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Managing large loads: How policymakers can get ahead of the data center boom

Introduction

A wave of large new electricity demand has reshaped the energy debate across the country, and this time it is being led by large loads. While no widely accepted threshold exists, large loads are often characterized as singular demand point over 10-100 MW. Data centers are the clearest example, but they are not the only one. Large electrified industrial facilities may also fit the definition of large loads but are typically much more sensitive to electricity prices than data centers and come with different land, air quality, and water impacts, and other features. These projects can bring benefits to host communities: tax revenue, construction jobs, and long-term development. They also bring economic and environmental risks that utilities, regulators, and lawmakers should not treat as routine. Put simply, data centers and other very large electricity users can change the economics of the grid for everyone.

One challenge is that no one really knows how much of the projected demand from large loads will show up, how quickly, or for how long. Some announced projects will be built as planned. Others will be delayed, downsized, or canceled. Data center efficiency is changing too, and technology advancements could alter how much electricity a facility actually needs over time. Yet utilities and grid planners are being asked to make long-lived infrastructure decisions based on uncertain forecasts that may look very different in five or ten years.

That uncertainty creates a challenge. If the load materializes, the grid will need major new generation, transmission, and distribution of investments today to unlock economic development opportunities in the future. If it does not, utilities making investments today may be left trying to recover the cost of infrastructure built for customers that never fully arrived. Either way, there is risk. Without proactive policy, it is far too easy for that risk to fall on residential and small business customers rather than on the large loads that trigger the investment.

Goals that proactive large load policies seek to accomplish

Large load policy will vary in specifics, but generally seeks to accomplish at least the following:

- **Protect regular ratepayers from subsidizing new large loads, like data centers.** Residential and small business ratepayers shouldn't bear the cost of infrastructure built primarily to serve a handful of massive new customers.
- **Protect utilities and ratepayers from unanticipated demand declines.** If a large load doesn't materialize as forecast, or exits earlier than planned, the risk shouldn't fall on remaining customers.
- **Guide new large loads toward locations that make sense for the system.** A data center's location has significant implications for how much new transmission and generation capacity is required to serve it.
- **Incentivize load to be flexible about when they use power.** If a large facility can power down or shift its usage during the times the grid is most stressed, it could require less new infrastructure overall. Encouraging that kind of flexibility also can help with grid reliability and cost.
- **Incentivize large loads to be supplied with clean power.** Given the scale of new demand involved, how these loads are powered has a meaningful effect on overall grid emissions.
- **Ensure transparency around broader impacts.** Land use, water consumption, and air quality effects associated with large loads deserve public visibility, not just the electricity cost implications.

These goals are basic guardrails. But they do not appear automatically through ordinary utility ratemaking, especially when projects are moving quickly and the pressure to secure economic development is high.

The primary policy lever: large load tariffs

For many states, the most direct place to start is a large load tariff: a rate structure for very large new customers that is separate from ordinary commercial and industrial rates. The details vary by state, but the core purpose is to make sure the customers driving new costs are the ones responsible for them. In practice, the strongest tariffs tend to include common categories of protections:

- **Make the big customer pay for the equipment built just for them.** Tariffs typically require large loads to bear the costs of the specific infrastructure built to serve them, though the definition of "large" and exact methodology varies significantly by jurisdiction.
- **Minimum contract lengths.** Long minimum contract terms help ensure that infrastructure investments made to serve a large load get paid down over a timeframe that matches the useful life of that infrastructure, rather than leaving costs stranded if the customer exits early.
- **Require payment for a guaranteed minimum amount of power, even if less is used**. Also known as take-or-pay obligations, these require large loads to pay for a minimum level of service regardless of actual usage. This protects utilities and other ratepayers against the risk of demand coming in lower than forecast.
- **Require an upfront deposit or financial guarantee.** Requiring large loads to post financial security helps ensure that if a project falls through, the utility and its other customers aren't left absorbing sunk infrastructure costs.
- **Ongoing financial assurance and credit requirements.** Beyond initial collateral, some tariffs require continued demonstration of creditworthiness over the life of the contract.
- **Charge a fee for leaving early**. These exit fees discourage large loads from signing up for service, prompting significant infrastructure investment, and then leaving early, sticking remaining customers with the bill.
- **Clearly define interconnection study timelines.** Clear, predictable timelines for how long interconnection studies will take give both utilities and large load customers more certainty for planning purposes.
- **Public interconnection queue transparency.** Making queue status visible helps other developers, regulators, and the public understand system capacity and avoid duplicative or speculative requests clogging the process.
- **Upfront fees for transmission and distribution (T&D) upgrades.** Requiring large loads to help fund needed T&D upgrades up front, rather than after the fact, better aligns cost timing with cost causation.
- **Incentivize large loads to be flexible.** Tariffs can credit large loads that agree to curtail consumption during tight system conditions and thereby reduce the need for new generation or network capacity. These incentives should be tied to verifiable and enforceable curtailment obligations with meaningful penalties for non-performance.
- **Give large load customers a way to request and procure clean energy.** Some tariff structures let large loads opt into, or directly procure, clean generation to serve their load.
- **Set clear rules for customers who want to build their own power.** Set rules governing whether and how large loads can build their own generation or transmission, rather than relying entirely on utility-provided infrastructure.
- **Clean energy procurement mandates.** Some jurisdictions go further than opt-in mechanisms and require large loads to meet a defined clean energy procurement standard.
- **Water use requirements.** Given the water intensity of certain data center cooling technologies, some tariffs or accompanying regulations address water use directly.
- **Disclosure requirements.** Requiring large loads to disclose relevant information, including energy use, water use, and emissions profile, supports the broader transparency goal and gives regulators and the public the information needed for informed decision-making.

The right set of policies depends on the local market structure, the utility system, and the size and pace of the load requests. But the general trend across the country is clear: regulators are moving away from

treating large load customers as ordinary commercial load and toward rules that recognize the scale of the system commitments they require.

Expanding the solution set beyond rate design

Tariffs matter, but they are not the whole answer. If the goal is to serve new demand without overbuilding the system or shifting costs to everyone else, policymakers can also look at systemic near- and long-term strategies that make the existing grid work harder and smarter (Figure 1).

Solutions		Regulators	Utilities	Grid planners/ operators	Governors and Legislators	Others
Maximize the Value of the Existing Power System	A. Enable distributed and demand-side resources	✓	✓	✓		Third-party DER aggregators
	B. Enhance rate options	✓	✓		✓	
	C. Utilize GETs, ATTs, and RASs	✓	✓	✓	✓	
	D. Capitalize on transmission upsizing opportunities	✓	✓	✓		
	E. Facilitate interregional trade			✓	✓	
Cost-Effectively Accelerate the Grid Connection of New Loads	A. Enable customer-sponsored generation	✓	✓	✓	✓	
	B. Co-locate new generation and load	✓	✓	✓	✓	Energy park developers
	C. Streamline generator interconnection processes	✓	✓	✓		Transmission owners
Implement Proactive Planning and Procurement Processes to Accelerate the Necessary Investments	A. Proactively plan generation and transmission	✓	✓	✓	✓	Power procurement authorities; State energy offices
	B. Reform generator procurement processes	✓	✓	✓	✓	Power procurement authorities; State energy offices
	C. Proactively plan distribution systems	✓	✓			
	D. Improve load interconnection processes	✓	✓		✓	State energy offices
Introduce Targeted Affordability Measures	A. Offer energy efficiency and bill assistance	✓	✓		✓	State energy offices
	B. Implement specialized rates for new large loads	✓	✓		✓	
	C. Explore alternative financing	✓	✓		✓	Private developers

Figure 1. Summary of solutions and stakeholder actions as presented in The Brattle Group paper. Acronyms used here include grid-enhancing technologies (GET), alternative (advanced) transmission technologies (ATTs), and remedial action schemes (RASs).

As an example, planners can squeeze more out of the grid we already have, before building new generation and transmission. Rather than defaulting straight to new transmission and generation buildout, utilities and planners could be required to formally evaluate grid-enhancing technologies (GETs), advanced transmission technologies (ATT), virtual power plants (VPPs), and storage in order to unlock existing grid capacity at a fraction of the cost and timeline of new infrastructure.

More ambitious proposals exist as well, such as requiring data centers to pay fees into a dedicated fund to support clean energy infrastructure tied to large load growth. A large load fund – capitalized by fees or contributions from large load customers themselves – can help finance the clean generation and transmission infrastructure needed to serve new demand without shifting that cost burden onto other

ratepayers. Whether or not such a policy is suitable for a state will depend on the set of conditions and regulations that influence their local development.

Getting ahead of the problem

States that set the rules early will be in a better position to capture the benefits of growth without accepting unnecessary affordability, reliability, and sustainability risks. For state policy leaders, the question to start with is simple: Does your state already have a large load tariff? And if so, does it make big customers pay their share of costs, require financial guarantees, and encourage clean power? If the answer is “no,” or “only partly,” states will need to assess their risks now, before the next wave of data center projects turns into costs that can't be undone.