ELECTRICITY CUSTOMER ALLIANCE

Written Testimony of Tom Hassenboehler
Chair, Advisory Council, Electricity Customer Alliance

Before the

House Committee on Energy and Commerce, Subcommittee on Energy, Climate, and Grid Security

"Powering AI: Examining America's Energy and Technology Future"

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Subcommittee Chairman Jeff Duncan, Subcommittee Ranking Member Diana DeGette, Committee Chairwoman Cathy McMorris Rodgers, Committee Ranking Member Frank Pallone, and distinguished members of the Subcommittee, thank you for the opportunity to provide testimony this morning exploring "Powering AI: Examining America's Energy and Technology Future." This topic is critical to the future of America's economy, and I applaud the Subcommittee for holding this timely hearing.

My name is Tom Hassenboehler, and I am the Co-Founder and Managing Partner at CO2EFFICIENT. I also chair the Advisory Council for the Electricity Customer Alliance (ECA).

A New Paradigm – Growing Load and a Growing Grid is Good for America

The global economy is facing a changing paradigm, one where customers across the world are demanding the newest digital goods and services. This presents an opportunity for the U.S., home to many of the companies driving this transformation, to lead the digital economy.

Spurred by the growth of this new, digital economy, the resurgence and reshoring of domestic manufacturing, and electrification of the transportation sector and buildings, the U.S. is also experiencing a new paradigm. This resurgence is boosting economic development, increasing the number of high-quality jobs, and addressing the imbalance within our existing supply chains.

In the industrial sector, manufacturers contributed a record $2.89 trillion at the annual rate to the U.S. economy during the fourth quarter of last year.[1] In February 2024, there were nearly 13 million manufacturing workers.[2] And, according to an April 2024 article from the Deloitte Research Center for Energy & Industrials, the number of manufacturing facilities in the U.S. grew by more than 11%

[1] "Facts About Manufacturing: The Top 18 Facts You Need to Know," National Association of Manufacturers, *https://nam.org/manufacturing-in-the-united-states/facts-about-manufacturing-expanded/#:~:text=1.,U.S.%20economy%20in%20Q4%202023.&text=2.,%242.69%20to%20the%20overall%20economy*

[2] National Association of Manufacturers, *supra* note 1

between the first quarter of 2019 and the second quarter of 2023.[3] This translates to more than $481 billion in commitments for industrial and manufacturing facilities since 2021.[4]

In addition, the growth of artificial intelligence (AI), which burst into the public consciousness over the past couple of years, has already become a major economic driver. That being said, digital infrastructure, including AI, is underpinned by electrical infrastructure. One does not exist or grow without the other.

Looking ahead, we have an opportunity to foster the continued resurgence of American manufacturing, modernize the grid, and cement the U.S. as the leader of the new AI economy. In short, load growth and a growing grid are good for America.

Demand growth is resulting from a variety of factors, including not just the expansion of data centers to support AI operations, but also the reshoring and resurgence of manufacturing, and the increased electrification of transportation and buildings. While AI appears to be a minority of total load growth, it shares the fate of all load growth drivers. That is, policies affecting electricity infrastructure are woefully inadequate to handle new growth reliably and cost-effectively.

The world has taken note, and our economic rivals are furiously trying to catch up and surpass us. The only way they can is if the U.S. slows down or if our infrastructure cannot keep pace with this new economy. Now, we need to ensure that we are positioned to seize this opportunity.

Data centers underpin the U.S.' digital infrastructure and thereby our digital economy. The data center industry's total annual impact on U.S. value added grew from $355 billion in 2017 to $486 billion in 2021.[5] These numbers are only anticipated to increase as data center growth is forecast to "exceed $150 billion through 2028."[6]

Alongside this new growth, an emerging challenge is facing the country–the U.S. electric grid is not prepared for this significant load growth.[7] Moreover, after two decades of stagnant load growth forecasts, grid planners are being caught off guard by the near doubling of the five-year load growth

[3] John Coykendall et al., "Taking Charge: Manufacturers Support Growth With Active Workforce Strategies," *Deloitte Insights*, April 3, 2024, https://www2.deloitte.com/us/en/insights/industry/manufacturing/supporting-us-manufacturing-growth-amid-workforce-challenges.html
[4] Wilson, John D., and Zach Zimmerman, "The Era of Flat Power Demand is Over," *Grid Strategies*, December 2023, p.3, https://gridstrategiesllc.com/wp-content/uploads/2023/12/National-Load-Growth-Report-2023.pdf
[5] PwC, *Economic, Environmental, and Social Impacts of Data Centers in the United States,* September 2023, p.5, https://static1.squarespace.com/static/63a4849eab1c756a1d3e97b1/t/65037be19e1dbf4493d54c6e/1694727143662/DCC-PwC+Impact+Study.pdf
[6] Wilson, John D., and Zach Zimmerman, *supra* note 4, p.3
[7] Wilson, John D., and Zach Zimmerman, *supra* note 4, p.3

forecast.[8] Infrastructure planning required little attention when the U.S. had no growth. However, that is no longer the case.

Reliable and affordable electricity is vital to drive the economic engine of AI and the U.S.' growing digital economy. However, electric power regulation has become an obstacle rather than an enabler of efficient and reliable operation of the grid and its necessary modernization. There must be a faster and more coherent way of addressing permitting and multi-state infrastructure development to enable this economic engine to grow and compete with our rivals, particularly China.

While we debate whether red states or blue states should pay for energy and transmission infrastructure, China is rapidly building transmission and developing its own AI capabilities. "Twenty years ago, Chinese energy consumption was a fraction of U.S. levels and not much higher than Germany. Today, China's primary energy and power consumption are larger than the U.S. and Germany combined."[9] For example, in 2022, China spent over $165 billion on its electricity grids; that same year, the U.S. spent just under $33 billion.[10]

To meet this moment, we need *all* stakeholders to be at the planning table with a much higher degree of transparency, and a new paradigm of collaboration.

Electricity Customer Alliance – Elevating and Connecting the Voice of Electric Customers

ECA is a coalition of commercial, industrial, and residential energy consumers that seek to elevate customers' voices to deliver policy solutions that improve our nation's electricity systems to support and grow the U.S. economy.

As part of its broader mission, ECA aligns diverse electricity customers, retail consumer advocates, trade associations, and public interest groups who want to increase transparency and accountability, specifically to ensure that customers are able to better participate and adapt to meet the needs of a changing electric grid.

As companies that underpin the U.S. digital economy, further critical infrastructure, and spur economic growth, ECA members also support the transition to a clean energy grid.[11] However, technologies not

[8] Wilson, John D., and Zach Zimmerman, "Addendum: The Era of Flat Power Demand is Over," *Grid Strategies*, December 2023, https://gridstrategiesllc.com/wp-content/uploads/2023/12/National-Load-Growth-Report-2023-Addendum.pdf

[9] Cembalest, Michael, Electravision, March 2024, p.16, https://assets.jpmprivatebank.com/content/dam/jpm-pb-aem/global/en/documents/eotm/electravision.pdf

[10] Nick Ferris, "Weekly data: grid investment in China more than every other country combined," *Energy Monitor*, March 15, 2024, https://www.energymonitor.ai/tech/networks-grids/weekly-data-grid-investment-in-china-more-than-every-other-country-combined/

[11] "Our Principles," Electricity Customer Alliance, https://www.electricitycustomers.com/principles-1

yet available at-scale today will be required to reliably and affordably operate a 100% clean energy grid. ECA serves as a venue to develop customer-centric policies to support the reliable operation of the grid until those technologies can be deployed and scaled.

We cannot achieve this goal alone; federal, state, and local governments as well as utility partners, play a key role in promoting a vibrant, modern competitive market for power generation and advanced energy services. We welcome the opportunity to work with Congress, states, and local governments to develop policy solutions that modernize the grid, which will enhance reliability, bolster domestic manufacturing resurgence, grow the economy, and lower electricity costs for energy customers.

America's Digital Economy – Powering the Next Generation of American Ingenuity

At the core of AI's functionality and advancement lies the infrastructure provided by data centers. Data centers are fundamental to our daily lives, powering an array of essential services. They are the backbone of digital infrastructure and the engine of our economy.

Data centers are facilities used to house and manage computer systems and associated components, such as telecommunications and storage systems. They provide a secure, temperature-controlled, and power-managed environment for critical computing infrastructure, such as servers, routers, switches, and storage devices. Data centers are designed to support the reliable and secure operation of information technology (IT) equipment and applications. They typically have redundant power and cooling systems, backup generators, and advanced security measures to protect the equipment and data stored within them.[12] All the "online" data we access on our devices is stored and processed on a vast network of physical servers housed in physical data centers. *See* Appendix A for a more fulsome list of the different data center types and purposes.

- **Enterprise Data Centers**: These data centers are built and operated by individual companies for their internal use. They are typically located on the company's premises and managed by their in-house IT staff. Enterprise data centers cater to the specific needs of the organization, providing customized solutions and control over data and applications.
- **Colocation Data Centers**: Colocation facilities, also known as "colo" data centers, are third-party facilities that rent space, power, and cooling to multiple customers. Companies can place their own servers and networking equipment within these shared spaces. Colocation centers offer solutions for businesses that require data center services but do not want to invest in building and maintaining their own facilities.
- **Cloud Data Centers**: Cloud data centers are operated by cloud service providers like Microsoft Azure, Google Cloud, and Amazon Web Services. These centers provide scalable

[12] Digital Climate Alliance, *Sustainable Data Centers: Powering the Digital Revolution*, March 2023, p.3 https://static1.squarespace.com/static/5e544feb1567935b2bf69451/t/64beb7de601daa6ea5cca7a4/1690220513979/DCA+Data+Center+White+Paper+2023.pdf

and flexible resources over the internet, allowing businesses to access computing power, storage, and applications on-demand. Cloud data centers are known for their high availability, redundancy, and global reach.

Data centers facilitate secure financial transactions, allowing individuals to manage their finances from anywhere, at any time. In the healthcare sector, they support telehealth services that provide remote consultations, improving access to medical care, particularly in underserved or rural areas. Additionally, data centers underpin the operations of vital public services including emergency response systems, government services, and education platforms, ensuring they remain reliable and responsive.[13] In essence, data centers are not just technical facilities; they are pivotal in maintaining the fabric of our digital economy and societal well-being, making them indispensable to the everyday lives of Americans.

Data centers are also the backbone that support the vast computational requirements, data storage, and real-time processing capabilities essential for AI operations. However, AI data centers are fundamentally different than traditional data centers. That is because AI technologies, particularly Machine Learning and deep learning algorithms, require significantly more computational power to train models, analyze vast datasets, and deploy real-time applications than most routine business and personal applications used prior. More computational power requires both more energy for computing and more energy for cooling. The good news is that just over the few years that AI computing has taken off, chip manufacturers and server manufacturers have already begun developing the next generation of more efficient AI systems.

To underscore the scale of the challenge, according to the International Energy Agency's January 2024 report, *Electricity 2024: Analysis and Forecast to 2026*, "data centres, cryptocurrencies, and AI consumed about 460 terrawatt hours (TWh) of electricity worldwide in 2022, almost 2% of total global electricity demand."[14]

On the flip side, as the capabilities of AI applications are rapidly progressing, there is an opportunity for AI to make meaningful contributions to the energy sector.[15] For example, AI can improve power

[13] Digital Climate Alliance, *supra* note 12, p.3
[14] International Energy Agency, *Electricity 2024: Analysis and Forecast to 2026*, January 2024, p.31, https://iea.blob.core.windows.net/assets/ddd078a8-422b-44a9-a668-52355f24133b/Electricity2024-Analysisandforecastto2026.pdf
[15] *See*, U.S. Department of Energy, AI for Energy: Opportunities for a Modern Grid and Clean Energy Economy, April 2024, https://www.energy.gov/sites/default/files/2024-04/AI%20EO%20Report%20Section%205.2g%28i%29_043024.pdf; *see also*, Amane Dannouni et al., Accelerating Climate Action with AI, November 2023, https://web-assets.bcg.com/72/cf/b609ac3d4ac6829bae6fa88b8329/bcg-accelerating-climate-action-with-ai-nov-2023-rev.pdf

generation, grid operation, demand management, and the use of distributed resources.[16] With respect to renewable power generation, AI can help with siting and sizing large solar and wind projects, maximizing production, and predicting and scheduling maintenance to minimize failures. AI can also improve predictions of supply and demand.[17] For example, while wind power can be forecast using weather models, deviations in wind flow can lead to output levels that are not as anticipated. To address this issue, Google and its AI subsidiary DeepMind developed a neural network to increase the accuracy of forecasts for its renewable fleet. Using historical data, they developed a model to predict future output up to 36 hours in advance with much greater accuracy than was previously possible.[18]

AI can also play a vital role in grid operation and optimization by helping network operators understand grid conditions in real time, make more informed decisions, and forecast potential grid disruptions.[19] As more digitized distributed energy resources are added to the grid, AI will play an important role in managing energy demand and distributed resources to better integrate clean energy and enhance grid reliability.[20]

Challenges Facing the U.S.' Aging Electricity Infrastructure – Stymying Large Electric Customers (and the Nation's Economic Drivers)

The adequacy of infrastructure to meet load growth from AI must be put in the broader context of resurgent load growth. Demand growth is resulting from a variety of factors, including not just the expansion of data centers to support AI operations, but also the resurgence and reshoring of manufacturing and the electrification of transportation and buildings.[21] As such, AI appears to be a minority of total load growth, yet it shares the fate of all load growth drivers. That is, policies affecting electricity infrastructure are woefully inadequate to handle new growth reliably and cost-effectively.

Without reform, such policies will suppress economic development, thereby risking the U.S.' global competitiveness. This places strong emphasis on the need for active participation from customers and new load. Policymakers should prioritize the perspectives of those leading the economic development resurgence and who incur the consequences of reliability risks and rising costs: electricity customers.

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[16] Vida Rozite, Vida, Jack Miller, Sungjin Oh, "Why AI and Energy Are the New Power Couple – Analysis," *International Energy Agency*, November 2, 2023, https://www.iea.org/commentaries/why-ai-and-energy-are-the-new-power-couple

[17] Digital Climate Alliance, *Promise and Peril: Sustainability & the Rise of Artificial Intelligence,* June 2024 (forthcoming)

[18] Vida Rozite, Vida, Jack Miller, Sungjin Oh, *supra* note 16

[19] June Kim, "Four ways AI is making the power grid faster and more resilient," *MIT Technology Review*, November 22, 2023, https://www.technologyreview.com/2023/11/22/1083792/ai-power-grid-improvement/

[20] Digital Climate Alliance, *supra* note 17

[21] EFI Foundation, Managing Unprecedented Electricity Demand on the Path of Net-Zero Emissions, April 8, 2024, p.4, https://efifoundation.org/wp-content/uploads/sites/3/2024/04/Load-growth-April-9-2024.pdf

Supply Side Challenges

The bulk power system requires adequate generation and transmission to stay reliable. Some policy barriers to bulk system supply cut across generation and transmission. The foremost issue is permitting and siting. We commend Congress and the Federal Energy Regulatory Commission (FERC) for making progress on improving permitting and siting for generation, transmission, and other infrastructure.[22] But the most challenging issues remain unresolved,[23] such as the need for more efficient judicial review and productive community engagement to expedite infrastructure development in a manner that improves environmental quality. State permitting and siting laws may constitute the largest *long-term* supply-side barrier to a reliable energy future as they increasingly obfuscate market signals that reflect reliability conditions.[24]

Generation Challenges

The greatest *short-term* threat to a reliable and cost-effective system is the underperformance of existing infrastructure. According to reliability authorities, poor performance of the existing generation fleet repeatedly tops the list of reliability problems in recent years,[25] particularly, inadequate weatherization and fuel supply to power plants.[26]

Generation capacity shortfalls may also be upon us before long. The causes are multifaceted barriers to market entry. The problem fully within the power industry's control to fix is backlogged generator interconnection processes. About 2,000 gigawatts (GWs) of power seek interconnection today, which far exceeds the capacity of the existing power fleet, which is approximately 1,250 GWs.[27] Despite FERC Order 2023, which only addresses peripheral problems on interconnection, the core problems

[22] Devin Hartman, "Post-Debt Deal Energy Reforms," *R Street Institute,* June 29, 2023, https://www.rstreet.org/commentary/post-debt-deal-energy-reforms/
[23] Devin Hartman, "Low-Energy Fridays: How Congress Can Liberate Electric Generation," *R Street Institute,* January 5, 2024, https://www.rstreet.org/commentary/low-energy-fridays-how-congress-can-liberate-electric-generation/
[24] Devin Hartman, "Teeing up Congressional Grid Reliability," *R Street Institute,* September 25, 2024, https://www.rstreet.org/commentary/teeing-up-congressional-grid-reliability/
[25] NERC, *2023 State of Reliability Technical Assessment*, June 2023, https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2023_Technical_Assessment.pdf
[26] FERC, *Winter Storm Elliott Report: Inquiry into Bulk-Power System Operations During December 2022,* November 7, 2023, https://www.ferc.gov/media/winter-storm-elliott-report-inquiry-bulk-power-system-operations-during-december-2022
[27] Joseph Rand, "Queued Up: Status and Drivers of Generator Interconnection Backlogs," Lawrence Berkeley National Laboratory, June 2023, https://www.energy.gov/sites/default/files/2023-07/Rand_Queued%20Up_2022_Tx%26Ix_Summit_061223.pdf

causing backlogs remain unresolved.[28] Fixes are readily identified, and one vehicle to do so is passing the *Expediting Generator Interconnection Procedures Act of 2024*,[29] which ECA supports as part of a coalition with customer groups, energy developers, and the R Street Institute.[30]

Transmission Challenges

According to customers, perhaps the most obvious transmission reform in dire need is to enhance the efficiency of the existing transmission system.[31] Advanced transmission technologies like reconductoring or grid-enhancing technologies have massive potential to cost effectively reduce transmission congestion.[32] But these technologies are often underutilized by utilities, whose financial incentive is to overspend on capital-intensive transmission projects and suppress the most efficient projects. ECA previously flagged the need for improvements to congestion transparency outside regional transmission organizations paired with proper cost-of-service regulation,[33] such as FERC Order 881,[34] to ensure utilities use the best cost-effective technologies.

Virtually all transmission is paid for directly by customers, who are concerned by rising costs caused by a regulatory system that rewards inefficient development and suppresses efficient development. The dominance of inefficient, utility-led development increased transmission spending from $9 billion to $40 billion last decade.[35] For example, over 90% of transmission investment was made in the

[28] Garza, Beth and Devin Hartman, "Finishing Generator Interconnection Reform," *R Street Institute,* December 5, 2023, https://www.rstreet.org/commentary/finishing-generator-interconnection-reform/
[29] "Expediting Generator Interconnection Procedures Act of 2024," *H.R. 8085 – 118th Congress*, April 19, 2024, https://www.congress.gov/118/bills/hr8085/BILLS-118hr8085ih.pdf
[30] Ethan Howland, "Democratic bill mandates FERC interconnection reforms to bring new resources online faster," *Utility Dive*, April 18, 2024, https://www.utilitydive.com/news/congress-bill-ferc-generator-interconnection-reform-cortez-masto-castor/713636/
[31] Hartman, Devin and Jennifer Chen, "Transmission Reform Strategy from a Customer Perspective: Optimizing Net Benefits and Procedural Vehicles," *R Street Institute,* May 11, 2022 https://www.rstreet.org/research/transmission-reform-strategy-from-a-customer-perspective-optimizing-net-benefits-and-procedural-vehicles/
[32] Hartman, Devin and Jennifer Chen, *supra* note 31; "Fact Sheet: Biden-Harris Administration Launches Federal-State Initiative to Bolster America's Power Grid," The White House Briefing Room, May 28, 2024, https://www.whitehouse.gov/briefing-room/statements-releases/2024/05/28/fact-sheet-biden-harris-administration-launches-federal-state-initiative-to-bolster-americas-power-grid/
[33] Hartman, Devin and Jennifer Chen, *supra* note 31
[34] FERC, *FERC Rule to Improve Transmission Line Ratings Will Help Lower Transmission Costs*, December 16, 2021, https://www.ferc.gov/news-events/news/ferc-rule-improve-transmission-line-ratings-will-help-lower-transmission-costs
[35] Energy Information Administration, *Utilities continue to increase spending on the electric transmission system,* March 26, 2021, https://www.eia.gov/todayinenergy/detail.php?id=47316#:~:text=Annual%20spending%20by%20major%20U.S

absence of competition and without using economic criteria, such as cost-benefit analysis.[36] Projects that use economic planning criteria and are competitively bid have an impressive track record.[37] The problem is that such projects are the exception, not the rule.

In addition, transmission planning is essential for providing customers with affordable and reliable power. A recent report evaluated four metrics of transmission planning and development performance and found that "all regions must proactively plan for their future needs and provide more information for public review and scrutiny."[38]

Demand Side Challenges

The supply infrastructure requirements of load growth depend on the size, shape, and location of load. Currently, there is a high degree of uncertainty on all three dimensions.[39] Key improvements include the need for more accurate, granular forecasting and innovative market structures.[40] The latter is the only proven way to ensure new power demand responds to price signals in their facility siting and operation decisions and to minimize barriers to self-supply.[41]

This is very important to ensure new load development expands where there is the most infrastructure slack as well as to operate their facilities flexibly and develop self-supply to reduce exacerbating grid emergencies.[42]

[36] Johannes Pfeifenberger, "21st Century Transmission Planning: Benefits Quantification and Cost Allocation," *The Brattle Group,* January, 2022, https://www.brattle.com/wp-content/uploads/2022/01/21st-Century-Transmission-Planning-Benefits-Quantification-and-Cost-Allocation.pdf
[37] Southwest Power Pool, *The Value of Transmission*, January 26, 2024, https://www.spp.org/documents/35297/the%20value%20of%20transmission%20report.pdf
[38] Americans for a Clean Energy Grid, Transmission Planning and Development Regional Report Card, June 2023, p.76, https://gridstrategiesllc.com/wp-content/uploads/2023/06/ACEG_Transmission-Planning-and-Development-Report-Card.pdf
[39] Devin Hartman, "AI, Energy, and Environment," *R Street Institute*, May 17, 2024, https://www.rstreet.org/outreach/ai-energy-and-environment/
[40] Devin Hartman, *supra* note 39
[41] Giberson, Michael and Devin Hartman, "Electric Paradigms: Competitive Structures Benefit Consumers," *R Street Institute*, September 14, 2023, https://www.rstreet.org/research/electric-paradigms-competitive-structures-benefit-consumers/
[42] The Brattle Group, *Brattle Consultants Discuss the Use of Thermal Batteries to Accelerate the Decarbonization of Industrial Heat in a New Report*, October 5, 2023, https://www.brattle.com/insights-events/publications/thermal-batteries-opportunities-to-accelerate-decarbonization-of-industrial-heat/

The Era of Flat Power Demand is Over – Developing Policy Solutions to Enhance Reliability and Power America

Affordable, reliable, and cleaner electricity is vital to drive the economic engine of AI and the U.S.' growing digital economy. However, electric power regulation has become an obstacle rather than an enabler of efficient and reliable operation of the grid and its necessary modernization. There must be a faster and more coherent way of addressing permitting and multi-state infrastructure development to enable this economic engine to grow and compete with our rivals, particularly China.

While we debate whether red states or blue states should pay for energy and transmission infrastructure, China is rapidly building transmission and developing its own AI capabilities. In 2022, China spent over $165 billion on its electricity grids; in 2022, the U.S. spent $32.89 billion on ours. To put that into perspective, China spent more than 5 times what the U.S. spent and more than 4.8 times what the rest of the entire world combined spent on grids.[43]

Policy solutions are not out of reach but will take leadership from this Committee to ensure the benefits from an AI-enabled digital economy are realized. Electricity customers stand ready to work with policy makers, utilities, and other stakeholders to ensure that we can provide the necessary infrastructure to power America into the new economy.

We offer several recommendations below for the Committee's consideration:

Better Align Economic and Electric Infrastructure Development: With new economic development loads looking to connect to the grid, it is important for utilities to have established, transparent policies in place in order to manage and respond to these unforeseen changes in demand. We want to work with states, public utility commissions, and utilities to modernize and align economic readiness with utility load demand growth projections and the "obligation to serve."

Promote Regional Integration and More Interconnected Grids: In a time of growing load demand and increasing reliability challenges due to severe weather and aging infrastructure, more regional and interconnected grids will help support the supply and delivery of power to all areas of the country in an efficient, cost effective, and resilient manner.[44] As such, we want to work with Congress, FERC,

[43] Ferris, *supra* note 10

[44] In the West, states and stakeholders are exploring opportunities to improve regional integration. For example, Nevada and Colorado enacted legislation directing transmission providers to join a wholesale electricity market by 2030. Last December, the Federal Energy Regulatory Commission (FERC) approved a tariff proposal from the California ISO to create an extended day-ahead market. Earlier this year, the Southwestern Power Pool filed a proposal with FERC to expand westward under its Markets+ program, a day-ahead market for utilities to trade resources in advance, which would also help lower costs for the region and provide more reliability as the West continues to experience extreme weather events.

and states to strengthen interregional transmission coordination and planning to identify additional pathways to meet the needs of growing electric loads.

Support Clean Firm Baseload Capacity: Customers are actively developing innovative arrangements and structures.[45] We want to work with utilities on long term needs for clean firm baseload capacity to meet growing demand.

Modernize Grid Governance: In the last two decades, organized wholesale markets have grown considerably and now operate in two-thirds of the country. These markets, while not perfect, are run by various independent, non-profit entities that allow open, non-discriminatory access to the nation's transmission system. We want to work with Congress, FERC and grid operators to modernize grid governance to ensure that customers are better represented, and transmission planning processes are more transparent.

Close Regulatory Gaps on Local Transmission Planning: FERC's new Order 1920 will enhance economic planning criteria for regional projects and likely result in major net benefits for customers. This is beneficial but will not resolve *all* problems at the regional-local nexus, like the need to close regional transmission planning exemptions that allow for overbuilding of local projects without competitive practices or effective cost-of-service oversight. Customers want to work with FERC, states, and regional partners to increase transparency and review of the prudency of such projects.

Promote Customer-Centric Reliability Solutions: We want to work with Congress to advance a customer-centric reliability agenda, which could include:

- Conducting oversight: Refine reliability authorities of federal and state regulators and develop a framework for institutional coordination.
- Liberating supply: Prioritize permitting, including siting, and additional interconnection reform; bolster transmission system efficiencies, technologies, and planning.
- Unleashing customer solutions: Eliminate barriers to self-supply and flexible demand, which slashes rotating outage needs and reduces customer cost.
- Enhancing grid protection: Promote robust, cost-effective cybersecurity measures and support regional grid resilience efforts.

[45] *See*, Duke Energy, *Responding to growing demand, Duke Energy, Amazon, Google, Microsoft and Nucor execute agreements to accelerate clean energy options*, May 29, 2024, https://news.duke-energy.com/releases/responding-to-growing-demand-duke-energy-amazon-google-microsoft-and-nucor-execute-agreements-to-accelerate-clean-energy-options?utm_source=linkedin&utm_medium=social&utm_content=linkedin_duke-energy-corporation_36906_post_13588355213_20240529_spr&utm_campaign=evergreen&utm_term=13588355213

Conclusion – Working Together to Modernize the Grid to Enhance Reliability, Support U.S. Manufacturing Resurgence, and Grow the Economy

The intersection of AI and data centers is a pivotal area that will fundamentally alter the future of technology and innovation. Unfortunately, the development of infrastructure needed to support this digital economy has ground to a halt. This is unacceptable.

For the U.S.' economic and national security, we need AI's technological innovators to continue developing in the U.S.; we need tech and manufacturing giants, many of which are members of ECA, to continue to call the U.S. "home".

Load growth is not bad growth. Now is the time for serious conversations about how to speed up the pace to build electricity infrastructure and systems that will power the digital and new AI economy for years to come.

APPENDIX A

Data Centers 101

What are data centers?

- A data center is a facility used to house and manage computer systems and associated components, such as telecommunications and storage systems. It provides a secure, temperature-controlled, and power-managed environment for critical computing infrastructure, such as servers, routers, switches, and storage devices. Data centers are designed to support the reliable and secure operation of information technology (IT) equipment and applications. They typically have redundant power and cooling systems, backup generators, and advanced security measures to protect the equipment and data stored within them.

Types of data centers?

- Data centers vary widely in terms of size, purpose, and operational models. Below are a few of the more common categories of data centers.

    - ***Enterprise Data Centers:*** These data centers are built and operated by individual companies for their internal use. They are typically located on the company's premises and managed by in-house staff. Enterprise data centers cater to the specific needs of the organization, providing customized solutions and control over data and applications.

    - ***Colocation Data Centers:*** Colocation facilities, also known as "colo" data centers, are third-party facilities that rent space, power, and cooling to multiple customers. Companies can place their own servers and networking equipment within these shared spaces. Colocation centers offer solutions for businesses that require data center services but do not want to invest in building and maintaining their own facilities.

    - ***Cloud Data Centers:*** Cloud data centers are operated by cloud service providers like Microsoft Azure, Google Cloud, and Amazon Web Services. These centers provide scalable and flexible resources over the internet, allowing businesses to access computing power, storage, and applications on-demand. Cloud data centers are known for their high availability, redundancy, and global reach.

    - ***Hyperscale Data Centers:*** Hyperscale data centers are extremely large facilities designed to support massive-scale computing and storage operations. They are typically used by large tech companies such as Google, Amazon, Meta, and Microsoft. These centers feature thousands of servers and are optimized for efficiency and scalability, handling enormous amounts of data and traffic.

- ***Edge Data Centers:*** Edge data centers are smaller facilities located close to the end users they serve. They provide data processing and storage at the "edge" of the network, reducing latency and improving performance for applications that require real-time data processing. Edge data centers are crucial for applications such as Internet of Things (IoT), autonomous vehicles, and other latency-sensitive technologies.

- ***Telecom Data Centers:*** Telecom data centers are owned and operated by telecommunications companies. These centers support telecommunications networks, providing services such as voice, data, and video communication. They often host equipment for switching, routing, and data transmission, playing a key role in the overall telecommunications infrastructure.

- ***Micro Data Centers:*** Micro data centers are compact, self-contained units that provide localized computing resources. They are designed for rapid deployment and can be installed in various environments, including remote or constrained locations. Micro data centers are often used for specific applications, such as retail environments, branch offices, or temporary installations.