

Chart of the Week #2024-45

U.S. Data Centers: A Provisional Summary in Two Tables



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November 13, 2024
Washington, DC



U.S. Data Centers by State				
	Under			
	Operational	Construction	Planned	Total
Virginia	341	43	93	477
Texas	251	14	24	290
California	269	5	11	285
Ohio	125	14	25	164
Illinois	129	6	21	156
New York	128	1	0	129
Florida	118	2	1	121
Oregon	97	7	8	112
Arizona	77	4	14	95
Washington	88	2	1	91
Georgia	72	12	6	90
Pennsylvania	70	1	0	71
New Jersey	68	1	1	70
North Carolina	59	3	2	64
Connecticut	28	3	29	60
Minnesota	44	1	14	59
Rest of U.S.	638	20	18	676
Total U.S.	2,602	139	268	3,010
<i>Analysis Based on DCM and Company Data</i>				<i>EPRINC</i>

Power Requirements of U.S. Data Centers: Under Construction and Planned					
	Under Construction	Projected Power Needs (MWs)	Planned	Projected Power Needs (MWs)	Total Projected Power Needs (MWs)
Virginia	43	1,643	93	4,701	6,344
Texas	14	2,324	24	790	3,114
Arizona	4	72	14	2,418	2,490
Georgia	12	1,196	6	300	1,496
Nevada	4	1,075	1	1,200	2,275
Connecticut	3	96	29	640	736
Illinois	6	157	21	1,032	1,189
California	5	89	11	135	224
Colorado	1	177	1	18	195
Minnesota	1	75	14	180	255
Rest of U.S.	46	639	54	313	952
Total U.S.	139	7,543	268	11,727	19,270
<i>Analysis Based on DCM and Company Data</i>					<i>EPRINC</i>

- **In order to better assess data center power demand needs, EPRINC has begun collecting data at the facility level. Current summaries are provisional and will likely be restated upward as more and better information is incorporated.**
- **Virginia, Texas, and California dominate the current installed base with 341, 251, and 269, respectively. Virginia is set to continue this dominance by adding another 136 centers, of which 43 are under construction and another 93 are planned with total projected power needs of 6,344 MWs.**
- **During 2024, data centers and their electricity requirements have become a rising concern for policymakers. Where aggregate U.S. power demand has been flat for twenty years, there appears to be the need to restate load forecasts upward and restart mothballed or add new dispatchable generating capacity driven by the advent of generative AI (artificial intelligence) hosted at data centers.**
- **On November 1, 2024, these concerns crested when on the same day FERC (the U.S. Federal Energy Regulatory Commission) held its Commissioner-Led Technical Conference Regarding Large Loads Co-Located at Generating Facilities (<https://www.youtube.com/watch?v=2Ze-1dLQIRk>), and issued a major decision on power generation servicing data centers. The conference focused on the uncertainty of long-term load forecasting, especially with rising demand; the decision denied Talen Energy's agreement with Amazon (AWS) to divert up to 480 MWs directly to the planned AWS data center. In each case, FERC's stated concern is to “prioritize grid reliability.”**

- **Background:** The number of U.S. data centers is growing to accommodate expanding data needs driven by entertainment (streaming services), telecom (smartphones and tablets), security (doorbell cameras), SCADA (Supervisory Control and Data Acquisition – remote management of industrial processes as well as data-gathering from related devices), and many other requirements for data storage and dissemination.
- Additional data center demand growth is expected to be driven by generative artificial intelligence (AI). Currently, an AI data request consumes 10 times the electricity of a typical Google search request. But the rate of future AI acceptance and usage is uncertain, thereby challenging power generation planning.
- In the U.S., data centers are not distributed equally across the country. Rather, they are located in states with affordable commercial real estate, robust network connectivity, infrequent natural disaster occurrences, and lower-cost electricity. Washington State, Illinois, and Texas are three with high data center concentrations. However, Virginia dominates them all.
- And the largest share of continued expansion of data centers is expected to be in Virginia where there is ample space, affordable electricity, proximity to key high-capacity network transmission lines, and infrequent natural disasters.
- From 2009 to 2019, Virginia's commercial power demand grew at an annual rate of 1.4%; but from 2019 to 2023, Virginia's commercial power needs accelerated to 5.8%, primarily driven by the rapid expansion of data centers (at this rate, commercial power demand will double within 12 years). By comparison, during this same period, Virginia's residential and industrial electricity demand declined by 1.6% and 1%, respectively.

This slide deck is available at: <https://eprinc.org/chart-of-the-week/>

For more information on these charts, please contact Max Pyziur (maxp@eprinc.org).