another 3,300 MW for the 2026/2027 delivery year.[32] As the Independent Market Monitor for PJM put it, "[a]lthough large data center loads are widely discussed, the extreme impacts that the addition of those loads has already had, and will have again in the next auction, on capacity market clearing prices does not seem to be generally appreciated in discussions of the capacity market."[33]

ERCOT, the grid operator in Texas, is anticipating even larger load growth, with data centers

25 Resource adequacy is a measure of the ability of the electric grid to produce and deliver electricity when and where it is needed, even on the hottest summer day or coldest winter day. Generally, an electric grid is "resource adequate" if there is a sufficient supply of generation available to meet all customer demand, plus a reserve margin, such that we would not expect more than one loss of load event every ten years. 2023's tragic Winter Storm Uri in Texas is an example of what can happen if resource adequacy is not maintained.

26 "Duke Energy Prepares for Record Load Growth While Delivering Value to Stakeholders and Customers, CEO Tells Shareholders at Annual Meeting." *Duke Energy | News Center*, (May 2025), *available at:* news.duke-energy.com/releases/duke-energy-prepares-for-record-load-growth-while-delivering-value-to-stakeholders-and-customers-ceo-tells-shareholders-at-annual-meeting.

27 "US Power Provider Southern Co Raises Capital Investment Plan by 30%." *Reuters*, 20 (Feb. 2025), www.reuters.com/business/energy/southern-co-misses-fourth-quarter-profit-estimates-higher-interest-costs-2025-02-20/.

28 Energy is proposing to rate-base 3 new combined-cycles (2,260 MW, ~$3 billion), along with 100+ miles of high-voltage transmission lines to supply a new Meta data center. Entergy asserts that Meta's "large financial commitment from the Customer is expected to result in substantial cost savings for [Entergy's] other customers for years to come." Filing before the Louisiana Public Service Commission in Docket No. 32146; *see also* "Entergy 2023 Performance Report" *available at:* Performancereport.entergy.com, 2024.

29 Dominion Energy | Delivering on Our Plan: 2024 Annual Report. 2024.

30 *2025/2026 Base Residual Auction Report*. PJM, 30 July 2024.

31 *See* "2025/2026 Base Residual Auction Results," (Aug. 21, 2024), *available at*: https://www.pjm.com/-/media/DotCom/committees-groups/committees/mic/2024/20240911/20240911-item-09---2627-planning-parameters.ashx.

32 *See* "Planning parameters for the 26/27 BRA to the Market Implementation Committee" (Sept. 11, 2024), *available at*: https://www.pjm.com/-/media/DotCom/committees-groups/committees/mic/2024/20240911/20240911-item-09---2627-planning-parameters.ashx.

33 Pre-Conference Testimony of Dr. Joseph Bowring, Independent Market Monitor for PJM in Docket No. AD25-7-000, at p. 3.

and crypto load expected to expand by approximately 30 GW by 2030.[34] The Mid-Continent Independent System Operator, serving the Midwest, capacity prices for the upcoming summer season rose to $666.50/MW-day from last year's $30/MW-day summer season, attributable, in part, to rising load forecasts.

The fact that data centers can come online faster than new generation can deployed has important downstream impacts on energy and capacity costs for retail customers. Large new data center investments first eat into the existing reserve margin. Lower reserve margins tend to increase energy and capacity prices.[35] If the data center deployment is large enough, it can substantially increase ratepayer costs and even put a utility or region into a reliability crisis.

Further, delays in bringing new generation to market is making the challenge worse. Interconnection delays, siting and permitting challenges, and supply chain limitations resulting in a 5+ year development time horizon.[36] Given that data centers can materialize in less than two years, data center expansion often outpaces generation deployment.

Under existing law in most states, the costs of new generation resources needed to serve load growth are generally spread evenly over all customers. Similar to the risk of stranded transmission assets if the data center load does not materialize as projected, overbuilt generation can result in excess new generation that all customers pay for. Energy sage, Amory

34 *See* ERCOT Adjusted Large Load Breakdown, *available at*: https://www.ercot.com/gridinfo/load/forecast.

35 *K. Carden and J. Pfeifenberger,* "The Economics of Resource Adequacy Planning: Why Reserve Margins Are Not Just About Keeping the Lights On," National Regulatory Institute (Apr. 2011), available at: https://www.brattle.com/wp-content/uploads/2021/08/The-Economics-of-Resource-Adequacy-Planning-Why-Reserve-Margins-Are-Not-Just-About-Keeping-the-Lights-On.pdf.

36 For a comprehensive view of interconnection queue delays, *see* J. Rand, et al., "Queued Up: 2024 Edition Characteristics of Power Plants Seeking Transmission Interconnection," (April 2024), *available at*: https://emp.lbl.gov/sites/default/files/2024-04/Queued%20Up%202024%20Edition_R2.pdf.

Lovins, is even more blunt, arguing that "AI is being hyped and officially posited to justify more gas, coal, and nuclear power—all unneeded, uncompetitive, and likely to raise everyone's costs and risks."[37]

Whatever the scope of the challenge ends up being, states and corporate buyers (including many of the Big Tech data center operators) with clean energy policies are already struggling to power data centers with clean energy. As regional grid planners and utilities work to interconnect new generation in an accelerated manner to accommodate the projected load growth and place a priority on dispatchable resources, the result can be a portfolio mix that is at odds with many states' clean energy policies. For example, Duke Energy's Integrated Resource Plans include the addition of up to new 11 new natural gas turbines to meet energy demand from data centers and advanced manufacturing, reflecting the growing trend of prioritizing gas-fired generation to meet near-term load, potentially complicating longer-term state decarbonization goals.[38]

As discussed below in more detail, a number of states are contemplating conditioning data center connections on their bringing new clean energy generation resources to market ahead of, or in parallel with, data center growth. However, these types of requirements can also slow data center deployments, creating a conundrum for policy makers eager to embrace the economic development prospects associated with data centers and the AI revolution.

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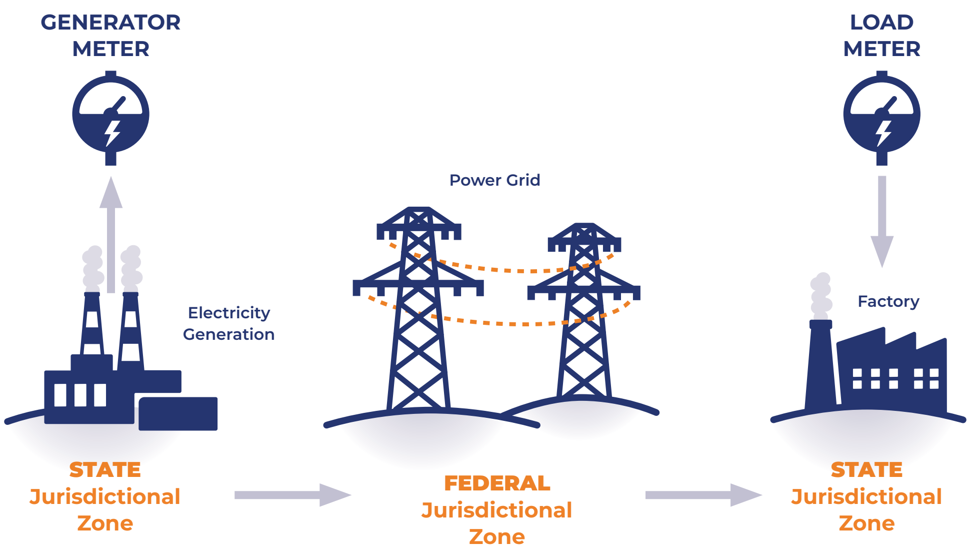
37 *Amory B. Lovins,* Artificial Intelligence Meets Natural Stupidity: Managing the Risks (May 10, 2025), *available at*: https://integrative-design-for-radical-energy-efficiency.stanford.edu/sites/extreme_energy_efficiency/files/media/file/data-centersaiel-dr-16-10-may-2025.pdf.

38 "Duke Energy and GE Vernova Announce Significant Arrangement for Gas Turbines and Associated Equipment." *Duke Energy | News Center* (April 2025), *available at:* news.duke-energy.com/releases/duke-energy-and-ge-vernova-announce-significant-arangement-for-gas-turbines-and-associated-equipment.

State & Federal Jurisdiction over Data Centers

Understanding the complicated relationship between state and federal jurisdiction over data centers is critical to crafting appropriate solutions. While the Federal Power Act ("FPA"), in theory, established a bright line between federal and state regulation of the electric power grid, the line often gets smudged in practice. When they are at their most effective, federal and state regulators often work together to protect retail customers, a philosophy amorphously referred to as cooperative federalism. Given the ability of data centers to shift costs across multiple states, a cooperative approach is desperately needed. Neither regulator can do it alone; state regulators have jurisdiction over retail sales of electricity, while federal regulators oversee transmission spending. As FERC notes, successful regulation of data centers "require the involvement of both federal and state actors, including the Commission, state public utility commissions, and other state and local entities."[39]



The FPA provides states with primary jurisdiction over retail sales, distribution facilities and over generation resources. FERC, by contrast, has primary jurisdiction over "transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce."[40] "[T]he FPA expressly reserves to states the authority over any other sale of electric energy, including retail sales and wholesale sales not in interstate commerce ... as well as the facilities used for the generation and distribution of electricity."[41]

39 *PJM Interconnection, et al.*, 190 FERC ¶ 61,115 at P 66 (2025) ("Show Cause Order").

40 FPA Section 201, 16 U.S. Code § 824 - Declaration of Policy; Application of Subchapter.

41 FPA Section 201, 16 U.S. Code § 824 - Declaration of Policy; Application of Subchapter.

It is important to recognize that the jurisprudence around data center jurisdiction is still evolving, and FERC itself has been publicly working through the details, particularly in relation to co-location of data centers in the Show Cause order. In that order, FERC wrote that:[42]

> …states retain exclusive jurisdiction over the terms of retail sales, generally including the rate designs that determine how the costs of the wholesale sale and transmission of electricity assigned to a wholesale customer are allocated among that wholesale customer's retail customers…. [Additionally,] states retain the authority through, for example, state franchise laws, to regulate which entities may make retail sales within their borders, as well as the rates, terms, and conditions of those retail sales.

The need for federal-state coordination is perfectly illustrated in an ongoing proceeding before the Ohio Public Utilities Commission.[43] There, Ohio utilities are battling over whether data center customers should be required to provide up-front deposits and commit to long-term agreements to take power over a decade before being allowed to connect to the grid. While long-term contracts, backed by postings of financial security, may protect the customers of a single utility, such payments do little to protect customers of other utilities — including those located in Ohio as well as those across the PJM footprint — from cost increases or the risks that data center load evaporates. Thus, transmission investments necessary to serve data centers cannot be contained to a single service territory or even a single state and quickly spill over into neighboring states. One approach is for states regulators to work with their federal counterparts to protect retail customers by imposing collateral and contract requirements that protect all customers.[44]

The concerns over data center cost allocation in fact echo concerns heard from red state regulators about being forced to bear the cost of blue state environmental policies which have become a flashpoint in FERC's recent Order No. 1920 long-term transmission planning rule.[45] FERC Commissioner Mark Christie issued an extensive dissent focused on the impact of one state's policies on consumer costs in other states.[46] That same dynamic is playing out here where pro-data center policies in one state are driving costs for neighbors.

42 *PJM Interconnection, L.L.C., et al.*, 190 FERC ¶ 61,115 at P 68 (2025).

43 *Kim, Yoon, and Yoon Kim.* "Guest Blog: Connecting Data Centers to the Grid: An Innovative and Controversial Proposal from AEP Ohio - Climate Law Blog." *Climate Law Blog*, Sept. 12, 2024, *available at:* blogs.law.columbia.edu/climatechange/2024/09/12/guest-blog-connecting-data-centers-to-the-grid-an-innovative-and-controversial-proposal-from-aep-ohio/.

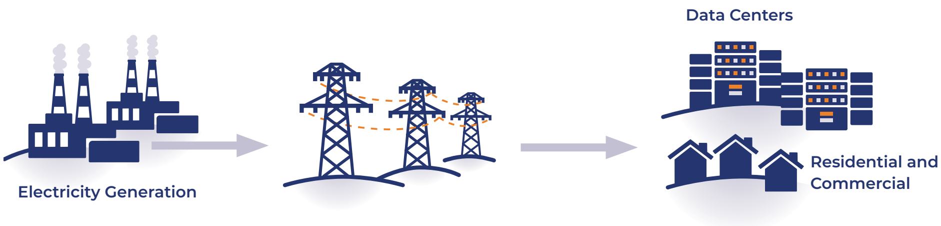
44 FERC and state regulators have famously worked together to solve tough issues in the past, including the Joint Federal-State Taskforce on Electric Transmission, and FERC 2006's small generator interconnection standards rulemaking, where FERC harmonized "state and federal practices by adopting many of the best practices … recommended by the National Association of Regulatory Utility Commissioners."

45 "Explainer on the Transmission Planning and Cost Allocation Final Rule." *Federal Energy Regulatory Commission*, 2023, www.ferc.gov/explainer-transmission-planning-and-cost-allocation-final-rule.

46 Dissent of then-Commissioner Mark Christie, at P 9, Order No. 1920, 187 FERC ¶ 61,068 (2024) ("the intent and effect of this shell game is to enable the costs of corporate and public policy-driven projects to be socialized across an entire multi-state region and thus shifted onto consumers in states that never agreed to bear such costs.")

Co-location of Data Centers with Existing Generation

The growth in data center load is happening at the same time as grid planners are facing ballooning generation interconnection queues and long delays in expanding the transmission grid. The lack of sufficient generation and transmission infrastructure is leading some data center developers to "co-locate" with existing generation to bypass conventional load interconnection processes, referred to as "grid connected" or "in-front-of-the-meter" connection. While the typical load interconnection process can take years, data centers can reduce their "time-to-power" by co-locating at the site of an already existing generator.

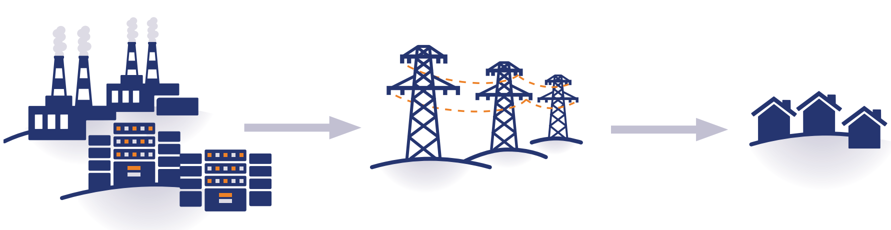


NO CO-LOCATION

All load customers pay for transmission service. All generators provide energy to load customers.

SOME CO-LOCATION

Most, but not all, load customers pay for transmission service. All grid generators continue to provide energy to load customers.



WIDESPREAD CO-LOCATION

Fewer load customers pay for transmission service, but the cost to operate the grid remains. All grid generators provide energy to load customers.

CO-LOCATION DEFINITION

A configuration when end-use customer load is physically connected to facilities of an existing or planned generation interconnection customer on the interconnection customer's side of the point of interconnection to the transmission system.[47]

47 PJM Guidance on Co-Located Load (Mar. 2024), available at: https://www.pjm.com/-/media/DotCom/markets-ops/rpm/rpm-auction-info/pjm-guidance-on-co-located-load.pdf. While PJM's guidance document was since rescinded, the definitation remains helpful.

From an engineering or reliability perspective, there are many similarities between a colocation configuration and a typical in-front-of-the-meter load interconnection.[48] However, from a regulatory or transmission cost allocation perspective, there are notable differences that are important from the point of view of a state regulator:

- *First,* co-location arrangements often result in new data center loads getting connected faster that they would be if they had connected through traditional systems, meaning that the resource adequacy and financial challenges are accelerated, along with economic development opportunities.
- *Second,* generators do not pay for transmission service, while grid-connected loads (even with on-site generation) do.
- *Third,* co-located generators are no longer available to sell energy and capacity to the larger market, creating potential reliability and other challenges that may arise quickly.

Thus, whether a load connects through a traditional grid connection or a meter for a generator interconnection results in similar electrical impacts but sizably different rate impacts.

In early 2025, FERC initiated a Show Cause order (Docket No. EL25-49-000) to address concerns associated with co-location raised in multiple dockets. This high-stakes regulatory proceeding is ongoing as of June 2025 and is likely to shape the future of co-location of data centers with existing generators.

Transmission Revenues: The reduction in transmission revenue associated with co-location can be significant. Exelon Corporation, the owner of several large transmission-owning utilities, recently testified that co-locating 1 GW load at an existing nuclear facility in the Chicago area would result in the utility losing approximately $253 million in annual transmission charges — costs that "will be borne by others in the PJM footprint."[49] This translates into a $53 increase in the average residential customer's bill in Illinois, or a 3.19% increase.[50]

Co-location advocates, on the other hand, argue that loads operating entirely behind an existing generation meter do not use the transmission grid and thus do not cause additional costs to be incurred. "[E]ntities that do not use the transmission system should not be allocated costs associated with it."[51] However FERC ends up resolving this hotly contested issue, the dollars at stake are large and the outcome will certainly be subject to extensive litigation.

48 *See,* e.g., Post-Technical Conference Comments of Suzanne Glatz and Abraham Silverman, FERC Docket No. AD24-11-000, at p. 7.

49 Comments of Exelon Corporation, Affidavit of Mr. John Reed and Ms. Danielle Powers, at ¶ 9 and Attachment A, FERC Docket No. EL25-20-000 (Dec. 12, 2024) ("Reed/Powers Affidavit"). As Mr. Reed and Ms. Powers explain: "These costs do not simply disappear. Instead, they must be borne by other consumers within the PJM footprint. This redistribution of costs is what defines cross-subsidization: when one group of consumers (in this case, the co-located load) benefits from avoiding certain fixed charges and other costs, the financial burden is placed upon another group of consumers, leading to cost increases and an inequitable cost allocation for these consumers."

50 Reed/Powers Affidavit, at Attachment A.

51 Joint Comments of PJM Industrial Customer Coalition and Industrial Energy Consumers of America in Docket No. EL25-49, at p. 3. *See also* Electricity Consumers Resource Council (ELCON) in Docket No. EL25-49, at p. 2 (""Large loads that choose to completely self-supply by connecting to their own generation and not taking any grid services should not be allocated any grid costs unless there is some concrete demonstration that such configuration has a direct cost impact on other grid consumers.")

Generation Supplies: Co-location with existing generation also raises concerns about how such arrangements could affect resource adequacy and energy markets.[52] Under the current paradigm, a generator who elects to sell its output to a co-located load is typically assumed to be unavailable to sell capacity to the larger grid. This effectively means that, for capacity purposes, a co-located resource effectively "retires" from the grid. This changes the availability of the existing generator, alters demand forecasts, and can lead to steep increases in wholesale energy and capacity prices. For example, PJM relies on capacity markets to secure resources, and co-location removes this generation from the market, resulting in reduced available capacity, higher prices, and reduced reliability.

Example

The Calvert Cliffs Nuclear Power Plant provides Maryland with 1790 MW of capacity, 40% of the state's generation. The Independent Market Monitor (IMM) for PJM evaluated the impacts from losing this nuclear power plant's generation to new large energy consumers and found that losing 1,000 MW of power from Calvert Cliffs would increase costs to Maryland customers in the 2025/2026 Base Residual Auction (BRA) by $332M. If all nuclear across the PJM footprint (~10,000 MW) were to enter into co-location agreements, the IMM found that customers across the PJM region would face increased costs of roughly 70%, or approximately $18 billion annually. The IMM is not the only one commenting on this, as Google's US Federal Lead, Brian George, stated at a recent FERC technical conference that "behind-the-meter negatively impacts market operations and reliability. It removes capacity from general supply."

State regulators play an important role in regulating these data center arrangements. States "retain exclusive jurisdiction over the terms of retail sales, generally including the rate designs that determine how the costs of the wholesale sale and transmission of electricity assigned to a wholesale customer are allocated

52 *See, e.g.*, Show Cause Order, at P 88, Question E, asking about resource adequacy and capacity market impacts of co-location.

When load is "served" behind a generator meter, how should the cost of transmission service be determined?

Consider the analogy of running a restaurant to running a grid. A restaurant owner may have a mix of capital investments and operating costs associated with a building, cooking appliances, furnishings, and many other costs to run a business. The restaurant must also purchase food ingredients, prepare the dishes, and deliver the same to its diners. The menu prices reflect not only the cost to prepare the dishes, but also a portion of the embedded cost. Like transmission service rates, the menu prices are an approximation since not all diners will purchase the same amount of food but will still occupy the same tables and enjoy the benefits of dining at the restaurant. What happens if customers could dine at the restaurant, but purchase very little or no food? The restaurant owner would be forced to raise menu prices for other customers to adequately cover its costs.

Co-located load that takes service directly from a generator can be compared to a customer who purchases food from a street vendor and then consumes it while sitting in the restaurant and therefore does not assume any share of the cost for dining in the restaurant. Like the restaurant owner, the grid owner(s) must decide if it will allow load to connect to the grid via a generator connection, and if so, must determine what a just and reasonable charge is for that privilege.

among that wholesale customer's retail customers."[53] Further, "it is within a state's exclusive jurisdiction to determine how those FERC-approved rates are collected among the relevant retail consumers along with the rates for state-jurisdictional matters."[54] The same goes for wholesale sales to the extent that they are not in interstate commerce, which likely includes sales of electricity from a generator to a co-located data center.

53 FERC Show Cause Order at P 68.

54 Id.

Energy “Islands” or Isolated “Energy Park”

Some in the industry have proposed to encourage new, large loads to build new “energy parks” or “energy islands” that are completely isolated from the larger transmission grid.[55] Essentially, this would be a microgrid isolated from the rest of the power grid and largely exempt from federal regulations addressing the transmission and sale of electricity in interstate commerce.

As the grid is facing lengthy times to build needed infrastructure and interconnect new generation, an interim solution of an isolated energy island could allow data centers to be built and energized in advance of new upgrades being completed. Once the needed transmission infrastructure is built and grid-connected generation is available to support the load, the data center could then be integrated into the grid. The generator(s) used in the energy island could remain at the site as back up resources or be relocated to support another large data center development.

The energy island concept could also be a permanent solution to serve large loads. While this configuration could avoid directly impacting the power grid, there are environmental and financial implications of expanding such arrangements, particularly since most energy island projects would rely primarily on natural gas- or diesel-fired generation. Further, without appropriate state regulatory action, islanded systems could avoid state taxes, Renewable Portfolio Standards, and other public benefits programs.[56]

To address the concerns, States could impose regulatory requirements for self-regulated isolated grids that serve load over a certain size (potentially 100 MW or larger). Requirements could include registering with the state commission as a load service provider with an energy island, impose minimum clean energy requirements for jurisdictions in which that is a priority, or other obligations similar to other utility service providers.

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55 *See* Post-Technical Conference Comments of Advocates for Consumer Regulated Energy (A4CRE) in Docket No. AD24-11-000, page 2 (proposing creation of “…entirely new entities, free from traditional regulatory oversight and designed to operate independently of existing grids and utilities” allowing deployment timelines that “far outpace those of conventional utilities.”)

56 Other impacts may be less obvious, such as the impact on the supply chain. As developers compete for access to critical equipment, such as turbines, the ability to get generation connected to the grid, to support grid load, may be impaired by the development of microgrids which would serve only a single facility. This could further undermine the ability of data centers to connect to the grid in a conventional manner, which would provide the highest level of reliability and likely more economically beneficial to all grid-connected load in spreading both resource adequacy costs and transmission costs.

Survey of State Policy Levers for Data Centers

LEVER #1

Improve Administrative Information Collection & Processing of Data Center Requests

State policymakers may wish to consider a list of (relatively) non-controversial improvements to the process of studying and connecting data centers to the grid. Today, most requests for new service are sequenced by the local utility with relatively little oversight from regulators. However, as the commercial stakes and cost implications for consumers have grown, so has the need for more formalized processes and collection of information from prospective data centers.

Fortunately, states have quite a bit of authority over the process by which utilities collect and process new load requests. The following are a series of administrative steps that state policymakers may wish to require their utilities to take.

Address Double Counting of Data Center Requests

Anecdotal accounts suggest duplicative requests for data centers that are adding to the high rate of load growth seen in many regions. While precise figures are "illusive,"[57] there does seem to be compelling evidence that some data center developers make requests for service in multiple locations or jurisdictions to determine which site has quickest time to power or the lowest cost of connecting.

One way to weed out duplicative requests is to require that an officer of the corporation certify that the data center is not duplicative of other data center developments under consideration by the same company. For example, legislators in Texas recently passed Senate Bill 6, requiring that a prospective data center customer indicate in its application for service "whether the customer is pursuing a substantially similar request for electric service … the approval of which would result in the customer materially changing, delaying, or withdrawing the interconnection request."[58] The

While there is nothing inherently wrong with speculative data center development or testing the feasibility of multiple locations, the risk of being "wrong," at least under today's cost allocation rules, is largely put on captive customers — not on the data centers. This asymmetry of risk provides state regulators a strong interest in ensuring that utility load forecasts are reasonably accurate.

57 *Lutz, Meris.* "A Fraction of Proposed Data Centers Will Get Built. Utilities Are Wising Up." *Utility Dive*, (May 15, 2025), *available at:* www.utilitydive.com/news/a-fraction-of-proposed-data-centers-will-get-built-utilities-are-wising-up/748214/.

58 "Texas SB6 | 2025-2026 | 89th Legislature." *LegiScan*, 2025, legiscan.com/TX/text/SB6/2025.

Texas proposal, while not establishing binding financial commitments, does ensure that the utility understands which data center applications have interdependencies and will lead to more accurate load forecasts.

Require Utilities to Ensure Load Forecast Reflects High vs. Low Probability Data Center Expansions

Utility load forecasts drive investment in new transmission and generation resources. Thus, it is of critical importance to state regulators that forecasts are as accurate as possible. Several utilities and grid operators have voluntarily begun collecting information about the likelihood of success from data center customers in order to enhance the confidence of their load forecasts.[59] State regulators may wish to require utilities to ask questions of prospective data center developers, including:

- Does the data center have site control over the land on which they are proposing to build?
- Can the data center provide evidence that it already has customers lined up to use the data center, whether in the form of binding contracts or evidence of other types of customer commitment (i.e., "commitment-backed" contracts)?
- Has the data center filed environmental or other necessary permits?
- Has the data center entered into binding equipment procurement or construction contracts?
- Does the data center have a plan for securing on-site backup generation, including equipment purchases?

While none of these questions, by themselves, are dispositive of a data centers' prospects, considering these factors can help utilities inform regulators about the realistic level of new load growth they expect in their service territory and allow "high" and "low" estimates of load growth, allowing utilities and regulators to move beyond the highly simplistic single load growth number that most utilities produce today.

Further, as noted below, many of these same informational requirements can be converted to binding requirements at some point in the future.

In 1999, Peter Huber and Mark Mills shared fears that "a billion PCs on the Web means electric demand equal to total U.S. output today." Amory Lovins, Jonathan Koomey, and others challenged this analysis, pointing to rapdily increasing energy efficiency of computers, as well as questioning some of the underlying assumptions of the analysis. Data centers are highly energy intensive now, they may see the same drastic increase in efficiency.[59]

59 PJM's Load Analysis Subcommittee for example, recently began running independent evaluations of the likelihood that data centers will come online in addition to relying on the utility's own load forecasts. *See, e.g.,* Mooney, Molly. "Load Adjustment Requests Summary for 2025 Load Forecast - Preliminary." *PJM* (Nov. 2024), *available at:* www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2024/20241125/20241125-item-05---preliminary-load-adjustment-requests-summary.pdf.

60 *See* "Exchanges between Mark Mills and Amory Lovins about the electricity used by the Internet," (Sept. 1999) *available at:* https://rmi.org/insight/exchanges-between-mark-mills-and-amory-lovins-about-the-electricity-used-by-the-internet/.

Require Utilities to Collect Better Information from Proposed Data Centers

Utilities do not typically collect information about data center energy usage in a uniform or comprehensive way. Citing confidentiality concerns, many data center developers are often reluctant to provide key information, such as peak load, load "shape" (e.g., usage patterns), ability to utilize onsite backup generation, or ability to curtail during times of grid stress. Similarly, data centers rarely come online all at once. Instead, data centers typically ramp up their electricity usage over a period of months or years. Accounting for these ramp rates can help reduce risk for consumers by ensuring that infrastructure is built as needed.

Regulators may wish to require that utilities incorporate the recommendations coming out of these groups:

- **NERC's Large Loads Task Force (LLTF) and Load Modelling Working Group (LMWG)**
- **Energy Systems Integration Group (ESIG)'s Large Load Working Group**
- **GridLab's draft report on Practical Guidance and Considerations for Large Load Interconnections**

State regulators may wish to require data centers to disclose this information to the utilities as part of the load application process and queuing system to increase public transparency and better understand the financial implications of new data center load on customers. While there are legitimate commercial concerns that need to be balanced, adoption of national or regional disclosure criteria could help avoid claims of commercial harm.

Require Utility to Provide Transparent Queuing Processes and Study Requirements

Another concern is that utilities typically do not have publicly accessible connection queues and rules for connecting new data center load. This means that regulators and the public generally have little insight into where and when data centers are seeking to connect. This dearth of information also affects potential data center developers, who lack insight into interconnection timelines and who else is seeking to connect to the grid in electrically similar locations.

Reforms might include requirements for utilities to provide a centralized, publicly accessible online resource where all large load connections are tracked. Project information might include date of request, location, size of load, type of load, in-service dates, application status. Standardized application processes with defined timelines and submittal requirements can improve uniformity in data collection and serve as an aid to applicants to better understand the process, reducing confusion and improving the quality of applications. Likewise, standardizing and documenting study processes would also increase transparency and certainty for developers and utilities.

The generator interconnection process likewise started as a series of bespoke rules that differed across utilities. The standardization of generator interconnection rules improved an opaque process and allowed for adoption of national requirements around requirements to demonstrate site control, post deposits, and other indicia of seriousness, all of which are lacking in today's load interconnection process. Federal and state regulators worked together to standardize the interconnection process, providing a model for federal-state collaboration.

LEVER #2

Clarify the Right of Utility Regulators to Tailor Rates to Data Centers

While there are many similarities between data centers and other large industrial loads, there are also critical differences that may warrant different rate treatment for data centers. These include the concentration of enormous electricity demand from a single industry, the speed at which data centers can be deployed, the ability to move certain types of data centers (particularly "mobile" data centers often used in the crypto sector) and the "always on" nature of data centers.[61]

Many energy regulators, including state public service commissions (and FERC itself), however, have struggled with the question of whether it is appropriate to establish specific tariffs for data centers and crypto mining operations. The organic statutes of most state utility regulators, require the commission to treat "similarly situated" customers on a comparable basis, and to adopt "just and reasonable" rates that do not "unduly discriminate" or "provide an undue preference" for individual customers.

Legislative or executive branch policymakers may wish to address the proverbial elephant in the data center and clarify that data centers can be treated as their own "rate class" for cost allocation purposes.[62]

Resolving this threshold issue has the potential to avoid extensive delays and litigation risk. For example, litigation before the Ohio Public Utilities Commission on this issue has been going on for more than a year.[63] There, parties[64] argued that AEP's proposed rates violated Ohio law prohibiting public utilities from charging rates that provide "undue or unreasonable preference or advantage" or from charging different charges for "a like and contemporaneous service under substantially the same circumstances and conditions."[65] In its reply comments, AEP Ohio argues that the proposed tariffs are not discriminatory because data centers have distinct characteristics "based upon some actual and measurable differences in the furnishing of services to the consumer."[66]

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61 As AEP Ohio recently highlighted that "data centers are unique because they increasingly form a large block of undiversified load that amplifies industry-specific risks. Unlike non-data center load, which consists of a diverse array of customers from various industries, the risks associated with data centers cannot be mitigated by marginal ups and downs of other industries." *See* Post-Hearing Reply Brief of Ohio Power Company, in Case No. 24-508-EL-ATA: *In the Matter of the Application of Ohio Power Company for New Tariffs Related To Data Centers and Mobile Data Centers*, at p. 8, *available at*: https://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A25D09B62744G00659.

62 A number of bills have been introduced, including those in New Jersey and Maryland, which could serve as a template for a model rule that could be adopted by any number of states. See Jersey Senate Bill 4307 (May 2025), available at: https://pub.njleg.gov/Bills/2024/S4500/4307_R1.HTM, and Maryland HB900 | 2025 | Regular Session., LegiScan, 2025, legiscan.com/MD/bill/HB900/2025.

63 The Ohio proceeding was initiated in May 2024 and is still undecided as of May 2025. For a more fulsome description on the litigation *see* Guest Blog: *Connecting Data Centers to the Grid: An Innovative and Controversial Proposal from AEP Ohio*, by Yoon Kim, (September 12, 2024), *available at*: https://blogs.law.columbia.edu/climatechange/2024/09/12/guest-blog-connecting-data-centers-to-the-grid-an-innovative-and-controversial-proposal-from-aep-ohio/.

64 *See, e.g.*, Comments of the Data Center Coalition and the Ohio Manufacturers Association, among others, in Docket No. 24-0508-EL-ATA, *available at:* https://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=04e50eca-8921-4481-a85b-ec9e016481a and fhttps://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=4be515bb-4252-4eab-9cbf-c0c28586510f.

65 *See* Ohio Revised Code (R.C.) 4905.35 and R.C. 4905.33.

66 *See* Post-Hearing Reply Brief of Ohio Power Company, filed in Case No. 24-508-EL-ATA on April 9, 2025, *available at:* https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=24-0508.

FERC recently rejected a proposal from Basin Electric Cooperative in Wyoming to establish a separate rate class for data center customers, citing concerns over undue discrimination. FERC stated that Basin has "not met its burden to demonstrate that its proposal to treat all Crypto Loads differently from non-crypto loads is just and reasonable and not unduly discriminatory or preferential." Instead, FERC rejected the Basin proposal, without prejudice and was "sympathetic to Basin's concerns regarding its ability to serve expected load growth reliably and economically."[67] A federal-state consensus on whether data centers are similarly situated to other large loads would go a long way to enabling more effective regulation of this new class of large energy user.

LEVER #3

Establish Substantive Requirements for New Requests

A number of state policymakers have taken the approach of requiring substantive commitments of new data center customers, particularly with an eye towards protecting customers against the risk of stranded transmission investment should there be a future downturn in the data center sector. Generally, these policies are designed to ensure that there is a long-term contractual relationship between the utility and the new data center customer to protect existing customers from bearing the costs of new transmission and generation investments if the data center subsequently leaves the system or reduces its usage.[68]

Key policy levers include requirements that new data center load:

- Enter into long-term contracts (i.e., 10 years or greater) with the utility for any new data center load to ensure that the data center contributes to the costs of new upgrades for at least that period of time.[69, 70]
- Sign "take-or-pay" contracts that require the data center customer to pay the utility for the amount of power requested in the initial application, even if the data center ends up leaving the system or using less total power than requested.[71]
- Post financial security to guarantee that the data center customers meet all of the

67 Basin Elec. Power Coop., 188 FERC ¶ 61,132 (2024).

68 Rules can be adopted administratively by state public service commissions, as has happened in Indiana and Ohio, or could be adopted into legislation, such as has been proposed (but not passed) in New Jersey. See Jersey Senate Bill 4307 (May 2025), available at: https://pub.njleg.gov/Bills/2024/S4500/4307_R1.HTM.

69 AEP initially proposed a contract term of 10 years, which is double the standard 5-year contract term required for traditional new loads. In its October 18 Stipulation, AEP proposed an initial ramp up period of four years, followed by a minimum 8-year contract. October 18 Stipulation at Section B.

70 In a settlement proceeding in Indiana Utility Regulatory Commission (CAUSE NO. 46097), parties agreed to provisions including: applicability to customers or 70MW or larger (150 MW in aggregate of multiple sites), minimum 12 year term, plus up to 5 years for ramp up of load, minimum monthly billing of 80% of commitment, notice requirements for changes, exit fee and other terms designed to protect Indiana Michigan Power Company customers.

71 *See* AEP Initial Filing in Docket No. 24-0508-EL-ATA, requiring prospective customers to provide a parent guarantee or collateral in the form of a letter of credit or cash equal to 50% of the customer's minimum monthly charges.

conditions imposed in the underlying agreement.[72]

- Aggregate all data center developments by the same or affiliated companies to ensure that data center developers are not sizing facilities to avoid or minimize the posting of financial security or otherwise undermining the intent of the rules.[73]
- Enter into a "construction services agreement" to ensure reimbursement of any infrastructure costs incurred by the utility if the prospective data center customer cancels its service request prior to taking the new service (i.e., to cover expenditures made between the initial request and when service starts with a take-or-pay contract).[74]
- Require data centers to demonstrate that they own the land on which any proposed data center will be built (either through an appropriate options agreement, ownership in fee-simple or similar requirement).
- Require prospective data center operators to provide evidence that it already has customers lined up to use the data center, whether in the form of binding contracts or evidence of other types of customer commitment (i.e., "commitment-backed" contracts).[75]
- Provide advantages for data center customers that agree to provide demand flexibility or otherwise reduce load, such as reduced collateral posting requirements or shorter contract terms.[76]
- Require an exit fee for projects if their project is canceled or unable to meet the obligations outlined in the underlying electric service agreement.[77]
- Impose a moratorium on new data center connections while rules are established.[78]

While these provisions can be controversial, there have been several instances – most recently in Indiana – where prospective data center developers have supported some substantive

72 According to Google, "up-front financial commitments … create[s] "skin in the game" by requiring sponsors of projects with a large minimum peak demand to post a material financial commitment … This effectively mitigates the equally significant risks of over development of infrastructure and potential stranded costs and under investment in critical infrastructure to accommodate these important sources of economic growth. Material up-front financial commitments can reduce speculative or duplicative load requests that may be adding uncertainty to load forecast estimates." Post-Technical Comments of Google LLC in FERC Docket No. AD24-11-000 (Dec. 2024).

73 *See* AEP Ohio Stipulation, October 18, 2025 at A.5 ("All new load of affiliated companies and companies with common ownership will be considered in the aggregate for purposes of calculating the minimum demand charge that will be included for the full term of each ESA for new projects under this tariff."

74 *See* October 18 Stipulation, requiring customers to "reimburse AEP Ohio for 100% of its buildout costs to serve the customer (including *local* transmission upgrades but excluding *regional* transmission upgrades such as a new 765 kV line) if the customer cancels or delays its project (by more than 12 months) prior to the target energization date; once the project is completed and service is energized to the customer, the LOA obligation covering 100% of the buildout costs will expire.")

75 Google proposed "new large load interconnections to be "commitment-backed" through material, up-front financial commitments," calling it a "a proactive approach to load forecasting that standardizes the processes for verifying large load additions before inclusion in RTO load forecasts, thereby protecting ratepayers from overbuilding the system on the basis of duplicative or speculative load requests." Post-Technical Comments of Google LLC in FERC Docket No. AD24-11-000 (Dec. 2024).

76 AEP's October 18 Stipulation proposed to "explore potential solutions to alleviating transmission constraints" by providing customers a "one-time opportunity … to reduce their existing Contract Capacity provided: (1) doing so does not create a stranded asset related to plant-in-service that was installed to serve the customer's larger load request, and (2) the customer agrees not to request additional capacity at that location for three years after the reduction absent a demonstrated change in circumstances." *See* October 18 Stipulation at Section H.

77 AEP Ohio proposed an exit fee equal to 3 years' worth of payments.

78 In March 2023, AEP Ohio placed a temporary moratorium on taking new data center service requests in order to address large transmission system upgrade issues (due to high financial commitment and length of time needed to construct).

requirements. AEP's Indiana affiliate, the Indiana Office of Utility Consumer Counselor, Amazon Web Services (AWS), Microsoft, Google, the Data Center Coalition (an industry trade association), and the Citizens Action Coalition (a ratepayer advocacy group), for example, are all signatories to the new data center tariff approved by the Indiana Utility Regulatory Commission, which included many of these substantive provisions.[79]

Require Contribution to Grid Modernization Funds to Provide Ratepayer Relief for Costly Transmission Needed for Data Centers

One of the challenges of the modern data center revolution is that the costs of the new transmission needed to serve data centers are, at least initially, socialized across all users of the system. Data centers often do not begin significantly contributing to pay for the fixed cost of operating the transmission grid for several years after construction starts. While a successful data center will eventually ramp up and contribute to paying the fixed costs of the utility system, the revenues often lag the rate increases to pay for the transmission upgrades that must be built in advance of the load commencing operation. The result is higher rates for all customers during the ramp-up period, with the promise of additional contributions to utility revenue requirements in the future.

This leads to the uncomfortable sensation that mom & pop energy consumers are cross-subsidizing large, multi-national data center customers. While reality is of course more complicated than this, there is no question that transmission expansion for data center needs is putting significant upward pressure on transmission rates.[80] Smoothing this asymmetry between when costs are incurred and benefits start appearing is one potential option for addressing affordability and equity concerns. Regulators could mandate, for example, that utilities require data centers to pay a "grid modernization" or "ratepayer relief" fee in order to connect to the grid.

One such fund was agreed to as part of a settlement in Indiana over data center tariff rules, where "Amazon, Microsoft, and Google each agree that, no later than six months after their respective service energization [to] provide $500,000 per year for a period of five years to Indiana Community Action Association ("INCAA") to support income qualified customers in Indiana, including supporting health and safety to enhance weatherization opportunities."[81] While this fund was established as part of a settlement agreement with specific parties, other states may wish to incorporate these types of requirements as a condition on future data center operators as well.

The rationale is that such a fund would provide immediate relief for ratepayers seeing

79 *See* "Stipulation and Settlement Agreement," *In the Matter of the Verified Petition of Indiana Michigan Power Company for Approval of Modifications to its Industrial Power Tariff*, Cause No. 46097, before the Indiana Utility Regulatory Commission, November 22, 2024 ("Indiana November 2024 Settlement").

80 *See, e.g.,* Pre-Conference Testimony of Dr. Joseph Bowring, Independent Market Monitor for PJM in Docket No. AD25-7-000, at p.3 ("Large data center load additions have already had a significant impact and will have additional significant impacts on other customers as a result of required transmission upgrades and higher capacity market prices, regardless of the details of interconnection.")

81 *See* Indiana November 2024 Settlement, at p. 9.

increased transmission bills and allow utilities to use data center funding to offset the cost of longer-term planning and grid expansion. Any grid modernization fund could be structured to support other state energy policies, such as funding deployment of Grid Enhancing Technologies/Advanced Transmission Technologies,[82] upgrades for transmission-constrained areas, or similar grid modernization initiatives.

Prospective data center operators could also be asked to fund additional research into data center operations, with a special emphasis on energy efficiency. For example, there have been significant improvements in the power usage effectiveness of data centers in the past, but more recent efforts have focused on performance as the major players compete to establish their position in the market. There is, however, still room for improvement in the IT infrastructure, cooling systems, and auxiliary functions. Much like states encourage developers of emerging technologies to support local research and development, as well as workforce development, similar incentives could be implemented.

The idea that grid upgrades should be funded by the party that benefits from those upgrades is commonplace in generator interconnection. However, load has historically been treated differently. Advance funding of transmission upgrades has been implemented on the generator interconnection side in a number of select cases.[83] While these shared transmission facilities have typically been focused on connecting new generation infrastructure, requiring an up-front grid modernization fund could help state regulators fund new transmission while avoiding the criticism that retail customers are paying for large transmission infrastructure needed for data centers.

Require Flexibility in Data Center Operations

Traditionally, the utility service compact is that a utility has the obligation to serve all customers on a 24-hour a day and 365 day a year basis. In exchange for that commitment, the utility can earn a guaranteed rate of return on its capital investment through regulated cost of service filings. This model is premised on the utility making the necessary investments to provide all customers with round-the-clock and highly reliable service. Because grid infrastructure must

In Indiana, the utility and major data center operators agreed to "convene a meeting, and more if needed, of the Settling Parties to discuss 1) the Company's emergency response procedures, including required system actions that would be necessary to respond to an emergency load shedding event required by PJM that is caused by deficiencies in either transmission and/or generation capacity and consider the potential need to modify such procedures due to the Large Load Customers; and 2) existing and potential demand response opportunities for Large Load Customers.

82 The Indiana Settlement also included provisions for the studying of Grid Enhancing Technologies, which Indiana has been a leader in exploring. *See* Indiana November 2024 Settlement, at p. 8.

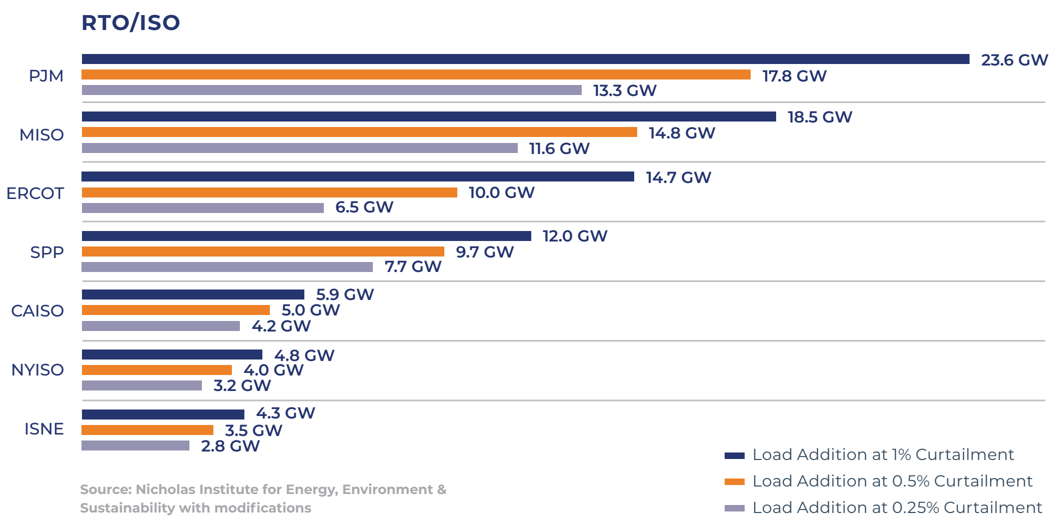
83 These include proactive transmission upgrades to connect renewables-rich regions to load centers, including the Tehachapi Renewable Transmission Project in California, the Competitive Renewable Energy Zones ("CREZ") in ERCOT, and shared State Agreement Approach offshore wind transmission infrastructure in New Jersey, among others.

be sized to meet the peak load of the system, the result can be significant investments to accommodate conditions that might only be present for a limited number of hours of the year, but nonetheless are required to maintain the standard level of reliability.

One potential money-saving scenario is for data center customers to accept a lower level of reliability during a few hours per year in exchange for lower rates.[84] Research suggests that curtailment of data center operations during a few critical hours each year could significantly decrease the amount of necessary infrastructure investment.[85] Interruptible rates and demand response are variations on this concept that can mitigate the need for or reduce the amount of grid investment. As Amory Lovins puts it, "[i]n the near term, smarter grid strategies can support data center growth without overbuilding. These include improving demand flexibility, enabling other users' efficiency gains, and co-locating new data centers with clean energy at underused gas plants. Just those "Power Couples," combining clean supply with flexible demand, can deliver fast, cheap, clean, reliable power to support AI progress on a solid foundation."[86]

While many data center operators are reluctant to commit flexible operations, regulators may wish to require grid flexibility, where appropriate,[87] or prioritize connections or charge lower rates for data centers willing to shift their usage.

System Headroom Enabled by Load Curtailment of New Load by Balancing Authority, GW



Source: Nicholas Institute for Energy, Environment & Sustainability with modifications

84 Likewise, customers wishing to have a higher level of service availability can sometimes choose to pay for additional supply paths, depending on what the individual utility might offer, or they can invest in their own backup resources to meet their unique requirements.

85 One study suggests that 76 GW of new load-equivalent to 10% of the nation's load current aggregate peak demand-could be integrated with an average annual load curtailment rate of 0.25% (i.e. if new loads can be curtailed for 0.25% of their maximum uptime. *Rethinking Load Growth: Assessing the Potential for Integration of Large Flexible Loads in US Power Systems,* Nicholas Institute, Duke University, Tyler Norris, *et al.* March 2025, *available at:* https://nicholasinstitute.duke.edu/publications/rethinking-load-growth.

86 *Lovins*, at p. 1.

87 Some types of digital data services are more flexible than others. Training of large language models, for example, may be an excellent candidate for curtailment during times of grid stress, whereas data centers serving first responders, national security or other needs may be less able to shift usage.

Pending legislation in New Jersey would also allow the state's utility commission to "relax" a series of substantive requirements on data centers "if a large load data center commits to providing sufficient operational flexibility or commits to bringing additional sources of energy and capacity online to meet its load, such that [collateral posting and other] requirements are not necessary to protect ratepayers.[88]

Some data centers may be able to move computing tasks to different times of the day or even geographic areas to reduce flows on transmission or distribution facilities that would otherwise be overloaded and need to be upgraded. Further, most data centers have large back up generation (diesel generation, etc.) that can be used to provide flexibility, but may be subject to air emissions and political considerations.[89]

Develop New "Non-Firm" Tariff Services

Fully realizing the value of flexible operations will necessitate changes to the applicable tariffs and operations and planning processes to recognize the non-firmness of the data center load, or portion of load, so as not to conflict with mandatory reliability standards.

One mechanism for accomplishing this would be for state policymakers to work in collaboration with FERC, grid operators and utilities to develop and implement "non-firm" transmission service or "interruptible tariffs" for data centers to incentivize flexible operation. Non-firm transmission service allows utilities to curtail service to large load customers during times of stress on the system. States can already do this at the distribution level, but would need to work with federal counterparts to implement non-firm service on the transmission grid.

In exchange, utilities could allow data center customers to commence operations sooner than under a traditional system. With traditional firm transmission service, the utility generally cannot allow a new customer to start taking service until all upgrades are complete. However, if a non-firm customer agrees to come off the system when needed for reliability, the utility may be able to connect them sooner. Additionally, transmission customers typically get access to less expensive transmission service, creating a win-win for large customers and utility ratepayers.

Example #1

California's Pacific Gas & Electric Flex Connect pilot offers a more rapid path to interconnection for data centers that can commit to using their own back-up generation in lieu of grid service when needed over specific peak hours in the summer.[90]

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88 New Jersey Senate Bill 4307 (May 2025), *available at:* https://pub.njleg.gov/Bills/2024/S4500/4307_R1.HTM.

89 One concern is that policymakers do not inadvertently encourage excessive operation of backup diesel generators in exchange for additional flexibility. One opportunity to mitigate these impacts is to also incentivize investment in non-diesel back-up generation (e.g., natural gas fuel cells or linear generators) or encourage the use of cleaner fuels, such as biogas, green ammonia, propane or other fuels that have a lower emissions profile than diesel.

90 For background on PGE's program, *see* https://www.pge.com/assets/pge/docs/clean-energy/electric-vehicles/flexible-service-connection-pilot-overview.pdf. *See also* Post-Technical Conference Comments of Vincent Duane Princial, Copper Monarch LLC, under AD24-11-000 (Dec. 9, 2024).

Example #2

In Oregon, Portland General Electric's "Schedule 200: Dispatchable Standby Generation" program allows data centers to operate on an interruptible tariff. The program allows large nonresidential customers to contract with PGE to provide grid services using their own generation resources, such as internal combustion generators or battery energy storage systems. The program aims to enhance grid reliability by enabling PGE to dispatch these customer-owned resources during times of high demand or potential power quality issues.[91]

Impose "Bring Your Own" Energy or Capacity Requirements

The rapid growth of data center electricity demand is contributing to significant increases in customer costs, particularly through higher capacity market prices. In many cases, there is not enough new generation coming online to meet this new demand. As a result, utilities and load-serving entities are forced to rely on existing clean energy resources to serve the new load.

To mitigate these impacts, states could require additional generation to be secured before interconnection is permitted, or within a defined timeframe. These "Bring Your Own" requirements could ensure that data centers contribute new resources instead of solely relying on the existing generation, which has been the most common practice.

There are multiple ways that states can and have imposed requirements that mitigate some of the challenges from new load showing up faster than new generation:

- Although it failed to pass, Maryland HB 905 would have made qualified data centers eligible for sales and use tax exemptions only if they incorporate onsite solar, procure at least 15% of their energy from Maryland offshore wind via long-term contracts, or purchase Maryland solar renewable energy credits.[92]
- Similarly, Virginia HB 116 ties a sales tax exemption to decarbonization among other thresholds, making data centers eligible if they are 90% carbon-free by 2027, make a minimum of $35 million capital investment, and create at least 1,000 jobs by 2040.[93]
- Google & Nevada Energy agreed to a "Clean Transition Tariff" (CTT), which allowed Nevada Energy (NV Energy) to contract with Fervo, a geothermal generator and pass the clean power through to Google. Under this CTT, the energy customer would agree to pay a premium over grid-sourced energy equal to the difference between the cost of a new clean energy resource and the "but-for" system mix that NV Energy would have deployed under regulatory least-cost constraints. Here, the customer must agree to the contractual provision designed to ensure that NV Energy's other customers would not end up paying any portion of the new contract, even if the resource does not produce

91 *See* Oregon Public Utility Commission, Docket No: ADV 1705 (filed Feb. 2025), *available at:* https://apps.puc.state.or.us/edockets/docket.asp?DocketID=24439.

92 "Maryland HB905 | 2024 | Regular Session." *LegiScan*, 2024, legiscan.com/MD/text/HB905/id/2913723.

93 "Virginia HB116 | 2025 | Regular Session." *LegiScan*, 2025, legiscan.com/VA/supplement/HB116/id/480293.

the expected amount of energy or the customer consumers less energy than expected.[94]

- Alternatively, there are other creative solutions that mitigate this problem, like a unique public-private partnership between Meta and Entergy in Louisiana. Here, Meta is developing a $10 billion hyperscale data center and Entergy plans to build three new combined cycle plants and over 100 miles of new transmissions. However, Entergy has asserted that Meta's financial contribution will generate long-term cost savings for other customers.[95]
- Lastly, states may allow isolated microgrids to serve data center load directly, or they may temporarily delay new interconnections until capacity prices stabilize.

Set Clean Energy Content Requirements: the BeYOnCE Concept

States generally have jurisdiction over end-use electricity usage and can impose clean energy requirements on data centers, including those operating behind-the-meter, co-locating with existing generation, or operating in islanded energy parks. States have long applied clean energy content requirements uniformly across customer classes policies, such as Renewable Portfolio Standards (RPS) or Clean Energy Standards (CES).[96]

However, there is significant concern that requiring data centers to purchase clean energy is driving them to focus on buying electricity from *already existing* sources of carbon-free electricity without adding any "additional" clean energy. Nuclear units have proven particularly attractive for data center operators, since they have the 24/7 operational profile data centers need and provide a ready-made source of zero-emissions energy.

This "shuffling" of resources, in which clean generation is redirected from existing customers to new ones does less to contribute to state emission reduction goals than requiring new or "additional" sources of clean energy. Several states have recently considered requiring new data center customers to bring new clean energy resources online in sufficient quantities to supply new data centers, a program often referred to as the "Bring Your Own Clean Energy" or "BeYOnCE" concept.[97]

Vertically integrated utilities have also used data center tariffs as a means of accelerating deployment of clean energy transition tariffs, such as the agreement in the Indiana proceeding to "work collaboratively with the Settling Parties to develop a new customer program tariff proposal that enables participants to support investment in carbon-free resources while ensuring that all program costs are covered by program participants[.]"[98]

94 *Kobor, Briana.* "Our First-of-Its-Kind Partnership for Clean Energy Has Been Approved in Nevada." *Google* (May 2025), *available at:* blog.google/feed/nevada-clean-energy/.

95 *Scardigli, Brandon.* "Entergy Louisiana to Power Meta's Data Center in Richland Parish." Entergynewsroom.com, 2024, www.entergynewsroom.com/news/entergy-louisiana-power-meta-s-data-center-in-richland-parish/.

96 Virginia's Clean Economy Act, for example, mandates 100% clean electricity by 2045 for Dominion Energy and by 2050 for Appalachian Power. Virginia is, of course, home to the largest concentration of data centers in the world. *The Virginia Clean Economy Act (VCEA).*

97 The exact origins of the BEYONCE moniker may never be known. Rob Gramlich of Grid Strategies introduced the term to authors, although Robbie Orvis of Energy Innovation also appears to have been an early proponent.

98 Indiana November 2024 Settlement Agreement, at p. 6.

LEVER #4

The "M" Word: Moratorium

In some states, rapid data center growth has outpaced infrastructure and planning processes and has occasionally prompted regulators to temporarily halt new data center developments or incentives. These moratoria can allow for time to assess the long-term impacts on the grid or evaluate the total system costs. Furthermore, they can allow regulators to revise permitting or zoning rules before proceeding with new data center approvals and developments. However, moratoria can also be very unpopular with data center operators and for policymakers seeking to reap economic development and tax benefits from data centers.

- Virginia's Loudoun County, for example, removed "by-right" zoning for data centers, which required board review for all new data center proposals.[99] The state legislature has also launched a formal study of data center impacts on the grid and communities.[100]
- Though ultimately vetoed by the Governor, the Georgia House and Senate passed a bill that included a two-year moratorium on data center tax incentives to give the state time to evaluate how rising electricity demand from large-scale development could affect reliability and future capacity.[101]
- In Indiana, clean energy and consumer groups have called for a pause on new hyperscale data centers, after projections showed the sector could consume more power than the state's entire residential demand within a decade.[102]
- The city of Amsterdam announced in April 2025 that it would no longer allow new data centers or expansions within its borders. Projects submitted before December 28, 2023, or already in advanced negotiations are exempt. The city plans to revisit this policy in 2030.[103]
- In 2022, EirGrid, Ireland's state-owned electric power transmission operator, announced it would not consider new data center applications in the Dublin region until 2028 due to grid constraints and the high energy consumption of existing centers.[104] Data centers accounted for 21% of Ireland's electricity usage in 2023.[105]
- Frankfurt, a major data center hub, designated zones for data center development and enhanced sustainability requirements.[106]

99 *Turner, Mike. Loudoun County, Virginia: Data Center Capital of the World: "a Strategy for a Changing Paradigm."* 1 Apr. 2025.

100 "JLARC Report: Data Centers in Virginia | Cooper Center." Coopercenter.org, 9 Dec. 2024, www.coopercenter.org/research/jlarc-report-data-centers-virginia.

101 "Georgia General Assembly." Ga.gov, 2025, www.legis.ga.gov/legislation/66812.

102 *Lydersen, Kari*. "Indiana Advocates Press for Data Center Pause amid Rising Energy Demand." *Canary Media*, canarymedia, 17 Feb. 2025, www.canarymedia.com/articles/policy-regulation/indiana-advocates-press-for-data-center-pause-amid-rising-energy-demand.

103 NL Times. (2025, April 18). *Amsterdam no longer allowing data centers in the municipality*. NL Times. https://nltimes.nl/2025/04/18/amsterdam-allowing-data-centers-municipality

104 RTÉ News. (2022, January 10). *EirGrid will not consider new Dublin data centres until 2028*. RTÉ. https://www.rte.ie/news/dublin/2022/0110/1272869-eirgrid-datacentres-dublin

105 Associated Press. (2023, November 15). *Data centers used 21% of Ireland's electricity last year. Critics say it's too much.* AP News. https://apnews.com/article/6c0d63cbda3df740cd9bf2829ad62058

106 DLA Piper. (2022, July 4). *Update on Frankfurt data centre masterplan*. DLA Piper. https://www.dlapiper.com/en/insights/publications/2022/07/update-on-frankfurt-data-centre-masterplan DLA Piper. (2022, July 4). *Update on Frankfurt data centre masterplan*. DLA Piper. https://www.dlapiper.com/en/insights/publications/2022/07/update-on-frankfurt-data-centre-masterplan

- Singapore imposed a moratorium on new data center developments from 2019 to 2022, but has since allowed limited (80 MW) new data center capacity, emphasizing sustainable growth and energy efficiency.[107]

Policy Option	Description
LEVER #1 **Improve Administrative Collect Information Collection & Improve Processing of Data Center Requests for New Service**	
Address Double Counting of Requests	Implement rules, similar to Texas Senate Bill No. 6, which would require data centers to disclose multiple service requests to avoid duplication in utility load forecasts.
Refine Load Forecasting	Refine load forecasting to consider the potential of load growth, recognizing high- and low-probability data center expansions and incorporating requirements such as requiring site control, customer commitments, and up-front deposits to support load forecasts.
Enhance Data Collection	Require data centers to provide comprehensive information in their load application, such as energy usage patterns, load ramp projection, and capability/willingness to curtail usage when the power grid is experiencing stress.
Reform Utility Queuing Processes for Large Load Connections	Create publicly accessible load connection queues and standardized study processes, enhancing transparency and regulatory oversight.
LEVER #2 **Clarify the Right of Utility Regulators to Allow PSCs to Tailor Rates to Data Centers**	
Clarify PSC's role in Establishing Utility Rates for Data Centers	Clarify that Public Service Commissions (PSCs) can establish specific tariffs for data centers, recognizing their unique operational characteristics and impacts to the power grid and other system users.
LEVER #3 **Establish Substantive Requirements for New Data Center Requests**	
Establish financial commitments for New Data Center Requests	Require financial commitments from data centers to protect against stranded transmission investments, ensuring financial accountability. Commitments might include; minimum contract term, security deposits, minimum billing, notice requirements, exit fees, and other terms tailored the state regulatory needs.
Require Contribution to Grid Modernization Funds	Require data centers contribute to a grid modernization fund to provide ratepayer relief for necessary transmission investment. Fund could be structured to support other state energy policies, such as the deployment of Advanced Transmission Technologies or similar grid modernization initiatives.
Require Flexibility in Data Center Operations	Encourage utilities and regional grid operators to develop and implement flexible tariff rates or interruptible rates that will offer incentives for flexible operations. More flexible operations can avoid or delay transmission investments and aid operators during period of grid stress.

107 Data Center Knowledge. (2022, July 20). *Singapore ends data center pause as it seeks sustainable growth*. https://www.datacenterknowledge.com/cooling/singapore-ends-data-center-pause-as-it-seeks-sustainable-growth

Policy Option	Description
Require Data Center Developers to Fund Research to Enhance Energy Efficiency	Require data Centers to fund or contribute to R&D to enhance the operational efficiency of the data centers and reduce future loading on the grid as the industry continues to expand.
Set Clean Energy Content Requirements	Establish and/or strengthen state decarbonization goals by setting clean energy content requirements that apply uniformly across customer classes, including data centers.
Impose "Bring Your Own" Energy or Capacity Requirements	Require data centers to secure additional generation commitments by a set timeline in order for the new load to be connected and supplied.

LEVER #4

Impose temporary restrictions or controls on data center expansion

Impose a Moratorium	Impose temporary restrictions or controls on data center expansion to manage impacts of large load additions on electrical infrastructure.

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