Large Loads: Evolving Practices and Opportunities

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Natalie Mims Frick

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ENERGY TECHNOLOGIES AREA
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Poll

What is your top concern or current challenge with large electricity loads?

- Resource adequacy
- Load forecasting
- Tariff design
- Generation interconnection
- Load interconnection

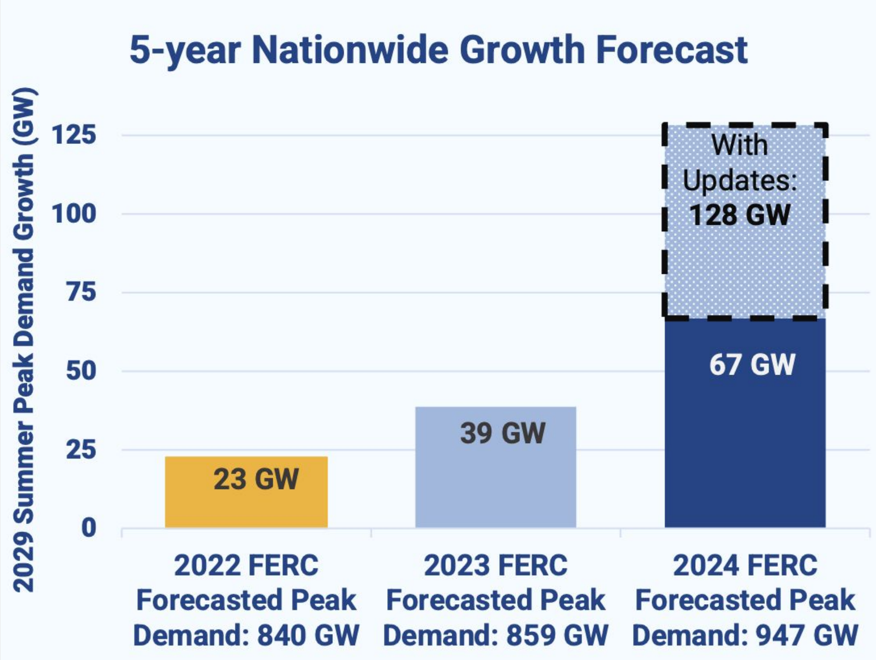
Overview of presentation

- Large load growth in the U.S.
- Large load forecasting and interconnection
- Tariff design
- Actions states are taking
- Resources

These are examples of emerging issues associated with large loads and are not intended to be comprehensive.

Large load growth in the U.S

Load growth estimates



Source: GridStrategies

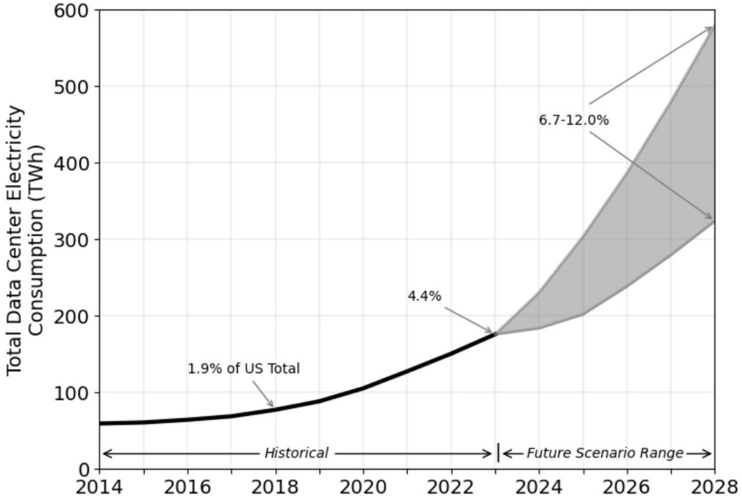


Figure ES-1. Total U.S. data center electricity use from 2014 through 2028.

Source: LBNL

Examples of load growth drivers

- Large load growth is occurring from re-shoring manufacturing, electrification and data centers.

- These loads will have different temporal and locational impacts on the grid, and create different efficiency and flexibility opportunities.

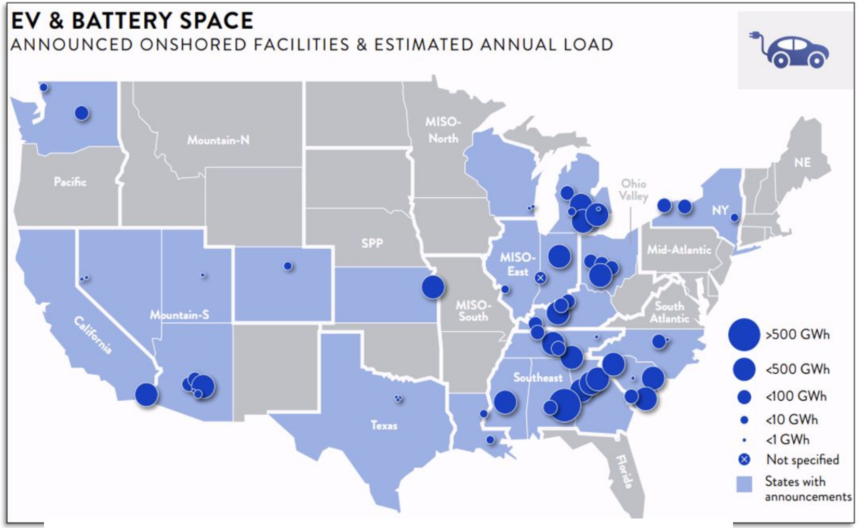
Near-Term Load Drivers	Data Centers	Manufacturing	Electrification
Arizona Public Service	●		
CAISO	●		●
Duke	●	●	
ERCOT	●	●	
Georgia Power	●	●	
ISO-NE			●
MISO	●		●
NYISO	●	●	●
Pacific Northwest	●	●	
PJM	●	●	●
SPP	●		

Source: GridStrategies

Onshore Manufacturing Load Growth

EV/Battery manufacturing is the largest sector of growth, but is relatively modest compared to data center growth

Announced Facilities in EV & Battery Space (as of 3/2023)
(Source: EPRI)



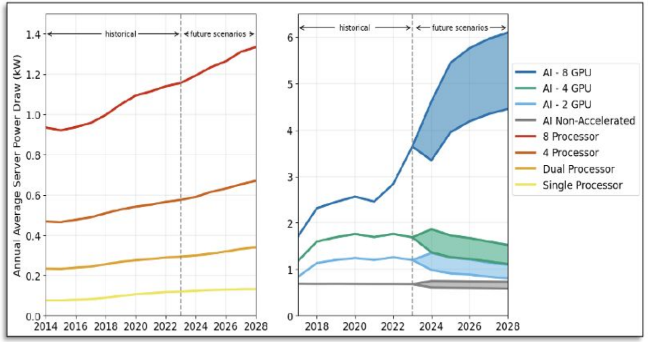
Source: EPE

Peak Load Impact (MW) from New Onshored Manufacturing
(Source: Brattle, citing EPRI)

	EV/ Battery	Fuel / Plastic/ Chemical	Metals	Semiconductor/ Electronic	Solar	Wind	Transportation	Other	Total
Southeast	327.3	34.1	8.3	-	25.5	-	-	0.4	395.6
Mountain-South	30.3	2.0	-	170.9	1.6	-	-	-	204.8
Ohio Valley	98.6	4.1	78.7	-	3.5	-	0.0	0.0	185.0
MISO-East	127.5	20.0	-	-	-	-	0.0	-	147.5
South Atlantic	129.8	0.0	1.3	-	1.0	-	-	-	132.1
California	32.3	-	54.8	0.1	9.3	-	-	-	96.5
Mid-Atlantic	-	78.9	0.2	-	0.5	-	6.5	5.5	91.6
Florida	-	-	-	85.0	-	-	-	-	85.0
MISO-South	2.3	52.4	27.4	-	-	-	-	0.0	82.1
New York	12.5	-	-	0.4	0.4	46.8	-	-	60.1
Texas	0.1	52.1	-	-	1.5	-	-	-	53.7
SPP	22.8	-	-	-	-	-	0.1	-	22.9
Pacific	11.6	-	-	-	-	-	-	-	11.6
MISO-North	-	-	0.6	-	0.2	-	-	2.0	2.8
New England	-	-	0.0	-	-	-	-	2.0	2.0
Mountain-North	0.6	-	-	-	-	-	-	-	0.6
Total (MW)	**795.7**	**243.6**	**171.3**	**256.4**	**43.5**	**46.8**	**6.6**	**10.0**	**1,573.9**

Understanding Data Center Growth in Four Charts

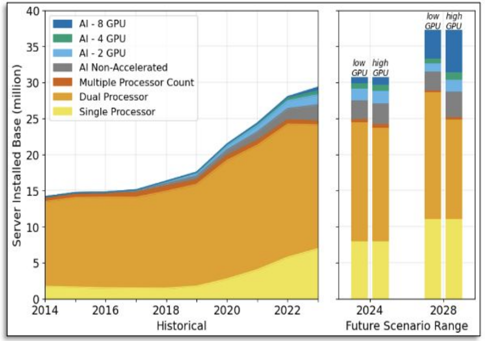
Aggregate average power draw of various server types across each analysis year
(Source: LBNL; Figure 3.7)



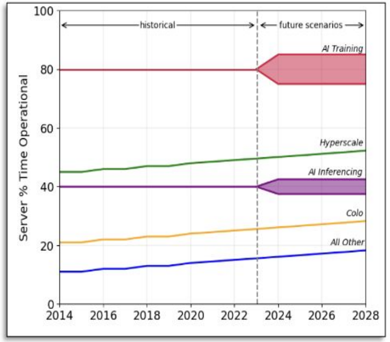
AI GPUs use significantly more energy

Total server installed base for 2014–2028 with higher bound shipments (left). Adjusted installed base with lower bound GPU shipments (right)
(Source: LBNL; Figure 3.9)

The number of installed AI services is growing significantly



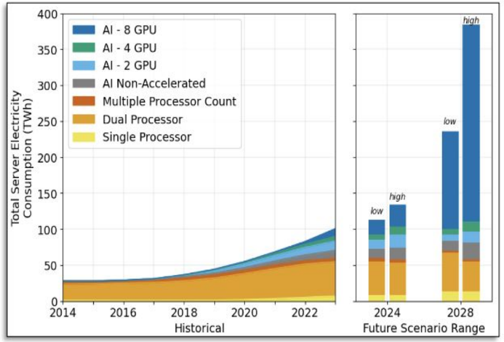
Operational time of servers by server type
(Source: LBNL; Figure 3.6)



Server utilization is increasing with AI

Server annual electricity usage by type
(Source: LBNL; Figure 5.1)

Combined, these three factors lead to dramatic increases in overall data center demand

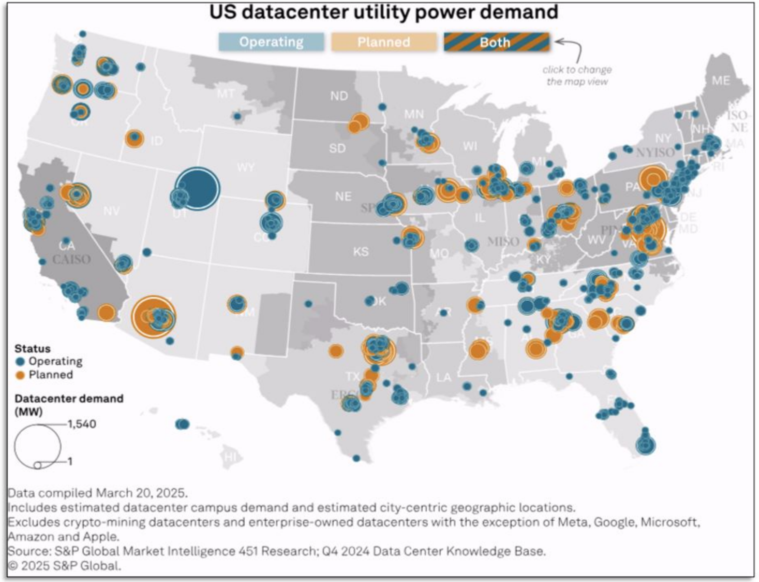


Source: EPE, LBNL

Data Center Demand is concentrated *and* diverse

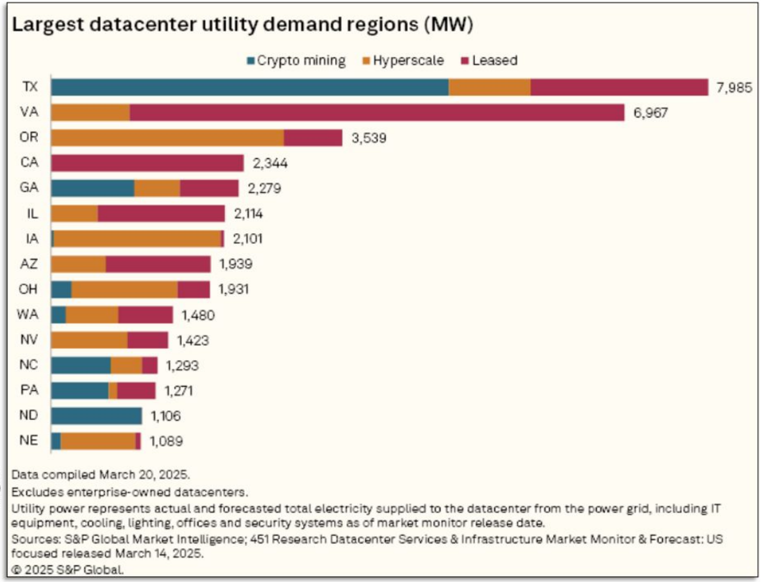
Location, Location, Location. "Data Center" is a broad term, and the details matter

Location & Size of Operating & Planned US Data Center
(*Source: S&P Global Market Intelligence 451 Research*)



While relatively dispersed, data center loads are also highly concentrated in certain states, like Texas, Virginia, Oregon, California, and Georgia.

Data Center Type for Largest US Data Center Regions
(*Source: S&P Global Market Intelligence 451 Research*)



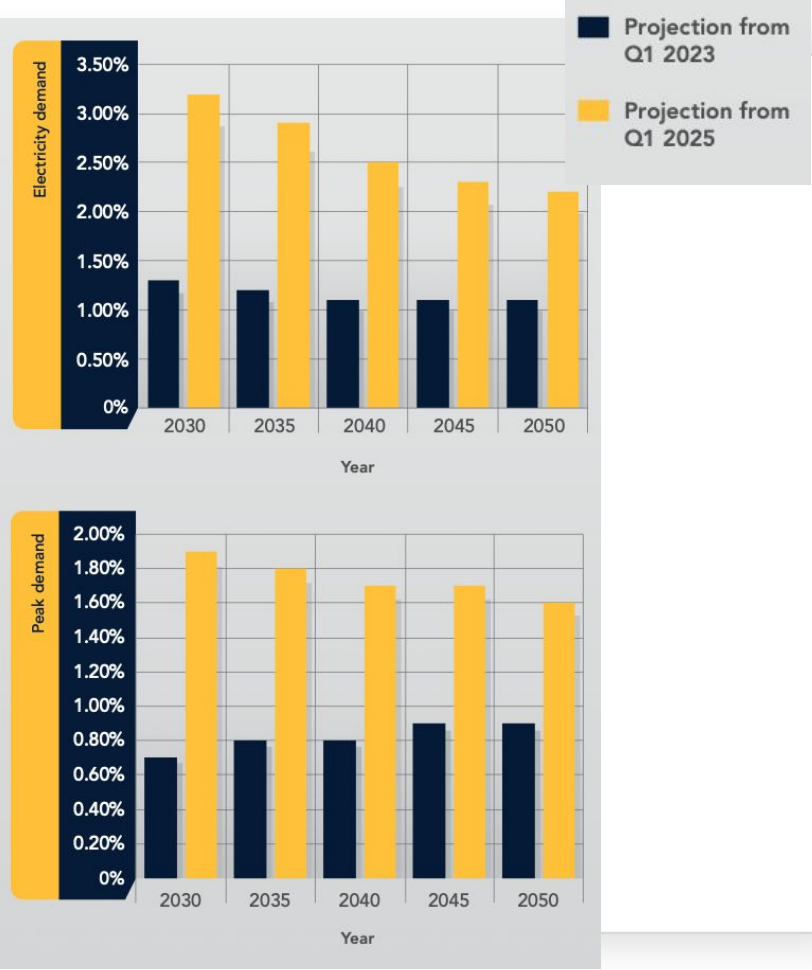
But the composition of those data center loads are diverse, which leads to different policies and forecasting needs.

Source: EPE

Large load forecasting and interconnection

Load forecasting

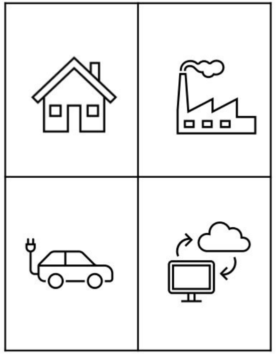
- Many utilities are projecting significant load growth from large customers.
- Information on load growth often appears in utility integrated resource plans (IRP).
- As states evaluate load forecasts, they can consider the timing, type and risk associated with the growth.

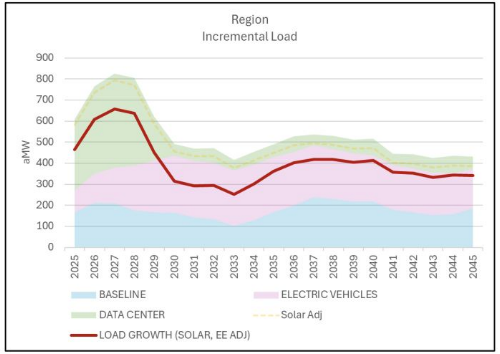


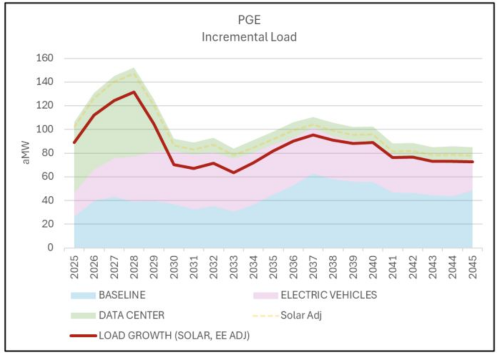
Source: ICF; from ISO/RTO forecasts, NERC ES&D, utility IRPs, ICF

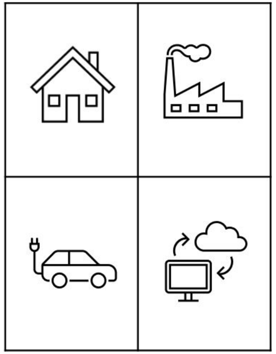
Type and timing

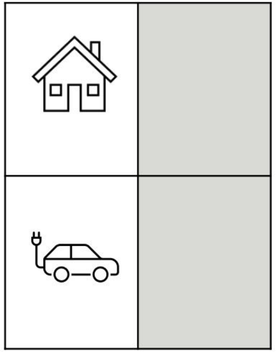
Load growth from data centers, manufacturing, building electrification and EV charging will occur at different times (daily, seasonally and annually) and locations on the grid.

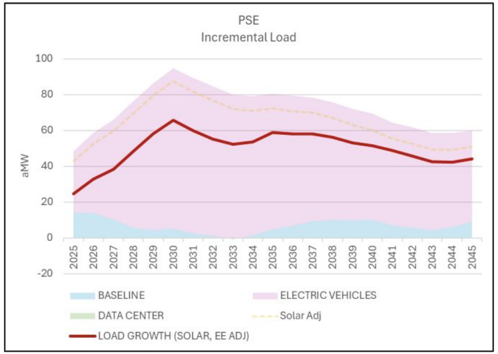


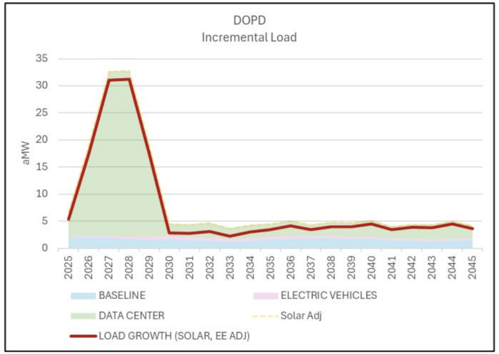








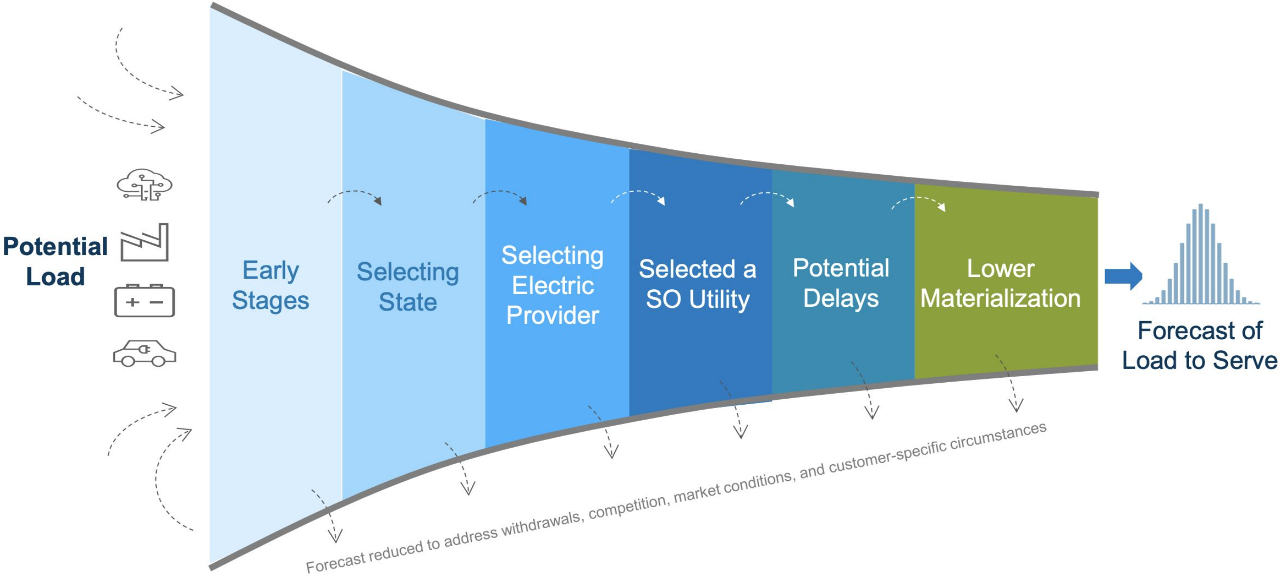




Source: Northwest Power and Conservation Council

Risk

Uncertainty about how much load growth will materialize creates risk for utilities and customers.



Adjustments are based on experience and continuous engagement with customers

State-of-the-Industry in Data Center Forecasting

Overall, there is "no consensus" among utilities; practices and forecasting methods vary widely

Trends Regarding Utility Data Center Load Forecasting
(Source: EPRI)

General trends in load forecasting with DCs

- **No consensus** among 24 responding utilities* on how DC service requests are included in load forecasts
  - Ten utilities include the full requested capacity (as specified by the DC customer) but 8 of the 10 ramp the capacity over time
  - Another eight utilities include a derated capacity value based on specific weighting criteria (see next page)
  - Six utilities do not presently include DC requests in their load forecasts
- All face challenges around incorporating DCs into load forecasts given the **speculative nature** of some DC service requests

*One utility (out of the 25 total) did not respond to this specific question

Source: https://www.youtube.com/watch?v=1ewNuk6H28w, EPRI

State-of-the-Industry in Data Center Forecasting

Overall, there is “no consensus” among utilities; practices and forecasting methods vary widely

How Some Utilities Derate Data Center Loads

(Source: EPRI)

Examples of how five utilities derate requested data center capacity values for use in load forecasting:

- **Utility A:**
  - Derating depends on multiple factors, but DC type has largest impact. Also, generally derate colocation DCs more than enterprise.
  - Derates DCs more than other large loads due to less accurate information from DCs.
- **Utility B:**
  - Considers DCs in the forecast process similar to other large loads. But tends to have less information about DCs, which leads to more uncertainty.
  - For corporate load forecast, consider each DC individually but focus is on forecasting DCs in aggregate.
- **Utility C:**
  - Derates all DC requests by 20% based on prior experience. Will also vary the derating when forecasting multiple scenarios, for example, a 10% and 0% derating.
  - DCs are currently the only sector for which their load forecasts are based on connection requests. However, considering applying a similar derating process for electrolysis projects in the future.
- **Utility D:**
  - Derating based on multiple factors, including historical experience with other similar customers.
  - Currently treats DCs differently from other large loads for load forecasting. Within DCs, derating varies based on type of DC, MW size, etc.
  - Current experience has led to derating crypto mining customers more than hyperscalers given hyperscale DCs tend to more closely adhere to their contract loads.
  - Only considers DC customers in five-year load forecast who have signed an agreement with the utility.
- **Utility E:**
  - Derating depends on multiple factors, but biggest factors are (1) whether the data has submitted a formal connection request and (2) whether there is available infrastructure to support the DC's requested capacity.
  - Derating of DCs for load forecasting is more granular than other large loads given the diversity and uncertainty of DCs as a category.

None of the responding utilities provided an explicit calculation/equation for derating DC for load forecasting.

EPRI

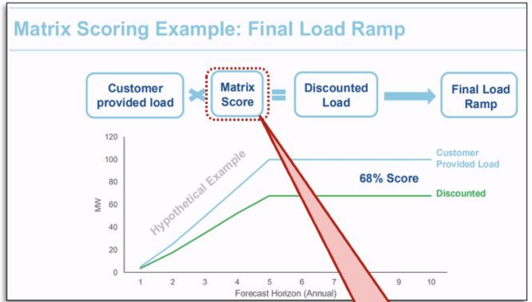
Source: EPE, EPRI

State-of-the-Industry in Data Center Forecasting

Examples of more complex utility data center load modeling approaches design to better address uncertainty.

Southwest Utility Example

(Source: ESIG Large Loads Task Force presentation)

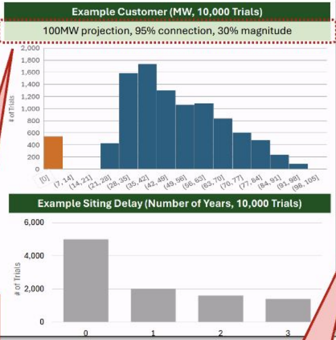


The "Matrix Score" concept is designed to reflect uncertainty across multiple dimensions, such as energy infrastructure, client construction, development permits, land acquisition, and other intelligence.

Southeast Utility Example

(Source: ESIG Large Loads Task Force presentation)

- Likelihood of Connection
  - Binary variable to determine if customer locates on system
  - Uniform distribution (randomized to match probability)
- Magnitude Adjustment
  - Adjustment to reflect lower usage than projected
  - Triangle distribution (trend to internal projection)
- Siting Delay
  - Potential delay in customer connection of 0-3 ye
  - Left-skewed (no delay)
- 50,000 Trials



There are the key simulation parameters determined via a combination of data analysis and expert judgement.

Dominion Virginia Example

(Source: DOM VA 2023 IPR Testimony and 2023 IPR)

Forecasting Methodology

The Company has been tracking data and preparing forecasts for a long period of time and has developed a very robust forecast methodology. Figure 4.1.5.1 compares the Company's forecast to actual data center demand for 2020-2022.

Figure 4.1.5.1 – Data Center Industry Peak Billed Demand in MW
Company Service Territory

Forecast Year	Forecast and Results: Forecast	Forecast and Results: Actual	Variance: Over/(Under)	% of Variance To Actual
2020	1,559	1,808	249	14%
2021	2,179	2,302	123	5%
2022*	2,848	2,767	(81)	-3%

* 2022 was the year of the transmission capacity constraint.

The Company models industry demand growth using the following method:

- Segments the modeling using the eight largest or fastest growing customers and a ninth model consisting of all remaining customers combined into one segment – nine models in total
- Statistically models sales in MWh including lost retail choice sales
- Statistically models demand (MW) using three different approaches
  - Approach 1: linear regression of demand
  - Approach 2: polynomial regression of demand
  - Approach 3: linear regression of sales to demand
- One of these three approaches is selected for each of the nine customer segments based on customer provided intelligence
- Estimate future retail choice conversions (lost MWh sales)
- Develop high, medium, and low demand scenarios
- In total, there are 27 models used to develop the forecast

Transparent inclusion of historical data comparing the actual data against past forecasts.

Inclusion of confidential customer intelligence provides unique insights that can help calibrate a forecast

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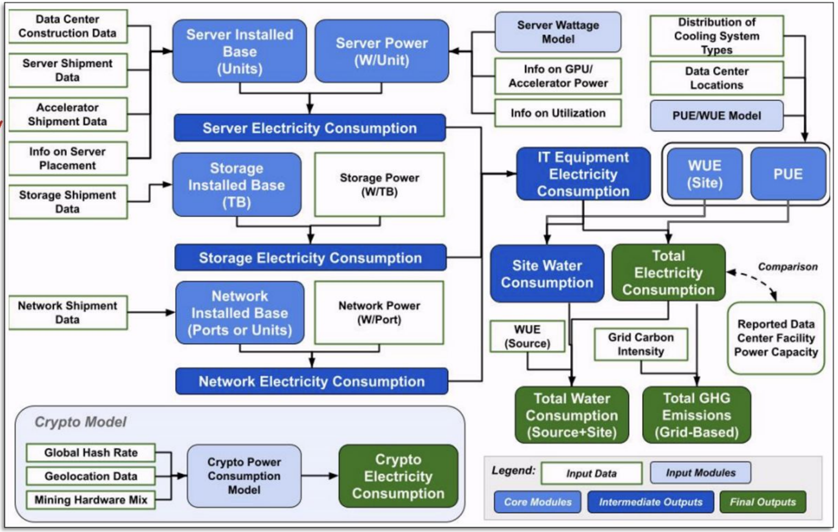
Source: EPE

Bottom-up Data Center Modeling: The Gold Standard?

LBNL's Data Center Energy Usage Report represents one of the most robust *publicly* available data center load forecasting methodologies. But is it a feasible model for others to emulate?

Flow chart for the data center electricity model used in LBNL study

(Source: LBNL; Figure 2.1)



This model requires significant resources to develop and operate, including:

- Third party data purchases
- Multiple sub-models and simulation engines
- Access to industry experts

ELECTRIC POWER ENGINEERS

Load forecasting example

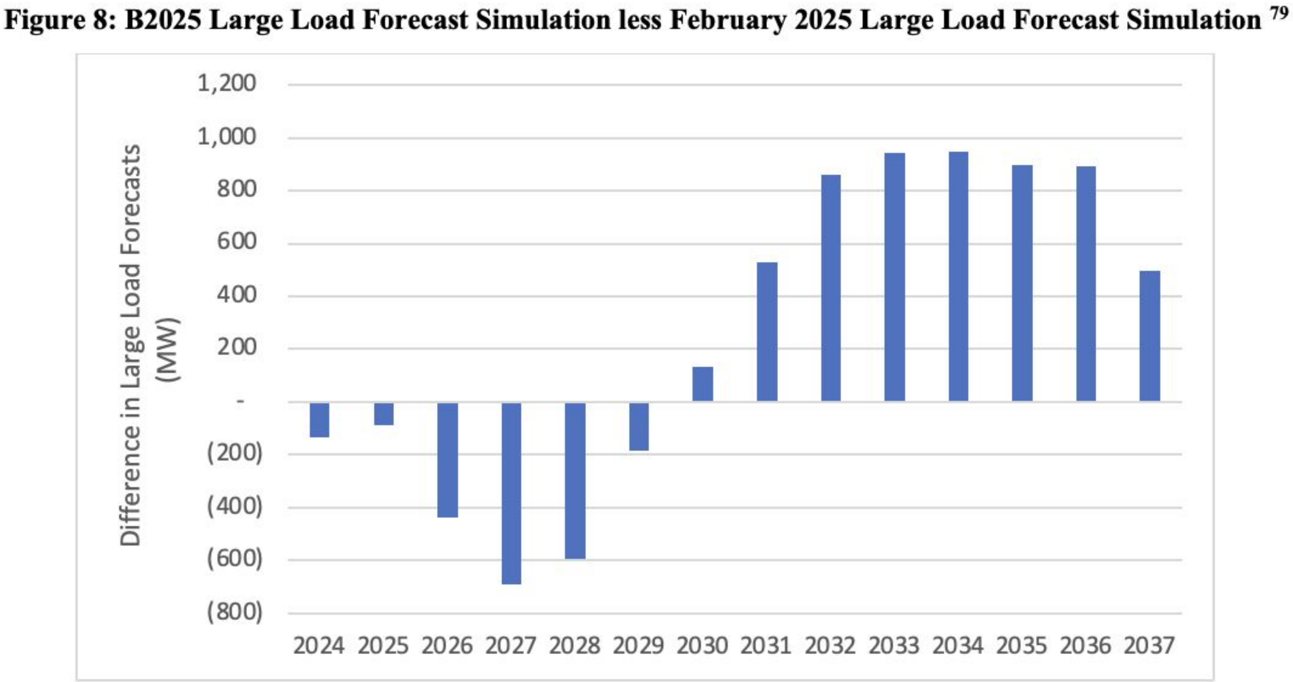
- Georgia Power's load forecast in their 2025 IRP projected 107% compound annual growth rate for commercial large load summer peak load.

- Georgia PSC Staff testimony found (among other findings)
  - "Since the 2023 IRP Update, the Company has identified a significant rate of project removals and net load reductions in its large load pipeline.
  - Project removals and net load reductions are concentrated amongst data center projects, particularly those in the Technical Review stage.
  - The Technical Review stage refers to projects that have not yet signed a Request or Contract for Electric Service. The Company does not consider these projects as "committed customers.""

Table 5: B2025 Load Forecast, Key Growth Drivers for Coincident Peak Load, 2024-2032[25]

		Summer			Winter		
Category	**Item**	Cumulative Growth (MW)	Portion of Cumulative Growth (%)	CAGR (%)	Cumulative Growth (MW)	Portion of Cumulative Growth (%)	CAGR (%)
Organic Load Forecast	Residential	[redacted]	[redacted]	1.3%	[redacted]	[redacted]	0.6%
	Commercial	[redacted]	[redacted]	2.1%	[redacted]	[redacted]	1.9%
	Industrial	[redacted]	[redacted]	1.2%	[redacted]	[redacted]	1.6%
	Governmental Lighting	[redacted]	[redacted]	7.8%	[redacted]	[redacted]	-39.1%
	MARTA	[redacted]	[redacted]	-0.2%	[redacted]	[redacted]	-0.1%
Coincident Peak Adjustments	Cogeneration	[redacted]	[redacted]	32.0%	[redacted]	[redacted]	32.0%
	DSM	[redacted]	[redacted]	28.7%	[redacted]	[redacted]	15.0%
Large Load Adjustments	Commercial Large Loads	[redacted]	[redacted]	107.6%	[redacted]	[redacted]	107.6%
	Industrial Large Loads	[redacted]	[redacted]	56.9%	[redacted]	[redacted]	56.9%
Total		**9,702**	**100.0%**	**5.8%**	**8,909**	**100.0%**	**5.7%**

Load forecasting example (2)

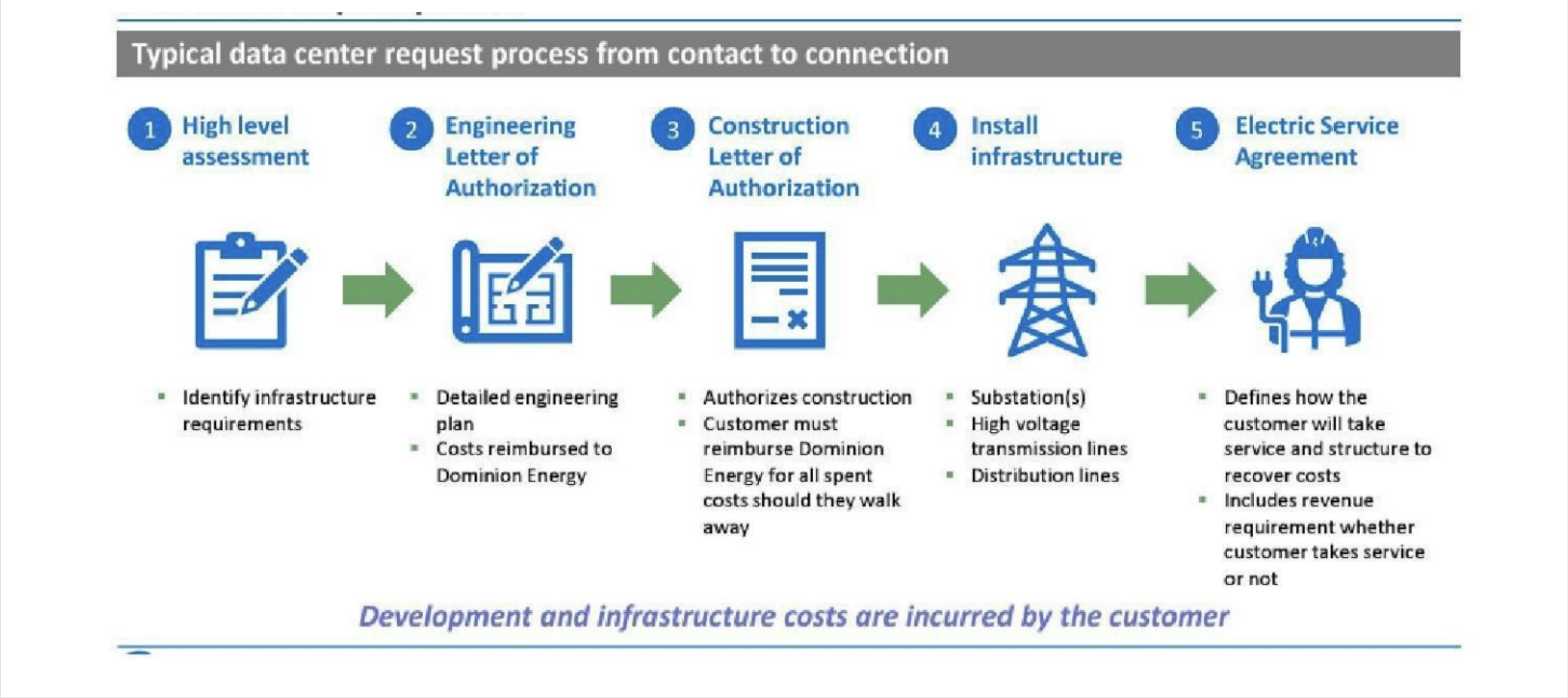


Source: [Georgia PSC]

Large load interconnection process

- Interconnection of large loads can be complex, intersecting with IRP and utility or RTO transmission planning.
- Often, there is not a publicly available description of a standardized process to interconnect a large load to a utility system.
- Speculative load interconnection requests have contributed to difficulties in processing new requests and in assessing whether there is enough generation and transmission capacity to meet demand.

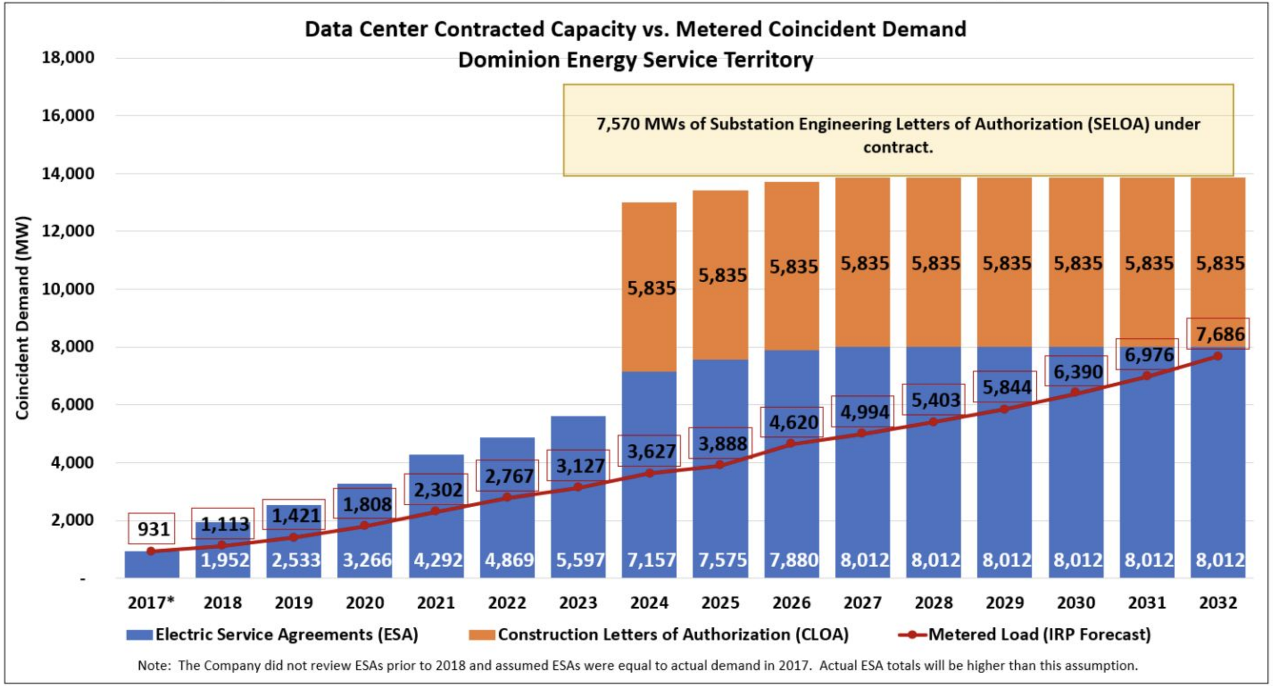
Dominion Energy
Data center request process



Source: [Dominion Energy]

Dominion Energy
Construction Letter of Authorization and Electric Service Agreements

Dominion provides information on the quantity of load in different stages of interconnection in their IRP.



Source: Dominion Energy

Tariff designs

With contributions from Andy Satchwell, Peter Cappers, Sanem Sergici, Ryan Hledik, Goksin Kavlak, and Glenda Oskar

Energy Markets & Policy
BERKELEY LAB

January 2025

Electricity Rate Designs for Large Loads: Evolving Practices and Opportunities

Andrew Satchwell, Natalie Mims Frick, and Peter Cappers (Berkeley Lab)
Sanem Sergici, Ryan Hledik, and Goksin Kavlak (The Brattle Group)
Glenda Oskar (U.S. Department of Energy)

Electricity demand from large-load customers such as data centers is projected to grow significantly in the near term. While these large loads play an important role in advancing technology innovation and economic growth in the United States, meeting their energy needs requires utilities and regulators to consider important financial and operational risks from underutilized investments or insufficient energy supply, infrastructure, and operational capabilities, with implications for all ratepayers. This paper provides an overview of how utilities and regulators are managing these risks through different tariffs, including rate structures and service agreements. Utilities, regulators, customers, and other stakeholders can use this paper as a foundation when discussing issues and sharing perspectives on developing new large load tariffs or reviewing existing ones.

Introduction

U.S. electricity demand is projected to grow significantly in the next decade, largely driven by data center expansion and artificial intelligence (AI) applications but also new domestic manufacturing and electrification in other sectors (NERC, 2024). While maintaining a reliable power grid at least reasonable cost and risk is always an imperative, ensuring new data centers have sufficient energy supply to maintain and continuously develop AI training models in the United States is vital for protecting national security and ensuring that AI systems are safe, secure, and trustworthy. The United States also has a strong interest in supporting the domestic development of AI applications, as they represent U.S. leadership in technology innovation and economic growth.

Reliable energy supply and robust infrastructure are critical to the successful deployment and expansion of large loads such as data centers. Data centers are among the most energy-intensive building types due to their continuous operation, computing equipment, and cooling needs.[1] Lawrence Berkeley National Laboratory estimates that total U.S. data center electricity demand more than doubled (2.3x) from 2018 to 2024 and could triple (3.3x) from 2024 to 2028 (Shehabi et al., 2024). Additionally, the power system impact of these customers may be particularly significant for individual utilities and regions. According to the Electric Power Research Institute (EPRI), 12 states accounted for 84% of data center growth since 2020 (EPRI, 2024).

Regulators, utilities, and large-load customers are exploring tariffs including rate structures, electric service agreements, and special contracts that achieve the objectives of reliable and affordable

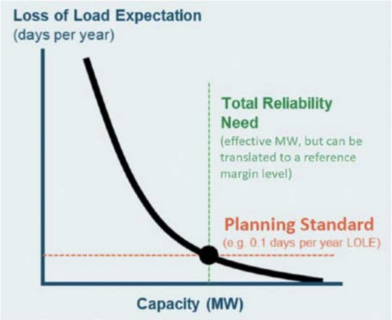
Report available here

Four themes of large load tariffs we reviewed:

- Fairly allocate electricity system costs
- Mitigate utility and customer financial risks
- Mitigate operational and RA risks
- Accommodate the diverse needs of large-load customers

Utilities and regulators may have specific rate design objectives for data centers

Resource adequacy

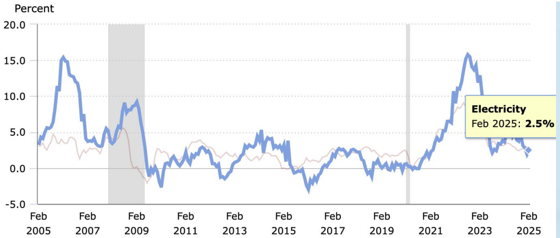


Source: NARUC

Air pollutant reductions

Source: SEIA

Affordability



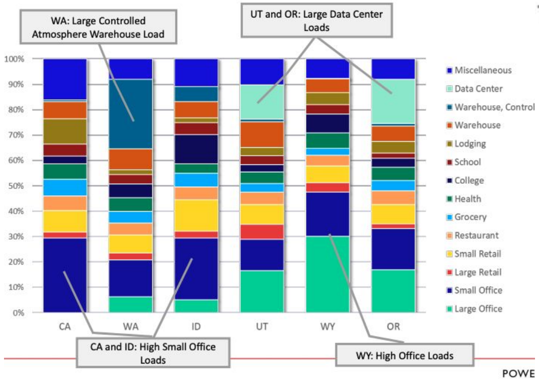
Source: Bureau of Labor Statistics

Desire to attract large load customers

Source: McKinsey & Company

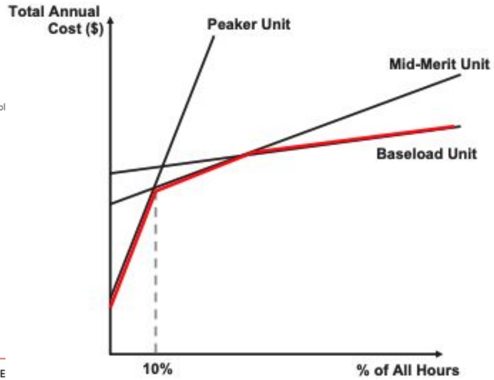
Tariff elements to fairly allocate electricity system costs

Applicability to specific customer type



Source: [PacifiCorp]()

Marginal pricing



Source: [Brattle]()

Economic development payments

Source: [Area Development]()

Tariff elements to mitigate utility and ratepayer financial risks

Upfront payment and exit fees

Source: Giorgio Trovato on Unsplash

Credit rating and collateral requirements

MOODY'S	S&P	FITCH	DESCRIPTIONS	GRADE
Aaa	AAA	AAA	Highest credit quality, minimum credit risk	INVESTMENT
Aa	AA	AA	Very high credit quality, very low credit risk	
A	A	A	High credit quality, low credit risk	
Baa	BBB	BBB	Good credit quality, moderate credit risk	
Ba	BB	BB	Issuer faces adverse conditions and uncertainty, substantial credit risk	HIGH YIELD (or "Junk")
B	B	B	High credit risk, issuer able to meet financial commitments	
Caa	CCC	CCC	Vulnerable and default likely	
Ca	CC	CC	Issuer is highly vulnerable or near default	
C	C	C	Lower ratings, issuer in default	
	D	RD	Lower ratings, issuer in default	
		D	Lower ratings, issuer in default	

Source: Financial Edge

Contract duration, sizing and resizing

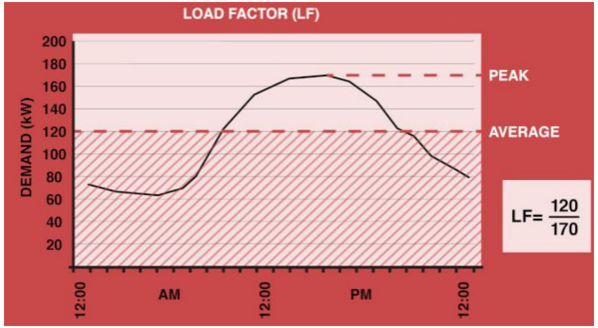
Source: FreePik

Minimum load requirements and demand charges

Total Contract Cap. (MW)	Min. Demand (MW)	Percentage
113	95.50	84.51%
114	96.50	84.65%
115	97.50	84.78%
116	98.50	84.91%
117	99.45	85.00%
117+	85.00%	

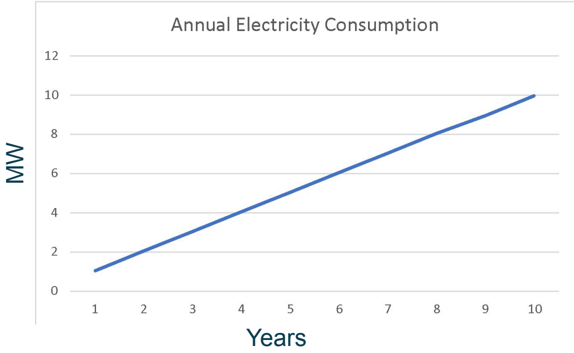
Tariff elements to mitigate operational and resource adequacy risks

Minimum load factor



Source: APS

Ramp times

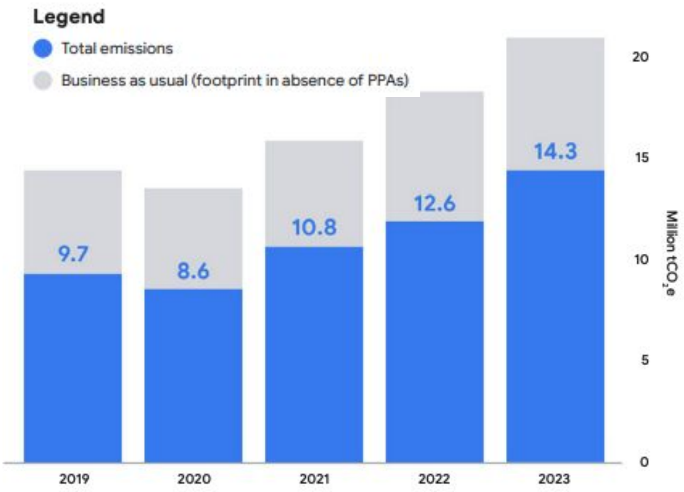


Behind-the-meter resources as backup and supplemental power

Source: Sunlogix

Tariff elements to accommodate the diverse needs of large-load customers

Clean energy requirements



Source: Google

Opportunities to leverage specific generation technologies

Source: Google

State actions

Requiring additional information for load forecasts

- Georgia PSC staff recommended the Commission:
- Continue providing quarterly large load economic development reports. In addition to the data currently provided in the quarterly reports, the Company should provide the following additional information:
  - The quarter in which the project entered the large load pipeline,
  - The announced load of the project when it first entered the large load pipeline,
  - Whether the customer is considering sites outside of Georgia, and
  - A description and quantification of financial commitments provided by each large load customer.

Informational proceedings (1)

- New Mexico PUC opened an inquiry docket (2024) to evaluate grid readiness and economic development (Docket 24-00257-UT).
- The Commission required the utilities to respond to 13 questions to examine the utility's ability to meet new load from customers larger than 500kW. They subsequently issued 17 follow-up questions on the focused utility readiness to serve new demand and potential barriers to serving new demand, broken into three areas:
  - Integrated resource planning
  - Certificates of Public Convenience and Necessity (CPCN) and
  - Other commission rules

TABLE 1.1

Pros and Cons of Adopting All Utility Proposals for IRP, CCN, and Other Regulatory Changes

Issue	Pros	Cons
IRP Rule Amendments (17.7.3 NMAC) Adopting utility proposals for concurrent IRP/RFP filing, 60-day Statement of Need, 105-day acceptance, mid-cycle RFPs, defined Material Event criteria (e.g., 30-day review, post-notice process, non-material RFPs), prudence presumptions, and single IRP process (Inquiries i, ii, iii, iv, xvi).	- Accelerates resource planning (from 24-33 months) for large loads, enabling timely economic development (e.g., oil and gas sector). - Defined Material Event criteria (e.g., PNM's 30-day review, EPE's post-notice updates) clarify off-cycle procurement, reducing delays. - Mid-cycle RFPs with 15-day IM checks and prudence for 17.7.3.12/14 portfolios expedite CCN/PPA filings, enhancing reliability. - Single IRP avoids duplicative planning, maintaining stakeholder transparency while supporting ratepayer cost control.	- Shorter timelines (e.g., 60-day review) may reduce oversight, risking imprudent resource choices impacting ratepayers. - Mid-cycle RFPs without full review could bypass stakeholder input, potentially prioritizing large loads over existing customers. - Prudence presumptions may limit Commission scrutiny, increasing ratepayer exposure to costly projects if not rigorously defined. - Single IRP may undervalue zone-specific needs, delaying targeted infrastructure for high-demand areas.

Source: NM PUC Staff. Docket 24-00257-UT

Informational proceedings (2)

- Pennsylvania PUC requested responses (2025) to 14 questions on the design of a large load customer model tariff (responses were due June 6).
  - The questions posed to consumer advocates include:
    - What safeguards do you believe are essential to prevent cost-shifting from speculative or short-lived data center investments onto existing ratepayers?
    - How can we ensure tariff structures are transparent enough to allow meaningful public input on what constitutes fair cost allocation, especially when commercial contracts are confidential?
- The Virginia SCC held a technical conference (2024) examining Informational proceeding on rate impacts and tariff designs due to the interconnection of data centers.
  - The Commission heard presentations from SERC, IOUs, co-ops, hyperscalers, local government and advocacy organizations, among others.

Informational proceedings (3)

- Arizona Corporation Commission (ACC) opened a docket (2025) to review existing rate classifications and explore creating more transparent rates for data center customers and the public.
- The ACC identified other topics that may be discussed in the docket including:
  - “Review of utility mechanisms being implemented with data center customers,
  - behind-the-meter and in-front-of-the-meter solutions,
  - User-funded utility scale generation to help large customers such as data centers meet their power needs”
- North Carolina required Duke Energy to file a report on large loads, opened a proceeding to receive information and recommendations as how to fairly and efficiently integrate large electric load additions (comments due in July) and will hold a technical conference in October 2025.

Studies on the impact of large energy consumers

- North Dakota (2025) passed a law requiring the Legislative Management to study the impact of large energy consumers, including data centers, on the electricity grid.
  - It will evaluate grid reliability and infrastructure requirements, regulatory consistency throughout the state, economic impacts, costs and impacts of regulated and exempt utilities and regulatory and exemption criteria (among other topics).

- Virginia published the Joint Legislative Audit and Review Commission study reviewing the impacts of the data center industry in the state (2024).
  - Policy recommendations included to consider:
    - Requiring utilities to establish a demand response program and require data centers to participate in the program
    - If utilities have the authority to delay service (but not deny) to customers if load cannot be supported by the transmission or generation capacity.
  - The report included a review of rate impacts of data centers in Virginia by E3 (see next slide).

Virginia rate impacts study

The Virginia Joint Legislative and Audit and Review Committee commissioned a study examining “electricity system infrastructure and associated investments costs, under a wide range of potential data center-driven load growth scenarios” to “determine if current rate and fee structures lead to equitable distribution of costs between data centers and other customers.”

Approach to Assessing Rate Impacts

Utility tariffs and cost-of-service studies informed how cost shifting may occur with escalating forecasts of costs and load

1. **Relevant tariffs for each utility were reviewed to determine current methods of revenue collection**
2. **Cost-of-service studies were examined to determine basis of volumetric and fixed costs**
3. **Compare volumetric revenue and cost components against each other and across rate classes**
4. **Calculate total cost and revenue by rate class using load forecast data**
   - Determine where total cost/revenue values do not align within classes
5. **Compare and highlight specific impacts for Residential customers served by Dominion Virginia under various cost recovery scenarios**
   - Extension of existing cost allocations
   - Updated cost allocations using current methodology to adapt to anticipated load growth

Revenues	
Values	**Description**
$ / kW	Demand charges (if applicable)
$ / kWh	Delivery + supply + other volumetric adders
Fixed charges	Customer or minimum monthly charges
Data Sources	Utility Tariffs

Costs	
Values	**Description**
$ / kW	Capacity-driven investment / Coincident demand
$ / kWh	Consumption-driven costs (e.g., generation)
Fixed costs	Utility billing, overhead, etc.
Data Sources	Project forecasts, cost of service studies, etc.

Leveraging state resources and supporting economic development (1)

- Colorado law (2025) allows transmission developers to co-locate within a state highway right-of way, and requires the state Department of Transportation to provide transmission developers "the best available information" on potential future state highway development plans that could impact (i.e., be suitable for) the placement of transmission lines in the state highway right-of-way.
- New Mexico (2025) authorizes the commission to approve utility applications for special rates to attract new customers and promote economic development. The law requires that the special rates or tariffs must be designed to recover at least the incremental cost of providing services to the customer.
- West Virginia (2025) built on its Certified Microgrid Development program to attract data centers to the state, and requires the Department of Commerce to assist projects in developing or operating a certified microgrid.
  - Local governments can not slow the creation of a certified microgrid

Leveraging state resources and supporting economic development (2)

- Pennsylvania – offers fast track permitting data centers program and plans for legislation to accelerate Department of Environmental Protection permitting for data centers
- Kansas created sales tax exemption on goods to build and equip data centers
- Kentucky and Arkansas expanded pre-existing data center tax exemptions
- Michigan created sales tax exemption with consumer protections
- Utah (see next slide) and Oklahoma made it easier for data center developers to procure their own power supply without going through grid
- South Carolina eased regulations to build power plants to meet demand for data centers

Utah

- Establishes alternative processes for providing electric service to customers with large electrical loads

- Creates procedures for submitting, evaluating, and contracting for large-scale electrical service requests between utility and large load customer

- Requires the commission to conduct proceedings to establish transmission cost allocation and feasibility of a large load flexible tariff

- Requires large load customers to pay incremental costs necessary to receive electric service including generation resources, distribution system upgrades, transmission system improvements and service and other infrastructure costs

- Requires the commission to conduct periodic reviews of the program and report to the Legislature.

Pending legislation

- Oregon HB3546 requires utilities to enter into 10 year (minimum) contracts with large load retail customers and obligate them to **pay a minimum percentage of their projected** usage (passed into law in June). Georgia is debating similar bill.

- California SB57 requires the PUC to create a special tariff for customers connecting to the transmission system (50kV or higher) that requires eligible customers to **site distributed energy resources storage systems and back-up power systems**, and can establish minimum requirements for zero carbon procurement.

- Texas SB6 requires the PUC to establish standards for large load electricity users in ERCOT on interconnection and cost recovery (among other topics). Examples include:
  - Disclose information about back-up generation that can provide 50% of customer load, and may be required to use back-up generation or curtail load during energy emergencies
  - Requires large load interconnections that occur after 2025 allow load to be curtailed during firm load shed
  - Requires creation of long-lead demand response program, compensating large loads that reduce demand with 24 hours' notice during grid emergencies.
  - Evaluate whether the current methodology, including the Four Coincident Peaks (4CP) methodology, for allocating transmission costs by transmission and distribution utilities in the ERCOT power region results in a just and reasonable cost allocation.

Resources for more information

- LBNL, Electricity Rate Design for Large Load: Evolving Practices and Opportunities
- Energy Systems Integration Group (ESIG) Large Load Task Force
- National Electric Reliability Council Large Load Task Force
- RMI, Get a Load of This
- Grid Strategies, Strategic Industries Surging: Driving Up US Power Demand
- Harvard, Extracting Profits from the Public: How Utility Ratepayers Are Paying for Big Tech's Power
- EFG, Review of Large Load Tariffs To Identify Safeguards and Protections for Existing Ratepayers
- GridLab, Practical Considerations for Large Load Interconnections

Thank you

Contact

Natalie Frick

nfrick@lbl.gov

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