CLIMATE CABINET EDUCATION

Taming Data Center Turmoil: The Rise of the Hyperscalers

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Introduction

This is the first paper in our five-part series "Taming Data Center Turmoil: A Regulatory Framework to Meet Today's Challenges." Click here for more information and to read the whole series.

For most of the past century, electricity demand grew predictably. Utilities could plan for gradual increases across homes, offices, and factories with high confidence. Traditional growth was steady, measured in single-digit annual percentages, and closely linked to local economies.

Hyperscale energy loads (data centers, cloud facilities), however, are rewriting this rulebook. A single facility can consume as much power as 100,000 homes, and clusters of centers can add multiple gigawatts of concentrated, rapid, and globally mobile demand within just a few years. **Unlike traditional industries, these facilities can appear almost overnight, challenging the slow, predictable pace of electricity planning.**

Hyperscale Data Centers: Scale, Speed, and Concentration

Hyperscale data centers differ fundamentally from traditional industrial or commercial loads. Their defining characteristics create new challenges for utilities and policymakers:

SCALE

Individual hyperscale projects can rival or exceed historic annual increases in total system demand. For example, the Stargate Data Center's planned 1.2 gigawatts of demand is equivalent to the power need of a mid-sized U.S. city, like Austin or Jacksonville. Such concentrated demand challenges decades-long planning assumptions and could require major upgrades to transmission and distribution infrastructure.

SPEED

Hyperscale load can materialize in months, much faster than the timelines required to build generation or transmission, or to obtain permitting. Utilities that rely on decades-long planning may face costly mismatches between infrastructure readiness and actual demand.

CONCENTRATION

Facilities often cluster in specific areas, intensifying local grid impacts. Unlike traditional industrial development, which is spread out and gradual, clustered hyperscale loads can stress local capacity, increasing the risk of stranded infrastructure if projects relocate or scale down.

Photo credit: Bloomberg

Global Mobility and Policy Implications

Hyperscale operators choose locations based on access to power, permitting certainty, and speed to market—not local labor or customer proximity. Hyperscale data centers are interchangeable nodes in a global network, unlike traditional industries, which are anchors of local economies. For example, as of early 2026, Amazon Web Services operates infrastructure across 39 regions worldwide and can expand rapidly in locations that meet power and permitting requirements. Consequently, state-level energy policy decisions today may lock in infrastructure and costs for decades, even if individual facilities relocate or scale down.

This creates a new policy challenge: **how to accommodate rapidly scaling, concentrated, and globally mobile loads without exposing ratepayers to stranded asset costs, excessive risk, or reduced system flexibility.**

TABLE 1. HOW HYPERSCALE LOAD DIFFERS FROM TRADITIONAL INDUSTRY

FEATURE	TRADITIONAL INDUSTRY	HYPERSCALE DATA CENTER
Scale	Gradual system growth	Comparable to a mid-sized city
Speed	Years to decades	Months
Concentration	Spread across the region	Local clusters with high grid impact
Mobility	Tied to the local economy	Globally mobile

Hyperscale Load Scenarios

Rapid growth in hyperscale electricity demand creates both economic opportunity and significant uncertainty for utilities and regulators. Two important considerations determine the range of potential outcomes for grid stability and utility economics: **who ultimately bears the cost of the infrastructure required to support new load, and whether the projected demand actually materializes and remains operational over time.**

Depending on how these factors unfold, the financial risks and benefits of new investment may fall primarily on the hyperscale customers driving demand, on utilities and their broader ratepayer base, or on both. The table below illustrates how different combinations of cost responsibility and facility realization could shape outcomes for utilities, ratepayers, and customers.

TABLE 2. HYPERSCALE LOAD SCENARIOS

HYPERSCALE LOAD OUTCOME	HYPERSCALER BEARS COSTS	SHARED COSTS	RATEPAYERS BEAR COSTS
Full Materialization	**Managed Growth** Demand materializes; customer covers infrastructure costs entirely	**Cross-Subsidized Growth** Facilities operate as expected, but some costs are absorbed indirectly by utilities/ ratepayers via rates	**Direct Subsidy** Demand realized, but ratepayers or policy programs provide explicit financial support to cover infrastructure
Partial Materialization	**Private Stranding** Facilities underutilized; customer absorbs costs	**Partial Subsidy Growth** Load grows more slowly than expected; costs shared between customer and ratepayers indirectly	**Stranded Assets (Partial)** Facilities underutilized; ratepayers bear most costs, possibly via direct support or stranded investments
Does Not Materialize	**Total Private Loss** Customer pays for unused infrastructure	**Shared Loss** Both customer and ratepayers absorb costs indirectly	**Stranded Assets (Full)** Facilities absent; ratepayers or programs bear full cost of unused infrastructure

Commitment Risks and What "Good" Looks Like

The infrastructure required to serve hyperscale electricity demand—including generation, transmission, and distribution—is capital-intensive, immobile, and financed over multiple decades. Approving such infrastructure commits the system to long-term obligations, which can result in:

- Higher fixed costs that persist for decades
- Dependence on specific fuel sources or technologies
- Reduced flexibility to respond to future demand shifts, technological changes, or policy priorities

Importantly, these risks remain even if individual facilities relocate, scale down, or do not fully materialize.

Given these stakes, utilities and regulators must carefully evaluate large-scale electricity demand, paying attention to practices that signal potential risk—or "red flags"—while promoting best practices that ensure costs are allocated appropriately and system resilience is maintained. Table 3 highlights key areas to monitor, showing both cautionary signals and examples of strong, responsible approaches.

TABLE 3. RED FLAGS VS. BEST PRACTICES

CATEGORY	WHEN TO EXAMINE CAREFULLY	WHAT "GOOD" LOOKS LIKE
Infrastructure Timing	Built before load commitments are confirmed.	Long-term load commitments or financial guarantees are in place.
Customer Concentration	Transmission or generation upgrades justified by a single customer.	The hyperscale customer fully bears the cost of triggered infrastructure.
Contracts & Processes	Special contracts bypass standard tariffs or planning processes.	Transparent public review of decisions and contracts.
Cost Recovery	Costs recovered from ratepayers before demand materializes.	Costs are clearly allocated to the responsible customer.
System-Wide Planning	Clustering impacts are assessed project-by-project rather than system-wide.	Scenario-based planning and stress testing for uncertainty; consistent treatment across similar customers.

Key Questions for Policymakers

Integrating hyperscalers into the electricity grid requires careful thought across several areas. Decisions about infrastructure investment, who pays, how risks are managed, and how the market is structured can have long-lasting effects on reliability, affordability, and sustainability. A practical way to approach these issues is to ask the right questions up front. The table below lays out key questions policymakers should consider, along with guidance to help ensure planning is fair, transparent, and aligned with long-term energy goals.

TOPIC	KEY QUESTIONS	POLICY CONSIDERATIONS/GUIDANCE
Cost Oversight	Who pays for new generation, transmission, or distribution upgrades? Are costs assigned to the data center or shared across all ratepayers?	Require hyperscale customers to bear the cost of infrastructure triggered by their load. Avoid deferred or hidden costs that create long-term burdens for other ratepayers.
Risk Management	What assumptions drive expected load growth and duration? Who bears responsibility if demand slows or the facility exits?	Use scenario-based planning and stress tests. Allocate risk to the responsible party, not the public. Plan for multiple outcomes: optimistic, moderate, and pessimistic.
Market Structure & Transparency	Are decisions made through standard planning and tariffs or special contracts? Are arrangements transparent and applied consistently?	Ensure public review of contracts and approvals. Avoid preferential treatment that bypasses standard regulatory processes. Maintain consistent treatment of similar customers.
Long-Term Implications	Do near-term reliability decisions lock in expensive or inflexible infrastructure? Are current choices aligned with decarbonization and affordability goals?	Assess how upgrades impact future grid flexibility and technology options. Align infrastructure decisions with long-term policy objectives, including renewable integration and cost containment.