



UAE Data Center Capacity to Surge 165% by 2028

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The UAE's data center landscape is experiencing unprecedented growth, with total capacity set to increase from the current 358 MW to approximately 950 MW by 2028, representing a 165% increase over current capacity. This expansion is being led by Khazna Data Centers, the largest player in the UAE market, which is investing USD 1.28 bn across five new facilities currently under construction. These projects will collectively add approximately 210 MW of capacity. Growth is further accelerated by major AI infrastructure developments, including the first phase of the G42 Stargate AI campus, which alone will contribute 200 MW by mid 2026. Currently, the UAE operates 35 data centers, with 18 in Dubai, 16 in Abu Dhabi, and 1 in Fujairah.

Data Centers' Energy Consumption Will More Than Double from 5.6 to 12.6 TWh by 2028

Data centers in the UAE operate at an estimated 98.7% utilization rate, reflecting strong demand. Current consumption is approximately 5.6 TWh annually. With capacity expanding to 950 MW by 2028 and assuming modest efficiency gains that bring average Power Usage Effectiveness (PUE) down from 1.8 to 1.6, annual energy use at 95% utilization is projected to reach approximately 12.6 TWh. This represents a 127% increase, equivalent to over 6% of total national electricity consumption.

Cooling Challenges and Efficiency Improvements

The Middle East faces significant cooling challenges due to extreme heat, resulting in some of the highest PUE ratings globally, averaging around 1.79 compared to the global average of 1.56 and Europe's 1.46. With summer temperatures reaching 50°C, substantial energy is required for cooling, causing challenges for efficiency. However, technological advancements including adiabatic free cooling, direct liquid cooling and AI driven optimization are improving efficiency in newer facilities. Leading operators such as Khazna are targeting PUE values below 1.5, while Equinix reports achieving between 1.4 and 1.5 in its best performing Middle Eastern sites.

UAE: A Global Leader in AI Readiness and Infrastructure

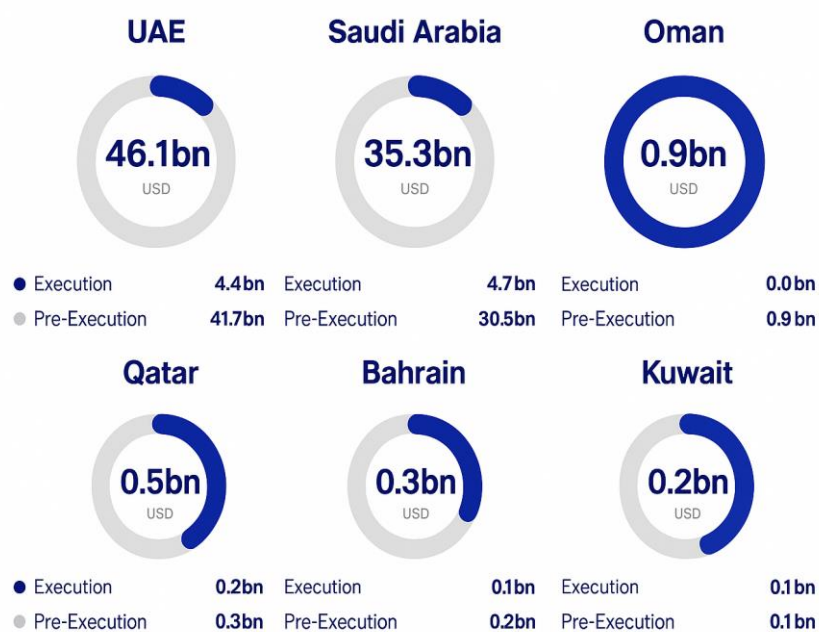
The UAE has positioned itself as a major global player in AI development. Stanford University's Global AI Vibrancy Tool in 2024 ranked the UAE 5th globally, while Oxford Insights' Government AI Readiness Index placed it 13th out of 188 countries. Backed by strong infrastructure, the country has deployed over 188,000 AI chips and 6.4 GW of computing power capacity. A 2025 Technology Resource Group study ranked the UAE 2nd globally in AI development based on supercomputing power, company activity, and government readiness. The Coursera Global Skills Report 2025 ranked the UAE 1st in the Arab world and 32nd globally for AI maturity.

USD 46.1 bn Investment Pipeline Underpins Capacity Expansion

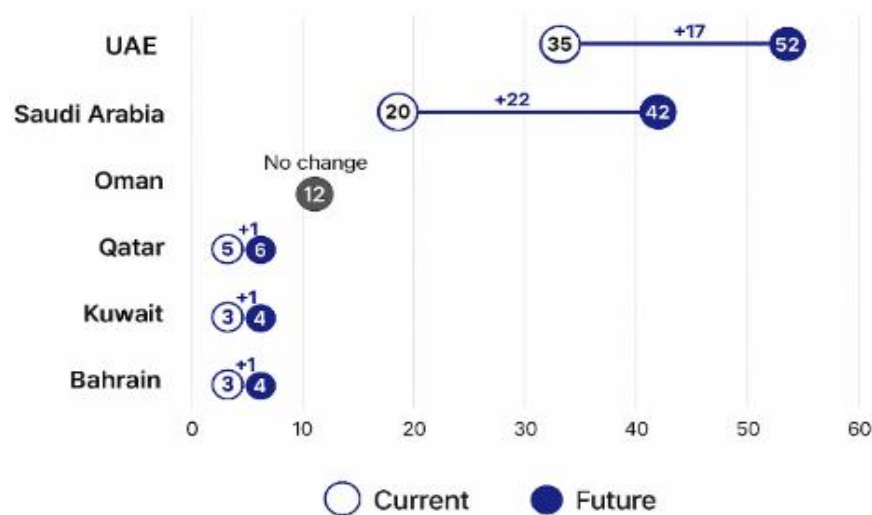
The UAE leads the GCC in data center investment, with a total pipeline of USD 46.1 bn ahead of Saudi Arabia's USD 35.3 bn. The UAE accounts for approximately 55% of total GCC data center investment. The UAE is reinforcing its dominant position as the leader in the number of data centers in the region by adding 17 new data centers that are currently in the execution phase.



GCC Data Centers Investments



Number of Data Centers



Source: Meed, Emirates NBD Research.



The G42 AI Campus Will Consume More Electricity Than Denmark

The planned 5 GW G42 AI Campus will be the largest data center campus outside the United States. While no completion date has been announced, at 80% utilization and 1.4 PUE, the campus would consume approximately 49.1 TWh annually, which is more than the total electricity consumption of Denmark at 36.1 TWh, Ireland at 34.5 TWh, or New Zealand at 45.0 TWh.

Power Sources for the G42 AI Campus

The G42 AI Campus will draw from a mix of nuclear, solar, and natural gas. The Barakah Nuclear Energy Plant, comprising four APR1400 reactors, produces about 40 TWh annually, equivalent to 25% of the UAE's total electricity generation. However, even with Barakah's 5.6 GW capacity and 90% uptime, its generation alone would not be sufficient to power the entire G42 Campus, which would require 49.1 TWh annually at full capacity. To address this, the UAE is developing a 1 GW clean power facility with advanced battery storage, led by Masdar, to ensure uninterrupted renewable power supply alongside nuclear and gas based generation.

USD 28.2 bn Power Pipeline to Meet Surging Demand

To meet rising electricity demand from both data centers and population growth, the UAE is investing heavily in new energy infrastructure. The country plans to add 21,714 MW of power generation capacity by 2030, led by solar, which will contribute 12,064 MW by the end of the decade. With one of the highest solar capacity factors globally, estimated at 20 to 25%, the UAE is expected to generate 46.7 TWh annually from solar by 2028. However, due to the intermittent nature of solar energy, 24 hour operations such as data centers require supplementary sources and storage solutions. This has driven a diversified energy strategy combining nuclear power from Barakah, natural gas, and advanced storage technologies such as Masdar's new battery systems.

Global Data Centers Racing Toward 1,000 TWh by 2030

Globally, data centers consumed approximately 415 TWh in 2024, or about 1.5% of global electricity demand. The International Energy Agency projects this will more than double to 945 TWh by 2030, equivalent to Japan's entire annual electricity consumption. AI is the key driver, with AI optimized servers accounting for 24% of server electricity use and 15% of total data center demand. Power demand from AI optimized data centers is expected to quadruple by 2030, growing 30% annually.

Major economies compete for data center dominance

According to the International Energy Agency, the United States leads the global surge with data center electricity consumption expected to increase by approximately 240 TWh, representing 130% growth and potentially reaching 580 TWh by 2028. This would represent up to 12% of total US electricity consumption, with data centers consuming more electricity than all energy-intensive manufacturing combined. Power consumption by data centers is on course to account for almost half of the growth in US electricity demand between now and 2030.

China follows closely with a projected increase of 175 TWh, representing 170% growth by 2030. The country already accounts for approximately 25% of global data center electricity consumption and continues to expand its digital infrastructure at a remarkable pace, driven by high demand from industry and data centers, increased cooling needs, and rising electric vehicle charging requirements.

The IEA projects that Europe's data center electricity consumption will grow by more than 45 TWh, a 70% increase by 2030, though this represents a more moderate growth rate compared to other major markets. Growth is concentrated in traditional hub markets including Frankfurt, London, Amsterdam, Paris, and Dublin, which currently account for approximately half of Europe's data center consumption. Ireland and the Netherlands face particularly high concentrations,



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with data centers consuming up to 21% and 5.4% of their respective national electricity supplies.

Emerging markets in the Nordic region such as Sweden, Norway, and Denmark are expected to see demand triple by 2030, while Southern Europe could see three to five fold increases by 2035.

Mayed AlRashdi Economics Research Manager

mayeda@emiratesnbd.com



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