Before the
National Telecommunications and Information Administration
Washington, D.C. 20230

In the Matter of	)	
	)	
Request for Comment on Bolstering Data Center Resilience and Security	)	Docket No. 240823–0225
	)	
	)	

COMMENTS OF INCOMPAS

INCOMPAS submits these comments in response to the National Telecommunications and Information Administration (NTIA) *Request for Comment* on the challenges surrounding data center growth, resilience, and security in the United States.[1] INCOMPAS, the national industry association for providers of internet and competitive communications networks, represents a variety of different entities across the data center environment. INCOMPAS is in a unique position of representing members who build out broadband and digital infrastructure to service data centers, companies that offer cloud communications services, and companies that operate data centers of all categories. Other members include technology companies, both large and small, that are industry leaders in the development and integration of artificial intelligence technologies and products, which is driving the need for stronger, more efficient infrastructure and larger data center capacity.

[1] *Request for Comments on Bolstering Data Center Growth, Resilience, and Security*, National Telecommunications and Information Administration, Docket No. 240823–0225 (rel. Sept. 4, 2024) ("*Request*").

Introduction

A data center is a physical location that stores computing machines and their related hardware equipment.[2] It is the physical facility that stores any company's digital data by using servers, data storage drives, and network equipment. There are several different types of data centers. Enterprise data centers are fully company-owned and used to process internal data.[3] Colocation data centers is a type of data center where companies can rent equipment, space, and bandwidth from the data center's owner. Edge data centers are small and are located near the edge of a network, closer to end users and devices.[4] Finally, the most pressing type of data center in conversation today is a hyperscale. Hyperscale data centers are massive, with at least 5,000 servers and up to millions of square feet of space.[5] These data centers are big not only because of the amounts of data they must store, but also because their goal is redundancy, which is imperative for services that operate continuously. Hyperscale data centers provide many backup measures that offer security and certainty when equipment may fail, or power is lost.[6] Hyperscale data centers are often owned and operated by the same technology company. As of Q3 of 2023, Amazon, Microsoft, and Google accounted for 60% of all hyperscale data center capacity. [7]

Companies rate data centers by tiers 1 - 4 to highlight their expected uptime and reliability.[8] A Tier 1 data center has a single path for power and cooling and few, if any,

---

[2] *What is a Data Center?,* AWS*, available at* https://aws.amazon.com/what-is/data-center/
[3] *What is a Data Center? Tiers, Types, and More,* Nltye Software, *available at* https://www.nlyte.com/faqs/what-is-a-data-center/
[4] *Id.*
[5] Phill Powell & Ian Smalley, *What is a Hyperscale Data Center?,* IBM*, available at* https://www.ibm.com/topics/hyperscale-data center#:~:text=A%20hyperscale%20data%20center%20differs,and%20with%20little%20direct%20supervision.
[6] *Id.*
[7] *Hyperscale Data Centers Hit the Thousand Mark; Total Capacity is Doubling Every Four Years*, Synergy Research Group (rel. April 17, 2024), *available at* https://www.srgresearch.com/articles/hyperscale-data-centers-hit-the-thousand-mark-total-capacity-is-doubling-every-four-years
[8] *Id.* at fn. 3.

redundant and backup components, an expected uptime of 99.671%, and 28.8 hours of downtime annually. A Tier 2 data center has a single path for power and cooling, some redundant and backup components, expected uptime of 99.741%, and 22 hours of downtime annually. A Tier 3 data center has multiple paths for power and cooling systems in place to update and maintain it without taking it offline, an expected uptime of 99.982%, and 1.6 hours of downtime annually. Finally, a Tier 4 data center is built to be completely fault-tolerant, has redundancy for every component, an expected uptime of 99.995%, and 26.3 minutes of downtime annually.

As mentioned in the *Request*, the development of artificial intelligence will drive an increase for data center storage capacity. Data volumes required for AI applications are enormous and continue to grow. AI is projected to increase data center storage capacity from 10.1 zettabytes (ZB) in 2023 to 21.0 ZB in 2027.[9] In order to ensure connectivity of all applications and services, an integrated, wholistic approach to digital infrastructure must be prioritized. Every step of digital infrastructure must work together, from the practical issues that arise when physically building a data center, delivering power to the data center, and delivering services to consumers and businesses through robust broadband connections. Below INCOMPAS offers its responses to NTIA's specific questions.

Questions Presented

Question 1. What current and future challenges and opportunities do commercially owned or operated data centers in the United States face in supplying computing power required by critical and emerging technologies, such as AI?

[9] *AI Growth Creates Unprecedented Demand For Global Data Centers*, Fierce Network (rel. Jan. 31, 2024), *available at* https://www.fierce-network.com/newswire/ai-growth-creates-unprecedented-demand-global-data-centers.

Answer 1. The growth in data centers to support innovative technologies like AI is occurring at the same time as the reshoring of manufacturing in the U.S. on top of transportation and building electrification to meet decarbonization targets. Combined, this is increasing the pressures on the electrical grid. To ensure data center development continues to occur in the U.S., the electrical grid must be modernized to support this economic growth and ensure: 1) timely access to reliable energy for large customers, 2) utilities and grid operators move fast to build new carbon free generation, new transmission and modernize existing transmissions through GETS technologies, and 3) utilities have the programs available for large customers to support their operations with new renewables and carbon-free electricity.

Question 2. What are critical market considerations for the data center industry seeking to modernize or expand their footprint?

Answer 2. When choosing whether to build a data center or to purchase data center space, several factors are taken into consideration. Initially, the amount of capital a company wants to invest determines whether renting or building is the best option. Renting from a colocation data center requires a smaller initial investment. However, building a data center allows an organization to build to their ideal specifications.[10]

If an organization decides to build, the policy environment at the state level is a key consideration on whether it is economically and operationally efficient to build data centers in certain locations. Sales and use tax exemptions and property tax incentives are offered by 25+ states on data center equipment, which are critical to the U.S. competing globally on cost. Now, some state legislatures want to discourage data center investment by either revoking their

[10] *Id.* at fn. 5.

programs or not creating new data center tax programs. This creates a chilling effect for new investment. The U.S. Government can help improve this political environment by: 1) encouraging states and electric utilities to want to attract data center investment, 2) helping change the growing negative rhetoric towards data centers by policymakers and the media, and 3) encouraging states like Illinois with open-ended and unclear biometric laws, to consider the risk impacts of such laws on new AI data centers.

Other key factors include: 1) proximity to major markets and customers, 2) amount of local and state economic development incentives, labor costs and availability, 3) environmental conditions, 4) availability and cost of real estate options, 5) availability of telecommunications infrastructure, and cost of utilities,[11] 6) ability to develop redundant fiber paths and support right-of-way access for further development if needed, 7) access to support new renewable and carbon free energy to continue progress towards sustainability goals, 8) proximity to technical engineering talent and local universities, 9) clear and efficient local and state approval processes necessary for development, construction, and operations, 10) business friendly climate and strong partnerships, and 11) robust international connectivity via submarine fiber optic cables.

Question 2(c). What key regulatory barriers exist at the federal, state, local, tribal, and territorial level?

Answer 2(c). – Many regulatory barriers create unnecessary burdens on several areas of deploying digital infrastructure, including utilities, which impacts data center efficiency. As data center demand increases, so does energy demand. AI is estimated to increase data center power

[11] *Id.* at fn. 8.

demand by 160% by 2030.[12] Existing electrical infrastructure in some areas can handle this amount of demand, but many cannot and will need to be modernized. Local and state permitting procedures should encourage these modernizations.

The need for high-speed connectivity in data centers has led to significant investments by member companies in infrastructure such as fiber optics and cloud services, enhancing overall network quality and reliability. INCOMPAS' members consistently face delays in permitting and gaining access to the public rights-of-way when deploying broadband.[13] These same issues will occur when modernizing the electric grid. INCOMPAS supports increasing access to public rights-of-way, accelerating approval of permits, and asking state and local governments, utilities, and railroads to charge fees that are based only on their actual, objectively reasonable costs. These improvements would help streamline improvements of all necessary infrastructure.

The policy environment at the state level is a key consideration on whether it is economically and operationally efficient to build data centers in certain locations. Sales and use tax exemptions and property tax incentives are offered by 25+ states on data center equipment, which are critical to the U.S. competing globally on cost. Now, some state legislatures want to discourage data center investment by either revoking their programs or not creating new data center tax programs. This creates a chilling effect for new investment. The U.S. Government can help improve this political environment by: 1) encouraging states and electric utilities to want to attract data center investment, 2) helping change the growing negative rhetoric towards data centers by policymakers and the media, and 3) encouraging states like Illinois with open-ended

[12] *AI is Poised to Drive 160% Increase in Data Center Power Demand*, Goldman Sachs (rel. May 14, 2024), *available at* https://www.goldmansachs.com/insights/articles/AI-poised-to-drive-160-increase-in-power-demand.
[13] *See., e.g.*, Letter from Thomas Jones, Counsel for Zayo Group, LLC, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-79 & WC Docket No. 17-84 (fil. Oct. 31, 2019) ("[M]any local and state governments condition [its] access to public rights of way for the purpose of deploying wireline facilities on the payment of above-cost and discriminatory access fees as well as on compliance with ambiguous in-kind contribution requirements.").

and unclear biometric laws, to consider the risk impacts of such laws on siting new AI data centers.

On the federal level, the Team Telecom Review Process (at the Departments of Justice and Homeland Security, Defense, and State Departments, and the Federal Communications Commission) has become complex, subject to delays, and has a lack of transparency for applicants about why decisions are made and what risks the government is trying to avoid. This review process is required for subsea cable landings in the U.S., which are critical to support domestic data center development. The process as it stands today discourages subsea cable investments in the U.S. at a time where more investment is needed quickly to ensure sufficient network resilience and capacity to support data centers. Likewise, competing uses of maritime space is making it increasingly difficult to create diverse and resilient landings for subsea cables in the United States. Providing relief to NOAA's permitting requirements for subsea cables entering marine sanctuaries could open new landing sites.

Question 3. As demand for computing power and data processing increases, what are the potential societal impacts (e.g., communities, environment, customers)—both positive and negative—of data center modernization or investment?

Answer 3. – As previously mentioned, energy demand will increase exponentially in the next five years. The growing demand for power across many industries and sectors is something large energy users and utilities are grappling with, not just the data center industry. As data center sites are assessed, data center companies engage with local utilities and energy providers early and often. This includes supporting upgrades to utility infrastructure or building new substations when necessary to support the new data center.

Question 3(c). How might data centers' modernization or investment affect disadvantaged communities or groups, including rural communities, in their sites of operation?

Answer 3(c). – Data centers have a significant positive impact on the local communities where they are located, bringing jobs, investment, tax dollars, and philanthropy. They provide employment opportunities for local residents and stimulate economic growth. The opportunities for construction jobs include hiring local, skilled trades labor, while operational jobs, many of which do not require a 4-year degree, include a diversity of positions, such as technicians, heating and cooling specialists, engineers, project managers, site managers and more. Many data centers also offer on the job training.

The investment in data centers also brings significant tax dollars to the community, funding important public services including local public schools and infrastructure projects. Lastly, data centers require robust local infrastructure such as the expansion and upgrades of local roads, power infrastructure, network speeds, and water systems. This benefits local residents and drives even more economic development for communities.

Question 4(a). What supply chain interdependencies are critical to ensuring availability of the critical IT/OT components within data centers? What IT/OT equipment supply chain shortages, if any, might hinder the development of data centers in the U.S.?

Answer 4(a). Shortages are dependent upon general industry demand. There is a demand spike across all data center operators, including hyperscalers. This could lead to timeline impacts, delaying data centers operations.

Question 6. Are there workforce challenges inhibiting growth in the data center industry? Is the data center industry experiencing a shortage of network engineers, cybersecurity professionals, construction workers, or any other types of professionals?

Answer 6. – There is a growing labor shortage of electricians, who are critical to building and operating data centers and energy infrastructure. There is an opportunity to spur workforce development programs for electricians through Community Colleges and apprenticeship program grants.

Question 7. What challenges do data centers face in accessing power for their facilities? What novel solutions are data center operators exploring or implementing to ensure access to power?

Answer 7. Data centers are critical infrastructure and must operate 24-hours a day, 7-days a week. In the event power is lost from the utility, most data centers are equipped with a backup generator system, designed for each data center site to meet its specific needs and local conditions.

Question 7(c). What initiatives are data centers exploring (e.g., net zero efforts) to mitigate greenhouse gas emissions from energy use? Are data centers facing obstacles in these efforts?

Answer 7(c). Corporate investments in clean and renewable energy have been vital for renewable energy project financing. Last year, they accounted for almost 40% of all new energy added to the grid globally.[14] Technology companies are consistently within the top ten corporate

[14] Caroline Zhu, *Global Corporate Clean Energy Procurement Maintains Momentum in 2024*, S&P Global (rel. June 28, 2024), *available at* https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/062824-global-corporate-clean-energy-procurement-maintains-momentum-in-2024.

renewable energy buyers globally according to Bloomberg.[15] Corporations in 2023, including the leading hyperscale data center operators, increased their solar and wind contracts by 12%.[16] Member corporations, like Meta, are prioritizing decarbonization and renewable energy in order to achieve a path to net zero.[17] Specific initiatives within data center operations to limit carbon emissions include designing hardware that is efficient, easy to repair, and can be reused. It is important that data center technicians be able to quickly and safely identify and repair issues, which extends the lifespan of hardware. At the end of the hardware's life, after data has securely been destroyed, residual materials can be recycled or responsibly reused in other technologies.

To further develop their net zero efforts, INCOMPAS members have started utilizing other options of clean energy, like geothermal and nuclear. This pathway of clean energy has already been supported by the Department of Energy in their "*Recommendations on Powering Artificial Intelligence and Data Center Infrastructure*."[18] Harnessing these types of clean energy will advance a new era of reliable, sustainable baseload power and enhance grid stability.[19]

INCOMPAS member technology companies utilize the widely respected emissions accounting protocol called the Greenhouse Gas Protocol (GHGP) to calculate Scope 1, Scope 2 and Scope 3 greenhouse gas emissions. The use of this protocol has recently been under media

---

[15]Oktavia Catsaros, *Corporate Clean Power Buying Grew 12% to New Record in 2023,* Bloomberg NEF (rel. February 13, 2024), *available at* https://about.bnef.com/blog/corporate-clean-power-buying-grew-12-to-new-record-in-2023-according-to-bloombergnef/.

[16] *Id.*

[17] *Our Path to Net Zero*, Meta (rel. July 2023), *available at* https://sustainability.fb.com/wp-content/uploads/2023/07/Meta-2023-Path-to-Net-Zero.pdf.

[18] *See* "Recommendations on Powering Artificial Intelligence and Data Center Infrastructure", U.S. Dept. of Energy, Secretary of Energy Advisory Board (July 30, 2024) ("the Secretary should accelerate private investment in emerging technologies by supporting legislation that de-risks private investment in new technologies and by providing technical support to data center owners interested in making long-term financial commitments to next-of-a-kind technologies in nuclear, geothermal, long-duration energy storage, and CCS that are aligned with DOE liftoff reports.")

[19] See "PRESS RELEASE: Sage Geosystems and Meta Announce Agreement for Next-Generation Geothermal Power Generation"; "The Sage and Meta partnership builds on the momentum that geothermal energy is a viable renewable energy source across the U.S and Sage will utilize its proprietary Geopressured Geothermal System (GGS) to provide carbon-free power to Meta's data centers."

scrutiny, especially the use of the Scope 2 methodologies called location-based emissions and market-based emissions that account for the emissions associated with data center electricity use. The market-based emissions metric in the GHGP was developed to incentivize voluntary corporate investment in clean and renewable energy. Voluntary investment does not happen without a mechanism to claim it. The GHGP is being updated for the first time in a decade. The grid, technologies, and climate issues have changed dramatically in ten years and the GHGP should reflect the variety of ways that companies can make critical investments to support global sustainability.

Question 7(d). What are the most effective innovations in data center cooling / reduction in power usage effectiveness (e.g., networking innovations, silicon photonics)?

Answer 7(d). Liquid cooling is a newer technology that allows servers and computer chips to be cooled directly by liquid (not water), rather than being cooled only by air, through a connected cooling system that includes liquid cooling systems and fans. However, the best cooling approach for a data center depends on the IT load and local factors like climate, water availability (including recycled and non-potable water sources), and reliability and available capacity on the electrical grid. In many places, water may be the most efficient means of cooling as there is a trade-off between energy use and water use with data center cooling. When used responsibly, water cooling can play an important role in reducing data center energy use and the associated greenhouse gas emissions.

Question 7(e). Can data center backup power generation be used to participate in utility demand response programs?

Answer 7(e). Power generation technology (including diesel and natural gas reciprocating engines) emissions and usage are tightly regulated federally by the EPA, as well as by state and local environmental agencies. Many of today's data center backup power generation sources are Tier 2 diesel-fueled standby generators designed and permitted for emergency use only. Federal regulations prohibit the use of emergency sources for demand response purposes except under very narrow and limited use cases (i.e. up to 50 hours per year per source, provided that several prerequisite conditions are met; some states and localities do not adopt these federal provisions). A Tier 4 certified generator permitted as a nonemergency emission source can be used in a demand response program provided that the local authorities having jurisdiction approves the project.

Question 7(f). – Are there opportunities for new tariff structures to help connect large loads to the grid while mitigating the risk of cost shifts to other electricity customers?

Answer 7(f). As data center sites are assessed, data center companies engage with local utilities and energy providers early and often. This includes supporting upgrades to utility infrastructure or building new substations when necessary to support the new data center. Data center operators often create new tariffs - typically known as green tariffs[20] - in partnership with utilities. Green tariffs allow utilities to bring on new clean and renewable resources to support data center (or any other large customer) operations and sustainability goals. The cost of those resources are solely borne by the data center customer.

[20] *What is a Green Tariff?,* CEBA, *available at* https://cebuyers.org/solutions/procure-clean-energy/green-tariffs/.

Question 8. What voluntary guidelines, domestic regulations, or frameworks are currently in place or should be implemented to help manage data security risks in data centers while also maximizing the benefits of secure data processing and storage?

Answer 8. INCOMPAS members have implement a "zero trust" mentality, with multiple layers of security (physical and cyber), strict protocols, and checks and balances that every person handling data or hardware must comply with. Data storage devices have a strict chain of custody and are destroyed onsite at their end of life. All data coming in and out of the data center is encrypted, which is consistent with NIST standards. Remote access to data is subject to multiple layers of cyber security controls, including role-based access (no one gets access by default), two factor authentication, internal approvals, and processes to depreciate access for people who change roles or projects or leave the company.

Thank you for considering our comments as you examine data center growth, resilience, and security.

Respectfully submitted,

/s/ Taylor Abshire
Taylor Abshire
Policy Advisor
INCOMPAS
1100 G Street, NW
Suite 800
Washington, DC 20005
(202) 296-6650

November 4, 2024