



Large Load Growth: Regional Responses and Emerging Grid Challenges

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Large Load Growth Has Become a System-Level Issue

What Changed?

- AI/data center demand acceleration
- Manufacturing reshoring and electrification
- Large industrial and crypto load growth
- Load timelines now faster than generation and transmission build timelines
- Increasing concerns about affordability

Large Load Growth Has Become a System-Level Issue

Core Tension:

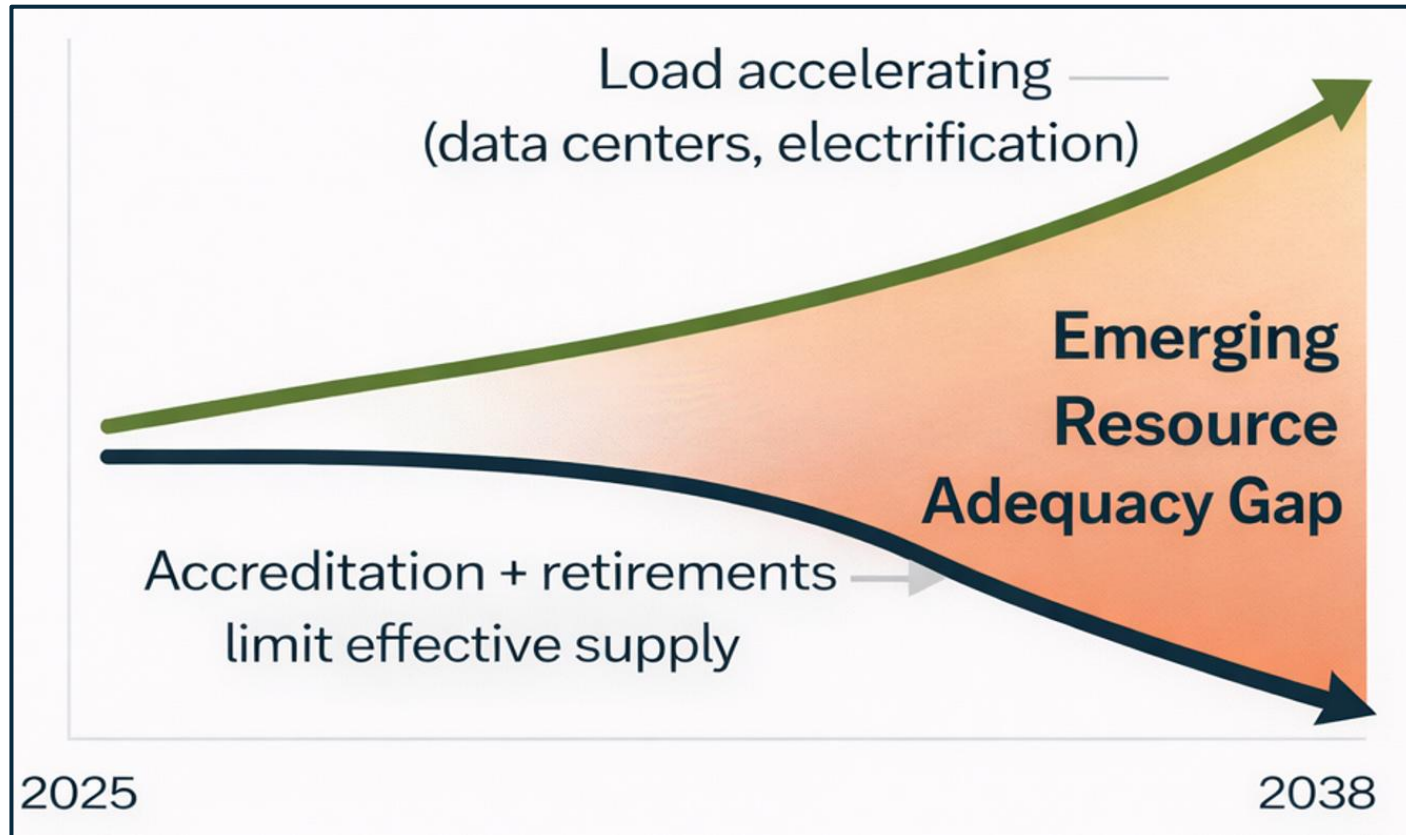
Customers Want

- Fast energization
- Firm service
- Cost certainty
- Flexibility in Contracting

Grid Operators Need

- Reliability preservation
- Infrastructure readiness
- Fair cost allocation
- Operational visibility/control

The Grid is Tightening: Physically and On Paper



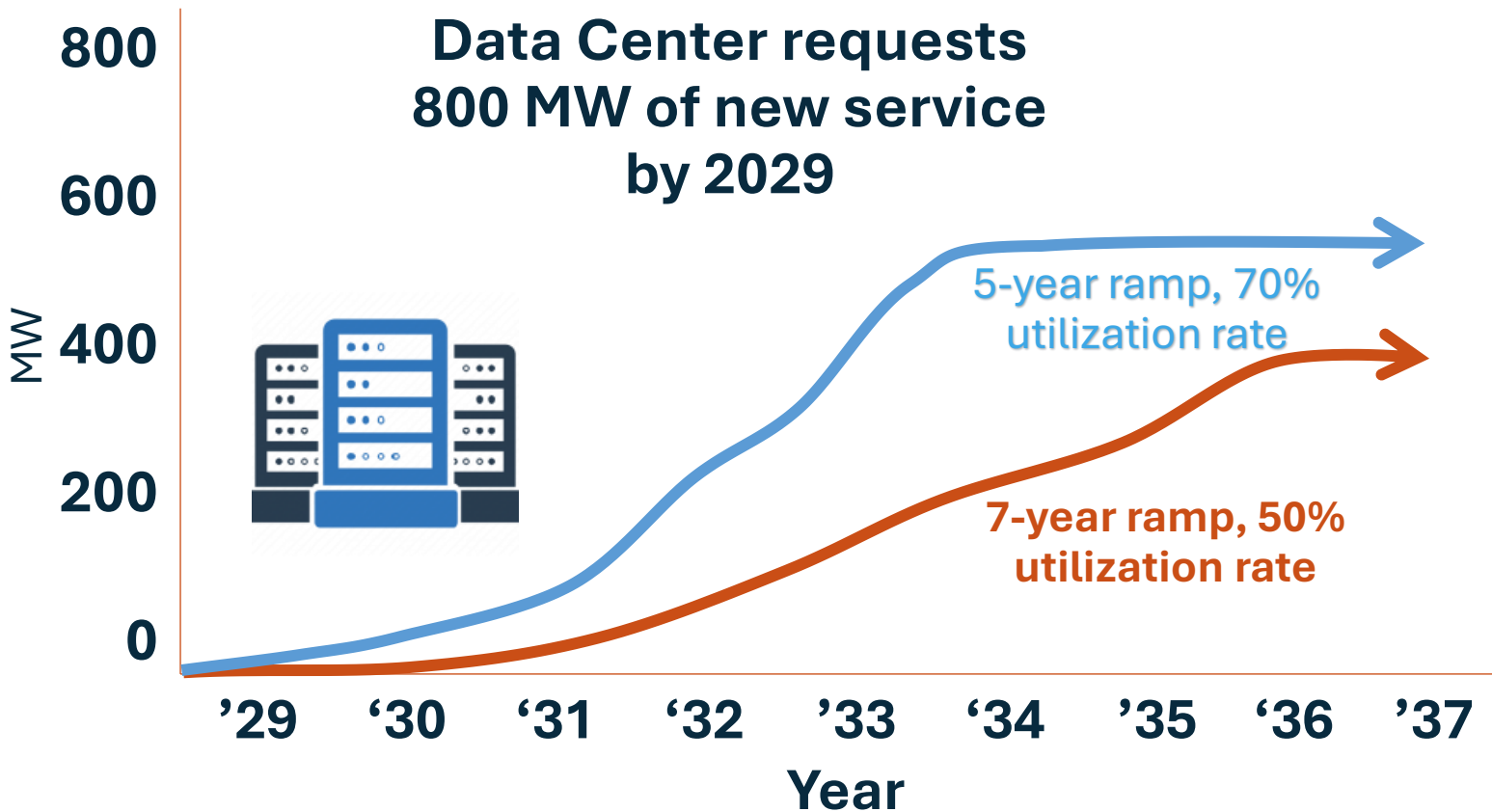
- **Accelerating load growth (Data Centers, Electrification, etc.)**
- **New supply has been slow to arrive**
- **Accreditation reduces “usable” capacity**

Power markets are tightening before the next wave of load growth

800 MW ≠ 800 MW

Why large concentrated load forecasting is uncertain

**Data Center requests
800 MW of new service
by 2029**



What makes it hard:

- Ramp varies and is often uncertain
- Utilization rate is often not as high as expected
- Some projects are speculative

A single request can translate into very different real load outcomes

The Industry is Still Building the Operating Model

What's Changed:

- Large, lumpy load growth
- High uncertainty (timing, ramp, utilization)
- Long-lead time infrastructure

Forecast Uncertainty



What we're seeing emerge:

- More structured /phased approaches
- Greater focus on timing certainty
- New constructs around flexibility
- Ongoing debate on cost & risk allocation

There isn't a single answer yet — and importantly, we're making these decisions in real time while the system is under stress

Reality Check: Flexibility Has Limits

The Narrative

What we hear:

- Growing focus on demand flexibility
- Innovation underway (including excellent work from EPRI!)
- System can have large loads and be reliable and affordable – if they provide boundless curtailment and help balance the system

The Reality

What we're seeing:

- Strong interest in flexibility under defined conditions — but flexibility should not be assumed universally
- Different types of load often sit behind one meter, particularly in multi-tenant
- Many loads are operationally critical
- Curtailable tariffs do not automatically create flexible load

Much of this load isn't flexible – and we shouldn't force it to be

Financial systems • Healthcare • Aviation • Communication Networks • National security

Jurisdiction: Who controls access to Power?

States + Utility Role

- Control
 - Generation siting
 - Transmission siting (largely)
 - Retail rates and service
- Data centers:
 - Request service from local utility
 - Interconnect through utility processes

How Power is Procured

- Regulated states:
 - Utility provides bundled service
- Retail choice states:
 - Customer can procure from LSE / competitive supplier
 - But only after physical connection is secured

Federal Layer: FERC and DOE

- FERC
 - Wholesale markets
 - Interconnection rules (RTO/ISO)
- DOE ANOPR
 - Large load interconnection
 - Asserting federal jurisdiction
- FERC commitment
 - Action expected by June

State Level Response: Tariffs and Risk Management

What this layer is trying to solve: utilities and regulators are trying to serve large loads without shifting stranded-cost, transmission, distribution, and generation-risk costs onto existing customers.

Common Tariff Components

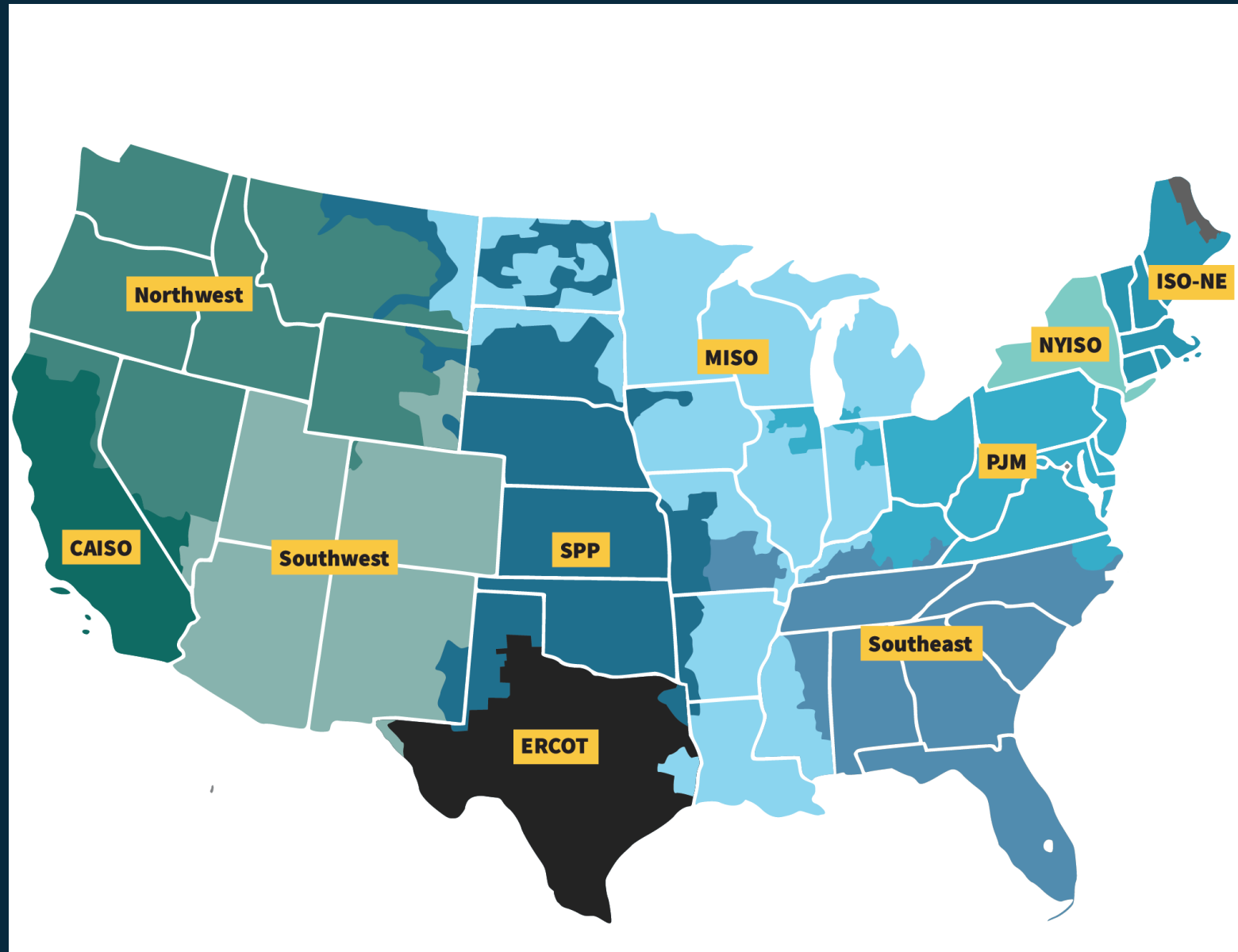
- Minimum contract term (often 10-15 years)
- Take or pay obligations
- Financial security, deposits, or collateral
- Customer-funded interconnection, network, or upstream upgrade costs
- Exit fees / early termination fees
- Load ramp schedules and study fees
- Flexibility provisions / clean energy provisions

Large Load Tariffs are Proliferating Quickly

Market signal: Utility Dive reported that state regulators approved 29 large-load tariffs in 2025. Recent Examples:

- **Ohio / AEP Ohio:** PUCO approved AEP Ohio's data-center tariff settlement on July 9, 2025; the tariff became effective July 23, 2025.
- **Georgia / Georgia Power:** Georgia PSC approved a rule in January 2025 for new customers over 100 MW, including longer contract terms, minimum billing, and recovery of site-specific and upstream generation/tx/distribution costs.
- **Indiana:** IURC approved large-load interconnection terms in February 2025.
- **Virginia / Dominion:** SCC approved a new GS-5 high-load rate class for customers at or above 25 MW, effective January 1, 2027.

Federal and RTO Level Response



Vertically Integrated vs. RTO Regions

Vertically Integrated

Typical Approach

- Utility-led planning
- Bilateral service agreements
- Utility resource planning
- Utility transmission expansion

RTO Regions

Additional Complexity From:

- Resource adequacy
- Generation interconnection queues
- Market design
- Different state priorities or policies
- Forecasting details

RTOs are solving a coordination problem. Not just a construction problem.

SPP: Speed-to-Power Through Flexibility

Key Concept: SPP established a goal to lead the nation in enabling rapid, reliable and innovative solutions to interconnect large loads

HILL / HILLGA: Parallel study process for High Impact Large Loads and supporting generation

CHILLS: Conditional curtailable service before upgrades are fully complete

PAL (Price Adaptive Load): Long-term flexible/price responsive service (e.g., crypto)

CPP (Consolidated Planning Process): Integrates generation interconnection, transmission planning, and load growth

Key Challenges: Commercially untested; conditional or curtailable service may not be viable for many large loads; CPP framework in very early stages

PJM: Co-Location and Scarcity Management

Core Issues: Resource adequacy shortfalls, affordability pressure, explosive data center growth, challenging load forecast, co-location questions

Co-location rules

- Who pays for grid usage and standby reliability?

New transmission products

- interim network service
- firm/non-firm contract demand concepts

Connect-and-manage concepts

- Load that doesn't bring new capacity subject to early-stage curtailment

Backstop resource concepts

- Potential auction for 15-year long term contracts for new generation – cost allocation is tricky

Key Challenges: Jurisdictional limitations mean that PJM cannot solve this alone; ongoing uncertainty compounds challenge of bringing more power online

MISO: Reliability Requirements and Flexible Integration

Key Concept: Needs to evolve its approach to integrating new large loads and develop long-term solutions to maintain reliability while enabling fast-paced load growth

Improved Forecasting = Improved Planning

- Moved forecasting in-house, third-party input
Large Load Pilot Survey of Market Participants
- Improved forecasts support Long-Term
Transmission and Resource Planning

Reliable Operations

- *Reserve product enhancements*
- *Operational coordination reforms*

Speed to Power & New Flexible Pathways

- Firm-service step up concept
- Co-location Zero-Injection GIAs (ZGIAs)
- Focus on automation to speed queue cycles

Interconnection Reliability Requirements

- Telemetry and Ride-Through Standards*
- *Ramp-Rate Controls*

Key Challenges: Generation additions *may not be able* to keep pace with load, and interconnection queue backlog persists affecting existing queue cycle.

ERCOT/Texas: SB6

Texas is building:

- Standardized interconnection rules
- Commercial-readiness requirements
- Curtailment ready operations
- Co-location oversight
- Forecasting discipline

Curtailment-ready operations are becoming normalized

- Software-managed load reduction
- Batteries
- Behind-the-meter generation
- Flexible compute architectures

Key Differences: Single-state RTO with jurisdictional through-line and much shorter timeline for new infrastructure build out

Cross-Regional Themes

- 1. Speed to Power vs. Reliable Service**
- 2. Flexibility is Becoming Valuable**
- 3. Co-Location is Reshaping Rules**
- 4. Planning Uncertainty Is Growing**
- 5. Cost Allocation is Politically Sensitive**
- 6. Existing Frameworks were not designed for this Scale**

What Makes This Hard?

The Physical Challenge: Load can appear in 18–36 months. Transmission and generation often require much longer.

The Market Challenge: Growing interest in bifurcated market structures risks undermining long-term wholesale market sustainability

The Regulatory Challenge: Authority is fragmented across multiple jurisdictions with tremendous risk of intervention

The Opportunity: Large load can fund innovative and more efficient resources, needed infrastructure upgrades to an increasingly aged grid – and deliver reliability and cost savings.

If done correctly, it can be win-win.

A Balanced View — and the Path Forward

Demand Response Has Tremendous Value

- Peak reduction matters
- Flexibility can support the system

Most large loads still require firm, reliable service

What it Takes

- Build generation & transmission faster
- Clarify cost allocation
- Improve load forecasting
- Use flexibility where it works

THE BOTTOM LINE

We still need more power — infrastructure buildout is essential

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