



COMPASS
Collaborative Optimization & Management of Power
Allocation – Surface & Subsurface strategies



BUREAU OF
ECONOMIC
GEOLOGY



The University of Texas at Austin
Jackson School of Geosciences



The University of Texas at Austin
Energy Institute



The University of Texas at Austin
Kay Bailey Hutchison Energy Center



Infrastructure
Masons

SUSTAINABLE DATA CENTER IN TEXAS WORKSHOP

Let's discuss key opportunities and gaps in sustainable data center development in Texas.

SEPTEMBER 18, 2025

8:00 AM – 7:30 PM

Bureau of Economic Geology

10611 Exploration Way,
Austin, TX 78758

About the Workshop and This Report – A Message from the COMPASS

The Workshop on Sustainable Data Center Growth in Texas, held on September 18, 2025, brought together industry leaders, policymakers, researchers, and technology providers to examine the challenges and opportunities of building resilient data center infrastructure in Texas. Discussions focused on system reliability, infrastructure readiness, resource constraints, and the coordination required to support rapid large-load growth. This report highlights notable moments from the event, including remarks from COMPASS leadership, major takeaways from panel discussions and speakers, and select photos.

During the workshop, we officially launched the COMPASS Research Consortia, our affiliates program connecting industry partners, policymakers, and researchers to advance data-driven insights in energy, infrastructure, and sustainability. The consortia provide a platform for collaboration, knowledge exchange, and joint initiatives that support resilient and efficient growth of digital infrastructure in Texas. Learn more at compass.beg.utexas.edu.

Prepared by

COMPASS Research Affiliates Program at the University of Texas at Austin,

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Welcome and Opening Remarks

Dr. Lorena G. Moscardelli

Director, Bureau of Economic Geology, The University of Texas at Austin, and State Geologist of Texas

The *Sustainable Data Centers in Texas* Workshop marked an important moment for Texas, convening leaders, innovators, and stakeholders to address how rapid digital infrastructure growth can be aligned with sustainable energy, resilient infrastructure, and responsible resource management.

About the Bureau of Economic Geology

Established in 1909, the Bureau of Economic Geology is one of three units at the Jackson School of Geosciences, the oldest and second-largest research unit at UT Austin. We also serve as the State Geological Survey of Texas. For over a century, we have provided independent, science-based insights that inform public policy, industry practices, and academic research. Our work spans energy, environmental research, water resources, and, increasingly, the intersection of geosciences and technology. The Bureau's research and outreach have helped Texas remain at the forefront of responsible resource management and economic growth.

On the Importance of the First Workshop

Our mission is deeply embedded within the university's commitment to advancing knowledge and serving society. As Texas faces rapid growth in digital infrastructure, the Bureau's expertise in land, water, and energy resources is more relevant than ever. We are proud to support UT's leadership in research and innovation, and to contribute to the state's efforts to ensure that economic development is both sustainable and inclusive. We truly operate in the intersection of energy, the environment, and economics.

Texas is experiencing a data center boom, driven by our robust economy, abundant resources, and strategic location. But with opportunity comes responsibility. Data centers present both opportunities and challenges, shaping electricity demand, water use, land development, and grid reliability.

This workshop brought together experts from government, industry, and academia to explore approaches to energy integration, infrastructure planning, workforce development, and cross-sector collaboration. Through data-driven planning, we aim to ensure that the benefits of digital infrastructure are shared broadly across Texas communities.

Introducing COMPASS: A New Bureau Initiative

I'm especially excited to share that the Bureau has launched a new initiative: the COMPASS program—*Collaborative Optimization & Management of Power Allocation: Surface & Subsurface strategies*. This innovative consortium, led by our Chief Economist, Ning Lin, is designed to provide optimized strategies for power allocation and sustainable infrastructure by integrating surface and subsurface analysis. COMPASS brings together industry, communities, and policymakers to address the challenges of large-load growth, like data centers, oil and gas, and advanced manufacturing, through collaborative, data-driven planning and scenario-based decision-making. COMPASS is more than a research program; it's a collaborative forum for strategic planning, outreach, and smarter infrastructure development.

Sincerely,

Dr. Lorena G. Moscardelli

Director, Bureau of Economic Geology, and State Geologist of Texas

Opening Session Highlights

Data Center Growth in Texas Workshop

We kicked off the September 18 *Sustainable Data Centers in Texas* Workshop at the Bureau of Economic Geology with inspiring opening remarks and keynote addresses that framed the challenges and opportunities of Texas's rapidly expanding digital infrastructure.

Keynote Speakers

Representative Drew Darby

*Chairman, House Committee on Energy Resources
Texas House of Representatives, District 72*

Chairman Darby emphasized that Texas sits at the center of the digital economy's transformation and highlighted the Legislature's role in strengthening energy systems, infrastructure, and policies to ensure growth that is resilient, responsible, and inclusive.

Dan Stanzione

*Executive Director & Associate Vice President
Texas Advanced Computing Center (TACC)*

Dr. Stanzione offered a compelling look inside TACC, where supercomputing and artificial intelligence are pushing the boundaries of scale. He highlighted how AI infrastructure is reshaping global energy demand and the urgency of efficiency, innovation, and partnerships to keep Texas at the forefront.

Together, their remarks set the stage for a day focused on energy, land, water, and community priorities, and how Texas can meet its digital infrastructure boom with science-based, resilient solutions.

Sustainable Data Center in Texas Workshop September 18, 2025

Keynote Speech



Drew Darby
Chairman
Texas House District 72



Panel 1: Texas Data Center Boom

Site Selection, Investment, and Infrastructure at Scale



Panel 1 of the *Sustainable Data Centers in Texas* Workshop discussed the structural drivers behind Texas's rapid expansion as a hub for large-scale data centers and AI infrastructure. The discussion focused on how site selection, capital investment, and supporting infrastructure interact to shape development outcomes at unprecedented scale.

Panelists emphasized that Texas's competitive advantages—power availability, land access, and regulatory environment—are increasingly tested by the pace and magnitude of new demand.

Key Insights:

- **Scale of development:** Gigawatt-scale campuses are transitioning from concept to execution, with individual projects exceeding \$10–15B in capital investment.
- **Power-driven siting:** Access to large-scale, reliable, and cost-effective electricity has become the primary determinant of site selection.
- **Infrastructure planning:** Long-term, master-planned campuses are replacing single-facility builds, offering greater stability for local communities and public infrastructure.
- **Resource constraints:** Water availability and cooling strategies are emerging as critical considerations alongside power and land.
- **Workforce pressures:** Development timelines are increasingly constrained by skilled labor availability, reinforcing the need for coordination with education and training institutions.

Expert Panelists

Santiago Suinaga

Moderator, Chief Executive Officer, Infrastructure Masons

Phillip Marangella

Chief Marketing Officer, EdgeConneX

Miranda Gardiner

Executive Director, iMasons Climate Accord

Chris Dolan

Chief Data Center Officer, Crusoe

Phillip Sandino

Senior Vice President, Tract



Panel 2: Electricity Markets and Grid Integration

Managing Large-Load Growth in a Rapidly Evolving Power System



Panel 2 of the *Sustainable Data Centers in Texas* Workshop examined electricity markets and grid conditions, which are often described as the “outside-the-building” factors shaping the future of large-scale data center growth in Texas. The discussion focused on how accelerating demand from data centers, artificial intelligence, and crypto assets is interacting with ERCOT’s market design, interconnection processes, and generation mix.

Panelists emphasized the unprecedented scale of projected load growth. ERCOT’s interconnection queue currently includes approximately 189 GW of large-load requests, driven largely by data centers and AI infrastructure.

Key Insights:

- **Interconnection pressure:** The volume of large-load requests is reshaping planning timelines and grid coordination across ERCOT.
- **Renewable growth:** Texas has deployed approximately 32 GW of solar and 14 GW of battery storage, with nearly 90% of this capacity added since 2020.
- **Dispatchable generation:** Natural gas remains essential for reliability, particularly during evening ramp-down periods when solar output declines.
- **Hybrid systems:** New projects increasingly combine solar, storage, and gas to balance cost, reliability, and flexibility.
- **System evolution:** ERCOT’s market and operational processes are adapting in real time to unprecedented demand growth.

Expert Panelists

Beth Garza

Moderator, Senior Fellow, R Street Institute

Jeff Billo

Vice President of Grid Planning, ERCOT

Steve Bruns

Vice President, Tenaska Marketing Ventures

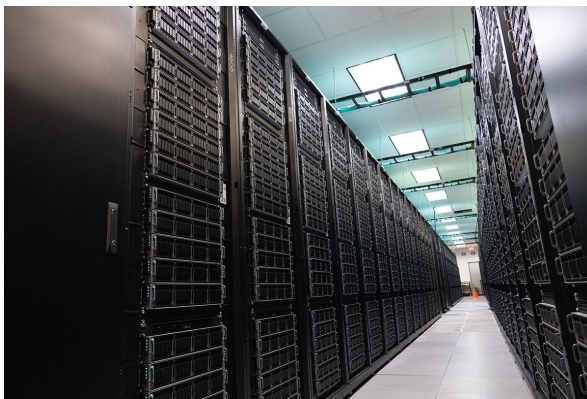
Mark Stover

Executive Director, Texas Solar + Storage Association



Panel 3: Balancing Land, Water, and Energy

The Resource Equation Behind Data Centers



Panel 3 discussed how rapid large-load growth intersects with land, water, energy systems, and integrated planning can support balance rather than trade-offs. As data center development accelerates across Texas, the discussion emphasized the importance of system-level thinking to ensure sustainable infrastructure outcomes.

Panelists explored how water use in data centers can be recontextualized through alternative and reclaimed water sources, noting that strategic partnerships may enable facilities to become net contributors to local watersheds. The conversation also addressed the importance of aligning data center expansion with power-sector decarbonization, emphasizing the need for clean, additional electricity supply while protecting ratepayers and minimizing localized environmental impacts.

Key Insights:

- **Water systems:** Reclaimed, alternative, and non-potable water sources can reduce stress on freshwater supplies and support watershed resilience.
- **Energy alignment:** Coordinating data center growth with clean and dispatchable generation is critical for decarbonization and grid stability.
- **Land co-use:** Agrivoltaics and shared land-use models offer opportunities to integrate agriculture and energy production while delivering community benefits.
- **System integration:** Circular resource use and cross-sector coordination can reduce inefficiencies across energy, water, and land systems.
- **Innovation capacity:** Texas's scale, infrastructure, and innovation ecosystem position the state to lead in addressing complex energy–water–land challenges.

Expert Panelists

Marilu Hastings

Moderator, Executive Vice President, The Cynthia and George Mitchell Foundation

Ian Lloyd

Director, Environmental Defense Fund

Michael M. Obradovitch II, Esq.

Vice President, Ecolab

Brent Huwa

Chief Executive Officer, Huwa Enterprises

Michael Young

Associate Dean, Jackson School of Geosciences, The University of Texas at Austin



Panel 4: Workforce & Inclusive Growth

The Human Side of Data Centers



Panel 4 of the *Sustainable Data Centers in Texas* Workshop focused on workforce development and inclusive growth, highlighting how data center expansion intersects with communities, skills development, and regional prosperity. Panelists examined strategies to ensure that the rapid growth of digital infrastructure in Texas generates sustainable benefits for local populations. The panelists emphasized actionable approaches to workforce readiness, education-to-industry pathways, and community infrastructure planning.

Key Insights:

- **Workforce readiness:** High demand for skilled trades across Texas and the Permian Basin presents both opportunities and challenges.
- **Education pipelines:** Early connections between schools and local industries are critical to long-term talent development.
- **Community infrastructure:** Housing, healthcare, and childcare are essential components of sustainable workforce growth.
- **Policy alignment:** Coordinating data center development with broader energy, grid, and workforce strategies ensures systemic benefits.
- **Economic value:** Inclusive growth supports enduring tax bases, improved broadband, and regional reinvestment when companies collaborate with communities.

Expert Panelists

Dean Foreman

Moderator, Chief Economist, Texas Oil & Gas Association

Kristen Gamboa

Executive Director, City of Carlsbad Department of Development

Garrett Golding

Vice President, Federal Reserve Bank of Dallas

Brian Korgel

Professor, Energy Institute, The University of Texas at Austin



Panel 5: Policy, Planning & Texas's Path Forward

Shaping Resilient Data Center Growth



Panel 5 tackled the policy and planning frameworks essential for managing large-scale load growth while ensuring reliability, equity, and resilience. The discussion emphasized how Texas can align industrial development with public interest and long-term resource management. The discussion highlighted the importance of communication between agencies, proactive planning, transparent interconnection processes, and collaborative approaches with local communities.

Key Insights:

- **Proactive planning:** Large loads are arriving faster than traditional infrastructure timelines, requiring coordinated strategies across utilities, regulators, and local governments.
- **Grid reliability:** Transmission investment and regional stress monitoring must keep pace with economic growth.
- **Community collaboration:** Early engagement ensures industrial demand aligns with local priorities, land use, and water resources.
- **Policy innovation:** Data-driven, adaptive policies and integrated resource planning are critical for success.
- **Public-private alignment:** Bridging private-sector innovation with public-sector planning fosters trust, transparency, and long-term investment certainty.

Expert Panelists

Mark Shuster

*Associate Director, Bureau of Economic Geology,
The University of Texas at Austin*

Chairman Jim Wright

Railroad Commission of Texas

Commissioner Kathleen Jackson

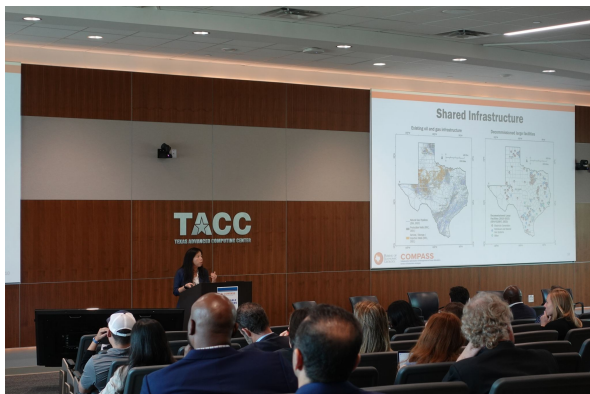
Public Utility Commission of Texas

Ty Schmitt

Vice President, Dell Technologies, ISG-CTO



COMPASS Launch & Concluding Remarks



Ning Lin Launches COMPASS

“Our goal is to bring all the players to the table,” said Dr. Ning Lin, the principal investigator of COMPASS and chief economist at the Bureau of Economic Geology. “We will help everyone achieve a validated, robust level of knowledge and insights through data-driven research across the value chain.”

This new Industrial Affiliates Program is designed to support the sustainable growth of the data center industry in Texas. As AI and cloud computing drive unprecedented demand for large-scale, power-intensive facilities, COMPASS aims to help industry partners, regulators, and communities make informed decisions about siting, energy use, water allocation, and broader infrastructure planning.

The consortium brings together experts from multiple disciplines — geoscientists, engineers, economists, and energy modelers — alongside industry leaders and policy makers. Through this collaborative framework, COMPASS provides actionable insights and validated knowledge for designing efficient, resilient, and environmentally responsible digital infrastructure.

COMPASS is now one of 15 research consortia under the Bureau’s Industrial Affiliates Programs, which have a long tradition of connecting UT scientific expertise with industry challenges.

Dean Claudia Mora Concludes

At the Data Center Growth in Texas Workshop, Dr. Claudia Mora, Dean of Jackson School of Geosciences at the University of Texas at Austin, closed the event with reflections on the role of geosciences in shaping the digital future.

Dean Mora highlighted the importance of geoscience expertise and collaboration across sectors to ensure that infrastructure development is resilient, sustainable, and forward-looking. Several key objectives of the program:

- **Data-Driven Planning:** Leverage detailed surface and subsurface data to guide strategic siting of data centers and other large-load facilities.
- **Sustainability Integration:** Evaluate water, land, and energy usage holistically to minimize environmental impacts while maintaining operational efficiency.
- **Stakeholder Collaboration:** Facilitate knowledge exchange between industry, regulators, communities, and researchers to align goals and expectations.
- **Knowledge Dissemination:** Share research outcomes through peer-reviewed publications, workshops, and consortia meetings, ensuring broad accessibility and real-world applicability.



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COMPASS is a collaborative, data-driven forum that brings together industry, communities, and policymakers to shape the future of large-load growth through strategic siting, stakeholder engagement, and coordinated decision-making.



CONSORTIUM MISSION

The platform's mission is to provide optimized strategies for power allocation and sustainable infrastructure by applying collaborative optimization and the integrated analysis of both surface and subsurface environments. This approach ensures development aligns with key economic, environmental, and community priorities.

WHY THIS CONSORTIUM MATTERS

Texas is at the center of a surge in large-load development—from data centers and oil and gas to advanced manufacturing, refining, and mining. While these sectors differ in purpose, they all depend on shared systems: the electric grid, water and land resources, transportation infrastructure, and surrounding communities. This convergence creates both risks and opportunities. Without integrated planning, projects may compete for limited capacity, strain local infrastructure, and amplify environmental and social impacts. The Bureau of Economic Geology brings a uniquely broad and deep research capacity to address this challenge. Our expertise spans oil and gas systems, critical minerals, geothermal energy, carbon capture and storage (CCS), hydrogen, nuclear energy, renewables (wind and solar), groundwater, soil systems, and electric grid integration—positioning us to support multi-dimensional,

data-informed planning.

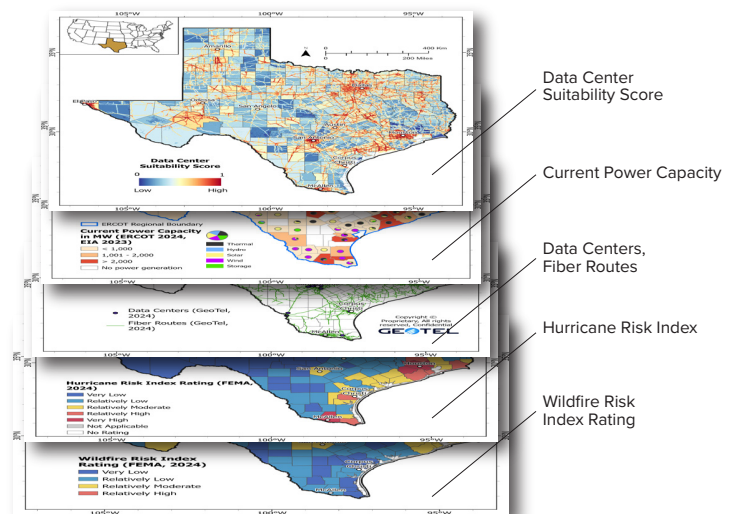
Built on this foundation, the consortium offers a coordinated, cross-sectoral platform for managing large-load growth. We are energy technology-agnostic and focused on delivering sustainable, reliable, and commercially viable solutions for industry, policymakers, and communities. This partnership forms a strategic alliance that enables coordinated and informed decision-making through a platform that continuously evolves with Texas' dynamic energy and resource systems.

SCOPE

The consortium addresses the growing convergence of large-load sectors—data centers, oil and gas, advanced manufacturing, refining, and mining—within shared energy, water, infrastructure, and community systems.

- Forecasting industrial electricity and energy demand
- Integrated infrastructure and resource planning
- Strategic co-location and cross-sector synergy
- Community engagement, education, and workforce support
- Policy advising and regional development alignment

While the initial focus is on Texas, the framework is designed for adaptability to other regions facing similar challenges.





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ACTIVITIES & TASKS

Core activities include:

1. Advanced Load Forecasting

The initial phase focuses on data center development and oil and gas operations. Develop high-resolution projections of industrial electricity demand across sectors, with emphasis on spatial, temporal, and grid implications.

2. Integrated Resource and Infrastructure Management

With broader application to other large-load sectors, conduct geospatial and subsurface analyses for optimal siting, balancing access to energy (e.g., wind, solar, geothermal, natural gas), water, land, and grid infrastructure. Evaluate synergies from co-locating complementary industries.

3. Community and Workforce Integration

Assess local infrastructure readiness (e.g., transmission, roads, water systems) and engage directly with communities to co-develop solutions. Provide trusted advisory support, workforce training pathways, and educational outreach to align development with community priorities and talent pipelines.

4. Environmental and Sustainability Analysis

Apply lifecycle (LCA) and techno-economic (TEA) assessments to quantify and mitigate environmental impacts, water usage, and land tradeoffs across development scenarios.

5. Policy, Planning, and Stakeholder Strategy

Develop actionable insights and recommendations to guide decision-making across industry, communities, and government. Support permitting, engagement, and long-term infrastructure coordination through scenario-based planning and cross-sector dialogue.

CONSORTIUM OUTPUTS

- Detailed, scenario-based forecasting reports, segmented by industry and region.
- A web-based, interactive visualization and mapping database.
- Policy briefs and strategic recommendations for industrial load planning, community integration, and environmental alignment.
- Access to student research program and community-based pilot projects.
- Educational outreach materials and tours to support community outreach and policy alignment.

MEMBERSHIP & FEES

\$50,000 annual membership

Selected communities may access research outputs, technical support, and planning insights through in-kind engagement or advisory participation.

JOIN THE CONSORTIUM

This consortium is more than a research program—it is a **collaborative forum and platform** for strategic planning, outreach, and data-driven decision-making. By connecting **industry, government, NGOs, and communities**, we support smarter infrastructure development and sustainable, inclusive growth.

For more information, contact
compass@beg.utexas.edu

This industrial consortium framework provides a robust foundation to address Texas' growing industrial electricity demand and resource management challenges, ensuring sustainable and inclusive economic development.

Acknowledgments

The success of the Data Center Growth in Texas Workshop would not have been possible without the dedication, expertise, and contributions of many colleagues, collaborators, and speakers. We extend our sincere gratitude to all panelists, moderators, presenters, and attendees for sharing their insights and expertise, which were central to the workshop's impact.

We are particularly grateful to the Bureau of Economic Geology's leadership—Dr. Lorena G. Moscardelli, Dr. Mark Shuster, Jay Kipper, and Dr. Ning Lin—for their guidance and support throughout the planning and execution of the event. We also thank Infrastructure Masons leadership, Santiago Suinaga, Gina Pierangela Bonatti, and Miranda Gardner, for co-hosting the workshop and for their invaluable contributions to its success.

Special recognition is owed to Cindy Kralis, whose meticulous management and attention to detail—from coordinating the website to arranging event logistics—ensured a seamless experience for all participants. We also thank our organizing team, including Dr. Ning Lin, Dr. Mariam Arzumanyan, Dr. Tingwei “Lucy” Ko, David Chapman, Edna Rodriguez Calzado, Dr. Nur Schuba, Dr. Jani Das, and Dr. Yashvi Malhotra, whose efforts were instrumental in making the workshop possible. Additional collaborators, Roxana Darvari and Andy Young, provided invaluable support in documentation and note-taking for this report.

We deeply appreciate the guidance and support of Dr. Brian Korgel, Dr. Marek Locmelis, Dr. Kasey Faust, Dr. Vaibhav Bahadur, Dr. Bridget Scanlon, Dr. Justin Thompson, Dr. Ken Wissian, Dr. Seyyed Hosseini, Linda McCall, and Mark Blount from the University of Texas at Austin. Our colleagues at the Texas Advanced Computing Center (TACC), the Energy Institute, and the Cockrell School of Engineering also contributed critical technical expertise.

We extend thanks to the Bureau's Media Production Services team for their support in capturing the event and creating media elements. Special thanks to Valerie Tran for her tireless work in producing media content and photography, and to Anton Kaputo, Monica Kortsha, and Robin Berghouse for their contributions to photography, social media, and media production guidance.

Finally, we acknowledge the many volunteers from the Bureau and the TACC who assisted during the event and the TACC data center tour. We are grateful to our knowledge partners, Infrastructure Masons, for co-hosting the workshop, and HuWA Enterprises for their generous donation. Most importantly, we thank everyone who attended and participated, contributing to a truly engaging and impactful event.

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Photos of the Day







