Instant Insight

Hungry AI

What Data Center Growth Means for Natural Gas Demand by 2030

Zlata Sergeeva

March 2026 | KS--2026-II02

About KAPSARC

KAPSARC is an advisory think tank within global energy economics and sustainability providing advisory services to entities and authorities in the Saudi energy sector to advance Saudi Arabia's energy sector and inform global policies through evidence-based advice and applied research.

This publication is also available in Arabic.

Legal Notice

Key Points

- Artificial intelligence (AI)-driven data center growth adds considerable variability to global energy demand outlooks, and current quantitative assessments of its impact remain preliminary.
- Even under conservative assumptions, data centers could add approximately 47 bcm of global gas demand by 2030, rising to 130-270 bcm in higher gas-use scenarios.
- Natural gas is well suited to meet this demand because of its reliability, relatively rapid deployment, cost competitiveness, and grid constraints facing renewables.
- Impacts will vary by region, favoring countries with abundant gas resources, competitive industrial prices, and existing infrastructure, notably in parts of Asia Pacific.

Keywords: Natural Gas, Artificial Intelligence, Digitalization, Energy Demand

Introduction

01

Leading energy and policy institutions, as well as industry consultancies, identify AI-driven data center electricity demand as a key source of uncertainty in energy demand forecasts. This uncertainty reflects divergent adoption pathways, efficiency gains, and infrastructure constraints (IGU 2026; IEA 2025; U.S. DOE 2024; EPRI 2024; Harder 2025; BNEF 2025).This Instant Insight compiles the most credible recent quantitative estimates to assess the potential implications of this emerging demand for natural gas markets.

Comparing Estimates: Many Views, Few Figures

02

As of January 2026, despite strong interest in data center energy demand, only a limited number of institutions have published quantified forward-looking estimates. Among publicly available sources, the IEA provides the most detailed global analysis, while Goldman Sachs offers percentage-based estimates that are broadly aligned with the IEA's assumptions. Some consultancies, such as McKinsey & Company, publish detailed but country-specific projections.

Table 1 summarizes the main estimates, and Figure 1 presents them graphically.

Table 1. Data center demand estimates by leading institutions, and corresponding gas requirements by 2030 by the author.

Institution (leading author and year)	Extra electricity demand from data centers	Notes	Maximum potential demand for natural gas from data centers by 2030 (billion cubic meters, author's estimates)
International Energy Agency (2025)	Growth from 460 TWh in 2024 to 1,050 TWh in 2030	• The IEA projects that 50% of data center electricity demand in 2030 will be met by renewable energy • The IEA projects that 25% of demand, equivalent to 263 TWh, will be powered by natural gas	• 182 bcm of maximum gas demand if 1,050 TWh is powered exclusively by natural gas (providing 100% of data centers' electricity demand by 2030) • 47 bcm if only 263 TWh is powered by natural gas (providing 25% of expected data center electricity demand by 2030)
Oxford Institute for Energy Studies (Poudineh 2025)	770 TWh (low case) 1,560 TWh (high case) in 2030	-	• 133 bcm (low case, if gas powers 100% of the 770 TWh) • 270 bcm (high case, if gas powers 100% of the 1,560 TWh)
S&P (based on IEA data) (Franke 2025)	945 TWh in 2030	-	• 164 bcm (if gas powers 100% of 945 TWh)
Goldman Sachs (2025)	50% growth by 2027; 165% growth by 2030 compared to 2023 (1,060 TWh demand in 2030)	-	• 184 bcm (if gas powers 100% of 1,060 TWh)
DNV (Harder 2025)	667 TWh for general-purpose data centers and 360 TWh specifically for AI in 2030	-	• 116 bcm (if gas powers 100% of 667 TWh)
BNEF (2025)	1,200 TWh in 2035 and 3,700 TWh in 2050	-	• 208 bcm (if gas powers 100% of 1,200 TWh by 2035) • 641 bcm (if gas powers 100% of 3,700 TWh by 2050)

Note: Gas volumes are calculated assuming 55% efficiency for an average combined-cycle gas turbine (CCGT).

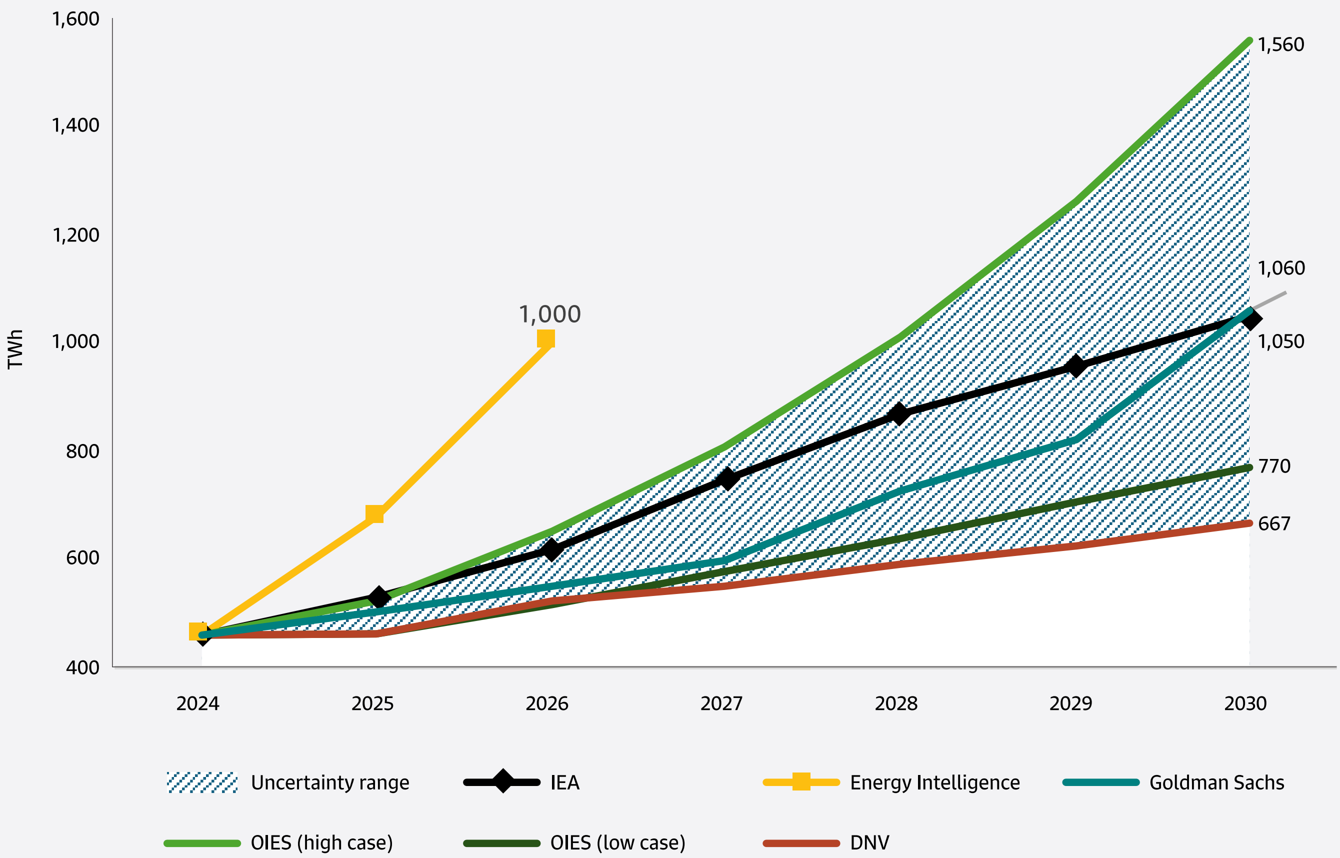
Source: Author, based on IEA (2025), Poudineh (2025), Franke (2025), Goldman Sachs (2025), Harder (2025), and BNEF (2025); for the last column – author's estimates.

The final column of Table 1 presents the Instant Insight author's estimates of the natural gas volumes required to meet projected data center demand. In a low-case scenario, in which gas supplies only 25% of this demand, additional consumption would reach at least 47 bcm, based on IEA projections. Higher reliance on natural gas to power the AI revolution could raise this figure to 130-270 bcm, as discussed in the following section.

Multiple regional estimates are also available, primarily addressing expected data center demand in the United States.

For example, McKinsey & Company projects that U.S. data centers will consume 606 TWh in 2030, nearly as high as DNV's estimate for global demand (Green et al. 2025). The U.S. Department of Energy is more conservative, projecting 325-580 TWh of U.S. data center demand in 2028 (U.S. DOE 2024). In both cases, if 100% of the additional data center electricity demand were met by natural gas, this would imply an additional 56-105 bcm of gas demand from the United States alone.

Figure 1. Leading estimates of global data centers demand by 2030, TWh.



Source: Author, based on IEA (2025), OIES (Poudineh 2025), S&P Global (Franke 2025), Goldman Sachs (2025), and DNV (Harder 2025).

03 Why Natural Gas?

Several factors position natural gas as a competitive option to provide affordable and reliable power to data centers, which are outlined as follows.

- **Reliability**. Data centers require continuous baseload power, which intermittent renewables and still-costly battery storage struggle to provide.

- **Speed**. Data centers can be built in fewer than two years, while new renewable generation projects often take considerably longer. Gas-fired power plants can be deployed relatively quickly. However, recent supply constraints in the gas turbine market are extending project timelines.

- **On-site generation potential**. Long interconnection queues, insufficient power availability, and grid capacity constraints in some countries, such as the United States, encourage on-site gas generation or hybrid microgrids, particularly at small to medium scale, with growing interest in locations near existing LNG infrastructure (IGU 2026). In such configurations, gas-fired generation can be developed directly on site and operated independently, reducing or eliminating the need for immediate connection to the main transmission grid. However, given current supply constraints in the global gas turbine market, the near-term feasibility of large, dedicated gas generation projects is uncertain. As a result, most hyperscale developments are more likely to rely on a combination of grid supply, contracted off-site generation, and limited on-site firming capacity rather than fully standalone gas power plants.

- **Cost**. Gas-fired power remains cost competitive in many regions.

- **Environmental considerations**. Natural gas has a lower carbon footprint than coal, can reduce flaring by encouraging local use,[1] and competes less directly with renewables needed to meet broader decarbonization targets.

In addition, most U.S. data centers still rely on fossil fuels, with natural gas supplying more than 40% of power and coal about 15% (another 25% is provided by renewables, and the remaining 20% by nuclear energy). While coal is likely to be phased out in favor of gas, renewables (or nuclear) may not scale fast enough; therefore, gas might take a much higher share in meeting data center energy demand than the 25% projected by the IEA for 2030 (IEA 2025). Recent news about a new phase of Japan-U.S. cooperation supports this possibility. Within a $550 billion investment package, Japanese companies have agreed to build integrated "data center + power generation" facilities in various parts of the United States, starting with gas-fired projects (Sung 2025; Research by nicoxz 2026).

1 There is evidence that some data centers, especially micro data centers in the United States, are being powered by natural gas that would otherwise be flared, thereby creating environmental benefits for society (MARA 2025).

Potential Implications for the Natural Gas Industry?

04

The scale of the potential impact on the gas market remains highly uncertain. At the lower end, an additional 47 bcm of demand by 2030 would be marginal relative to global consumption of 4,122 bcm in 2024 (IGU 2025). At the upper end, however, 270 bcm of demand from data centers alone would imply a 6.5% increase in global gas demand over six years, equivalent to annual growth of about 1.1%. For comparison, overall global gas demand growth was estimated at 1.7% in 2025, 1.9% in 2024, and 1.5% in 2023 (IGU 2025).

At the country level, this range spans from gas consumption equivalent to that of Australia or Turkey (low case) to volumes exceeding China's imports by more than 50% (or triple that of Japan and Germany) in the high case.

For this reason, some industry representatives argue that a potential LNG supply glut could be absorbed by sustained demand growth driven by new AI-related needs, coupled with broader demand growth in Asia and Europe, tightening global gas markets by 2030 (Gas Processing & LNG 2026).

Whether AI-related gas demand materializes at the high end of the range will depend on existing data center deployment capabilities, as well as access to competitively priced gas.

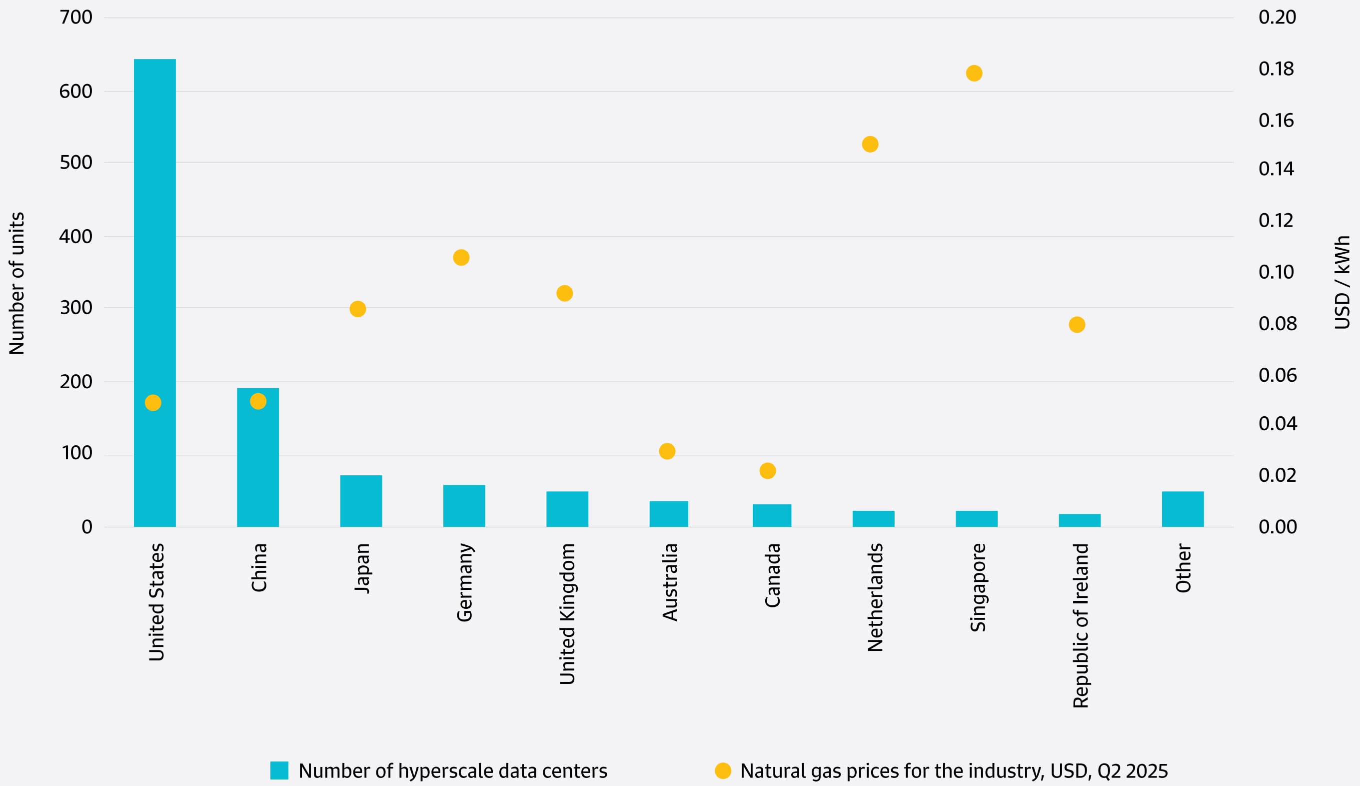
Over the next five years, Asia Pacific (APAC) is expected to be the fastest-growing region for new data centers, led by China, Japan, Australia, and Singapore (Goldman Sachs 2025). However, as shown in Figure 2, countries such as Australia and China may have an advantage over neighbors such as Singapore and Japan because of lower industrial gas prices. The U.S. could remain one of the global AI leaders because of its abundant domestic supply and lower power costs. For instance, powering the expected 606 TWh in the U.S. in 2025 with gas would cost about $29 billion, while in Singapore the cost of providing the same amount of energy with gas would triple to $107 billion.[2] However, the U.S. is facing severe infrastructure bottlenecks (long interconnection queues, limited transmission line capacity, permitting delays, etc.), which, coupled with global constraints on gas turbine supply, might put new data center projects in question.

More broadly, access to secure and affordable gas supplies may become a differentiating factor. While the U.S. has abundant natural gas production, China (like many other countries participating in the data center race) is heavily reliant on imports and must consider securing stable, affordable gas supplies through long-term contracts.

For the reasons outlined above, there is a high probability that new data center hubs will emerge in regions with access to diverse low-cost energy sources. In this regard, Saudi Arabia is uniquely positioned to become a reliable regional data center hub, supported by abundant natural gas resources as well as other low-cost energy solutions (Almasoud and Bin Maged 2026).

2 Calculation: 606 TWh (U.S. data center energy demand projected for 2030 by McKinsey in Table 1) × $0.048/kWh (average industrial gas price in the United States reported by GlobalPetrolPrices.com 2025) = $29.088 × 10^9, or $29.088 billion. For Singapore, 606 TWh × $0.177/kWh (GlobalPetrolPrices.com 2025) = $107.262 × 10^9, or $107.2 billion.

Figure 2. Hyperscale data centers and industrial gas prices by country.



Notes: Hyperscale data centers are facilities operated by hyperscalers (Amazon, Microsoft, Google, etc.), typically exceeding 900 m^2 in size and consuming more than 1 megawatt of power. Only hyperscale facilities are considered, as including smaller data centers would overstate their system impact and obscure where actual power demand is concentrated. The U.S. accounts for 44% of global installed hyperscale data center capacity. Europe accounts for 17%, with China closely following at 16%. The rest of Asia Pacific accounts for 14%, while Latin America and the rest of the world account for 5% and 4%, respectively.

Source: Author, based on Leichter (2025) and GlobalPetrolPrices.com (2025).

05 Conclusion

The analysis shows that AI-driven data center growth could become a nontrivial new source of natural gas demand by 2030, although the magnitude remains highly uncertain. Depending on assumptions about electricity demand growth, countries' ability to secure the necessary equipment and build the projected data center capacity, as well as the share of natural gas in meeting that demand, additional gas consumption could range from a modest 47 bcm to as much as 130-270 bcm globally (the upper value is equivalent to roughly triple Japan's annual consumption).

While the lower end of this range would have limited implications for global markets, higher-end scenarios would represent a meaningful increase in gas demand over a relatively short period, comparable to the consumption of major importing countries and significant relative to recent global demand growth rates.

Natural gas is well positioned to capture a substantial share of this emerging demand, driven by data centers' specific operational requirements, including the need for reliable baseload power, rapid deployment, and proximity to load centers amid grid constraints. Limitations in the pace of renewable expansion, lengthy permitting processes, and growing interest in on-site or hybrid generation solutions further reinforce the role of gas-fired power. As data center deployment accelerates unevenly across regions, access to competitively priced natural gas and existing infrastructure will be a key differentiator, with important implications for gas producers, LNG exporters, and countries seeking to position themselves as future digital and AI hubs.

References

Almasoud, Yazid, and Ammar Bin Maged. 2026. "Saudi Arabia's Data Centre Expansion: Regulatory Framework and Strategic Considerations." *Greenberg Traurig LLP*, January 5. https://www.gtlaw.com/en/insights/2026/1/saudi-arabias-data-centre-expansion-regulatory-framework-and-strategic-considerations.

BloombergNEF (BNEF). 2025. "Power for AI: Easier Said Than Built." *Bloomberg New Energy Finance*, April 15. https://about.bnef.com/insights/commodities/power-for-ai-easier-said-than-built/.

Electric Power Research Institute (EPRI). 2024. *Powering Intelligence: Analyzing Artificial Intelligence and Data Center Energy Consumption*. 2024 White Paper. https://restservice.epri.com/publicdownload/000000003002028905/0/Product.

Franke, Andreas. 2025. "Global Data Center Power Demand to Double by 2030 on AI Surge: IEA." *S&P Global*, April 10. https://www.spglobal.com/energy/en/news-research/latest-news/electric-power/041025-global-data-center-power-demand-to-double-by-2030-on-ai-surge-iea.

Gas Processing & LNG. 2026. "Rising AI Power Needs Could Turn LNG Supply Glut into a 2030 Shortage, Says QatarEnergy CEO." February 2. https://gasprocessingnews.com/news/2026/02/rising-ai-power-needs-could-turn-lng-supply-glut-into-a-2030-shortage-says-qatarenergy-ceo/.

GlobalPetrolPrices.com. 2025. "Natural Gas Prices for the Industry: World Map." https://www.globalpetrolprices.com/map/natural_gas_industrial/.

Goldman Sachs. 2025. "AI to Drive 165% Increase in Data Center Power Demand by 2030." February 4. https://www.goldmansachs.com/insights/articles/ai-to-drive-165-increase-in-data-center-power-demand-by-2030.

Green, Alastair, Humayun Tai, Stephen Noffsinger, and Pankaj Sachdeva. 2024. "How Data Centers and the Energy Sector Can Sate AI's Hunger for Power." McKinsey & Company, September 17. https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power.

Harder, Amy. 2025. "AI Power Demand to Grow Tenfold by 2030, New Report Says." *Axios*, October 7. https://www.axios.com/2025/10/07/ai-power-cost-demand-future.

International Energy Agency (IEA). 2025. *Energy Supply for AI*. https://www.iea.org/reports/energy-and-ai/energy-supply-for-ai.

International Gas Union (IGU). 2025. *Global Gas Report 2025*. September 10. https://www.igu.org/igu-reports/global-gas-report-2025.

International Gas Union (IGU). 2026. *The Role of Gas in Powering AI-Driven Energy Demand*. https://www.igu.org/igu-reports/the-role-of-gas-in-powering-ai-driven-energy-demand.

Leichter, Rasmus. 2025. "Number of Data Centers by Country (November 2025)." *CargoSon*, November. https://www.cargoson.com/en/blog/number-of-data-centers-by-country.

MARA. 2025. "MARA Energizes Full 25 MW Micro Data Center Initiative Powered by Associated Natural Gas." April 9. https://www.mara.com/posts/mara-energizes-full-25-mw-micro-data-center-initiative-powered-by-associated-natural-gas.

Poudineh, Rahmatallah. 2025. *Global Electricity Demand: What's Driving Growth and Why It Matters?* OIES Energy Comment. Oxford Institute for Energy Studies (OIES). https://www.oxfordenergy.org/wpcms/wp-content/uploads/2025/01/Global-electricity-demand.pdf.

Research by nicoxz. 2026. "The First Round of Investment between Japan and the United States in the United States, Starting with Gas Power Generation, Ports, and Artificial Timetables [日米対米投資の第1弾、ガス発電・港湾・人工ダイヤで始動]." February 8. https://research.nicoxz.com/articles/japan-us-investment-gas-power-diamond.

Sung, Ho-chul. 2025. "U.S.-Japan Unveil $550 Billion Power, AI Investment." *The Chosun Daily*, October 30. https://www.chosun.com/english/world-en/2025/10/30/VT4O74J63REXTNOLG5VDF6NCN4.

U.S. Department of Energy (U.S. DOE). 2024. "DOE Releases New Report Evaluating Increase in Electricity Demand from Data Centers." December 20. https://www.energy.gov/articles/doe-releases-new-report-evaluating-increase-electricity-demand-data-centers.