POWERING TEXAS' DIGITAL ECONOMY: DATA CENTERS AND THE FUTURE OF THE GRID

Part One

HARC

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TERMS

Data Center	A physical facility that houses computing infrastructure like IT equipment and servers
Hyperscale	A very large data center facility, characterized by high performance, efficiency and volume of computation.
Interconnection	The process through which an energy resource is connected to the electricity grid.
IoT	Internet of Things. A network of physical “smart” devices that can collect and share data
Load	A component that requires or consumes energy. Load growth refers to increasing demand for energy.

INTRODUCTION

Texas is rapidly becoming a national hub for data center development, with Dallas, Texas being ranked the second hottest data center market in the United States.[1] As of April 2025, Texas hosts over 400 data center facilities concentrated in 5 regions:

- Dallas / Fort Worth (196)
- Houston (43)
- San Antonio (56)
- Austin (50)
- West Texas (59)

Collectively, these data centers currently require approximately 8,152 megawatts (MW) of electricity and, with approximately 90 more facilities under construction, this demand that is set to scale in the coming years.[2]

Data center investment brings enormous economic opportunity to the state, but also significant challenges for the electric grid, and for natural resources. Without proactive planning and an integrated policy framework for data centers, their unchecked expansion could strain Texas' infrastructure and jeopardize progress towards a reliable, sustainable and resilient energy system.

INTRODUCTION

Powering Texas' Sustainable Digital Economy: Data Centers and the Future of the Grid explores the state of play for data centers in Texas, assesses their growth and potential impact, and provides insight into policy needs to ensure the sustainable growth of data centers in the state.

Part One in the series presents an introductory look at the factors that have led to rapid data center growth in Texas as well as the different data center types and how they operate. Part Two will draw upon the University of Houston's recent analysis[3] on projected data center growth in Texas over the coming decades, discuss their impacts, and outline actionable recommendations that lay the foundation for a sustainable future for data centers.

OPERATION

A data center is a physical facility that houses computing infrastructure, including servers, storage devices, and computational and networking equipment, to store and manage digital operations and data. In this manner, data centers serve as a central location for IT systems, allowing for easier maintenance, cost efficiency, scalability, and enhanced security. Given their magnitude, a data center's development and operational needs are substantial, impacting energy, water and land use.

Data centers may exhibit flexible load profiles, with electricity consumption varying based on the nature of the customer, workload demands, function and scale of operations, and the technology used. Table 1 presents a summary of predominant data center types.

80,000

A large hyperscale data center can consume the same energy as about 80,000 U.S. households annually.[4]

TABLE 1. DATA CENTER TYPOLOGIES & THEIR CHARACTERISTICS

Data Center Type ⇩ / Feature ⇨	Hyperscale	Co-located	Enterprise	Edge	High-Performance Computing
Typical Customer	Large Companies	Multiple customers sharing the facility	Single consumer for internal business use	Mobile, Media and Entertainment, IoT, Streaming and Gaming	Research organizations, universities, & businesses
Load Profile Consistency	High, typically operate at near full capacity continuously, 24X7	Variable load patterns	Moderate, with higher load through business hours	Predicated upon local demand	Sharp peaks, computation-intensive loads
Power Demand	Very High 20 - 100+ MW	High 1 - 20 MW	Medium 500 kW - 5 MW	Low 100 kW - 1 MW	Medium-High 5- 50+ MW
Load Shifting Flexibility	Low	Moderate	Moderate	High	Variable
Cooling Needs	Constant	Moderate	Moderate	Variable	High

DATA CENTER IMPACTS

Data centers are resource intensive operations, and they are growing in size, scale and number. The industry will impact multiple facets of Texas' energy system, and its natural resources, in a time when reliability and resource availability are key concerns for Texans and policymakers.

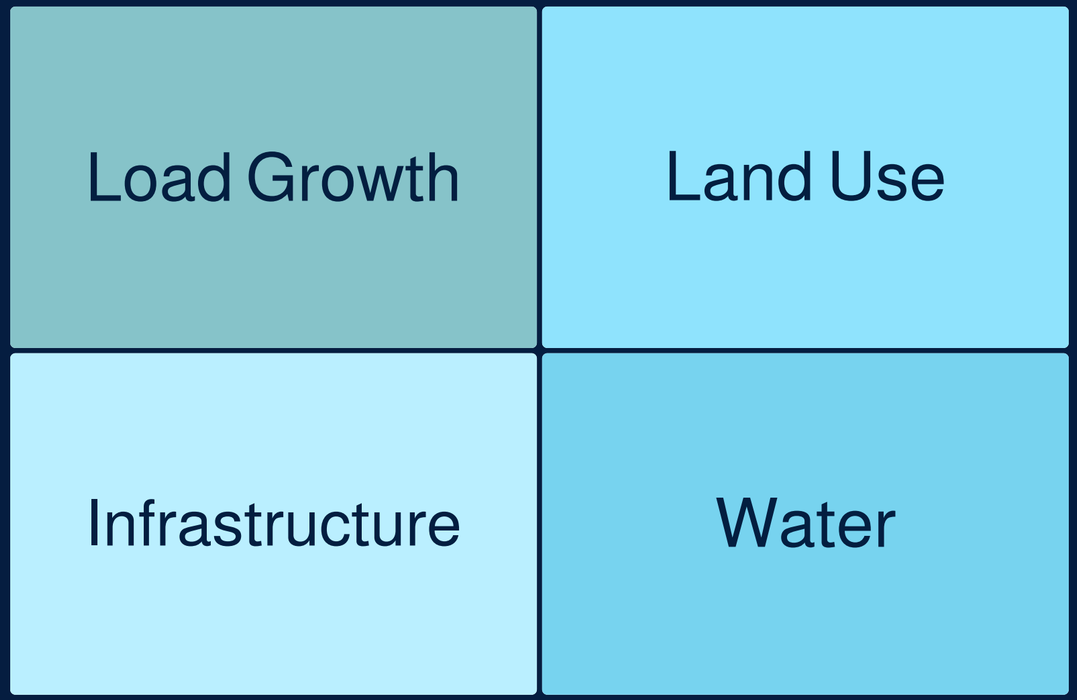

Figure One. Factors impacted by data center growth

DATA CENTER CATALYSTS

Texas' longstanding history of energy innovation and leadership now extends into the age of artificial intelligence and the data center boom. As of 2022, Dallas, Texas, boasted the second-most data centers in the country. This achievement did not occur in a vacuum; this prodigious growth is due to the convergence of several factors.

LAND AVAILABILITY

Texas is able to meet the large demand for undeveloped and available land to accommodate data centers and hyperscale facilities, lowering barriers to procurement and development.

GEOGRAPHY

Texas' central location in the country allows it to serve both the East and West coasts, providing ease of access and a geographic advantage for companies with footprints spanning the country or globe.

DATA CENTER CATALYSTS

ENERGY

Many major data center developers are often large buyers of energy. As developing and energizing new energy resources stagnate in markets throughout the United States, procuring sufficient quantities of energy is a rising challenge. However, the majority of Texas is served by the Electric Reliability Council of Texas (ERCOT), a market offering an abundant and growing cache of energy due, in part, to its relatively quick interconnection process. What's more, Texas energy is cost-competitive. The average cost of electricity for the commercial sector in Texas is about 30% lower than the national average, resulting in lower operating costs for data centers.

FIBER OPTIC INFRASTRUCTURE

Though statewide fiber optic coverage lags behind other states (~10%), coverage in specific areas of the state is substantial. Major metropolitan areas are proactively expanding their robust network of fiber optic infrastructure to facilitate the growth of the industry. This infrastructure investment is being supported by innovative funding mechanisms, like in Fort Worth, Texas, where the city has initiated public-private partnerships to achieve 100% fiber optic connectivity.[5]

DATA CENTER CATALYSTS

SUPPORTIVE BUSINESS POLICY

Texas offers a low tax burden, lower operational costs, and light regulations and incentive programs to help business creation, expansion, relocation, and workforce training. The state also provides a sales tax exemption on equipment and electricity for data centers that span at least 100,000 square feet, invest $200 million, and employ 20 people at wages that exceed the average county wage.[6]

While these pro-business policies have encouraged data center investment, robust policy frameworks related to planning, reporting and sustainable use of resources remains to be developed.

CONCLUSION

Texas stands at a pivotal juncture where the rapid expansion of data centers presents both significant economic opportunities and sustainability challenges. As detailed in Part One of Powering Texas' Digital Economy: Data Centers and the Future of the Grid , the state's abundant land, favorable regulatory environment, and competitive energy prices have positioned it as a prime destination for data center development. However, this growth intensifies demands on the electric grid and natural resources, potentially straining infrastructure and impacting future availability of resources in the absence of a holistic policy framework.

Part Two will delve deeper into projected data center growth trajectories, and examine their multifaceted impacts. It will also propose actionable policy recommendations aimed at guiding Texas toward a sustainable path that balances technological advancement with real world constraints.

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