2026

July

Intelligent Energy: Strategies for Data Centre Growth in the Gulf

Energy Research Paper

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Gulf data centre capacity is rising rapidly, with more than US$ 8.5 billion in new investments planned by 2027 and Saudi Arabia alone accounting for up to 80% of the region's new power capacity for data centres. In response, governments across the Gulf are investing heavily in intelligent data centres, AI-powered energy management, and cloud infrastructure to expand capacity and strengthen digital resilience. These tech ecosystems increasingly integrate renewable energy sources, positioning Gulf economies to handle growing data volumes securely, sustainably, and competitively on a global scale. How will rising data centre demand affect overall electricity consumption and national energy strategies in Gulf countries? What approaches are Gulf states using to power data centres with renewables versus conventional generation?

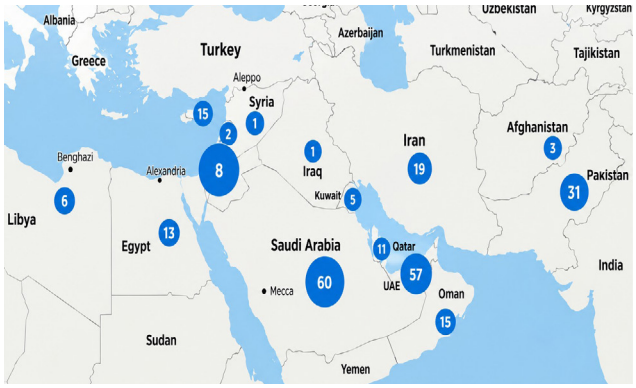
ENERGY RESEARCH PAPER

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current energy topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.

- The GCC's data centre and AI sector is entering a rapid expansion phase, led by Saudi Arabia, the UAE and Qatar. Major announced programmes total roughly 12.8 GW, 8.1 GW and 1.8 GW respectively, supported by state-backed investors and partnerships with global technology companies.
- This build-out could add electricity demand equivalent to about 10% of current installed capacity in Saudi Arabia and Qatar and 20% in the UAE by the early 2030s. The requirement is manageable, but it will demand timely investment in generation, transmission, gas supply, renewables, batteries and grid equipment.
- The GCC region is highly competitive for data centre deployment because of low-cost energy, abundant capital and land, rapid permitting, supportive governments and strategic connectivity in its location between Europe and South Asia. Falling grid carbon intensity further strengthens the case for Gulf-based facilities.
- Key risks include physical and cyber security, especially during the current Gulf conflict; large financing needs; US–China technology tensions; and the GCC's hot climate, which raises cooling demand and reduces energy efficiency versus many other global locations. Desalinated water demand is comparatively modest and affordable, especially if direct liquid cooling and other water-saving technologies are adopted.
- The GCC's massive strategic investments in international data centres and AI companies can bring insights and access to strategic technologies to be deployed at home. Nevertheless, they need to ensure their overseas projects also plan adequately for energy needs and manage the relevant stakeholders.
- To sustain their data centre growth, GCC states should prioritise solar, wind and battery deployment; secure flexible gas-fired backup; accelerate advanced cooling and energy-management technologies; and integrate data centres into national power planning. Dynamic pricing and workload shifting could also turn data centres into flexible grid assets while AI supports wider energy and water efficiency gains and the development of breakthrough technologies.

Saudi Arabia and the UAE have been the main exponents of data centre development in the GCC, with 60 and 57 facilities respectively. They are followed by Oman with 15, Qatar with 11, Bahrain with 8 and Kuwait with 5 (Figure 1). Their governments, national oil companies and other important entities have been enthusiastic adopters of AI. The UAE and Qatar (though not any other GCC countries) are members of the US-led Pax Silica initiative on developing the silicon and semiconductor supply chain[II].

Figure 1 Number of Data Centres in Middle East Countries [III]



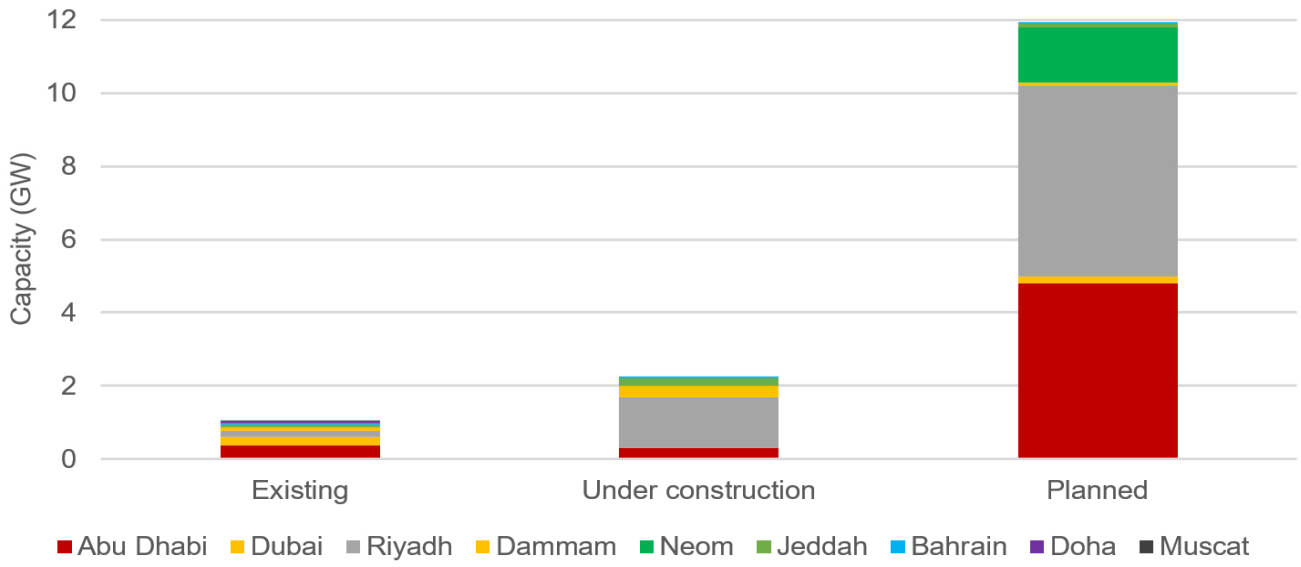
More important than the existing portfolio is an ambitious programme of construction (Table 1). Some of these may be cancelled or delayed; on the other hand, this list does not capture all projects, and further ones are likely to be announced. Note that not all of these relate to specific projects; some are more aspirational corporate targets.

This selection of major announced projects and programmes adds up to approximately 1.8 GW in Qatar, 12.8 GW in Saudi Arabia, and 8.1 GW in the UAE. This compares to current installed capacity of 12.6 GW in Qatar, 43 GW in the UAE and 121 GW in Saudi Arabia. The data centre projects therefore amount to about 10% of current installed capacity in Saudi Arabia and Qatar, and about 20% in the UAE.

Table 1 Selected GCC Data Centre Investments and Targets

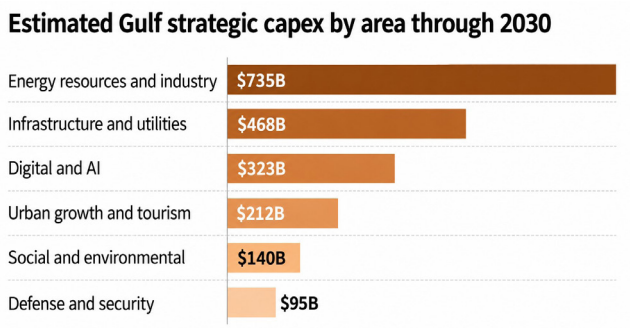
GCC country	Company	Data Centre Investments
Bahrain	Batelco / Qareeb	14 MW to expand to 50 MW
Qatar	Qai (with Brookfield)	$20 billion (~1.8 GW)
Saudi Arabia	HUMAIN	1.9 (2030) → 6.6 GW (2034) target 1.5 GW (in Neom)
	with AirTrunk	$3 billion (~270 MW)
	with Amazon	$5 billion (~450 MW)
	with Cisco/AMD	1 GW
	with Saudi Telecom	1 GW
	with xAI	500 MW
	Khazna	1+ GW
	SDAIA	480 MW
UAE	MGX/G42	KIZAD Data Campus 5 GW Stargate UAE 1 GW
	Khazna	210 MW (2025), 1+ GW (2030)
	center3	145 MW (2025)
	Du (Dubai)	1 GW

Figure 2 Forecast Growth in GCC Data Centre Capacity[v]



About 1 GW of capacity is operational today, just over 2 GW under construction, and about 12 GW planned (Figure 2). Most capacity today is in Abu Dhabi, Dubai and Riyadh, while growth is mainly in Abu Dhabi and Riyadh. There is some spread outside the established centres, with future expansion in Neom (north-western Saudi Arabia's planned city), Dammam, Jeddah, Doha and Muscat. Construction on the 100 MW first phase of the 360 MW data centre planned for Oxagon, the industrial city in Neom, began on 1 September 2026[iv].

Figure 3 GCC Strategic Spending to 2030[VI]



Digital and AI is estimated to be the third-largest area for GCC strategic investment by private and state-owned entities (not direct government budgets) to 2030 (Figure 2), with $323 billion spent.

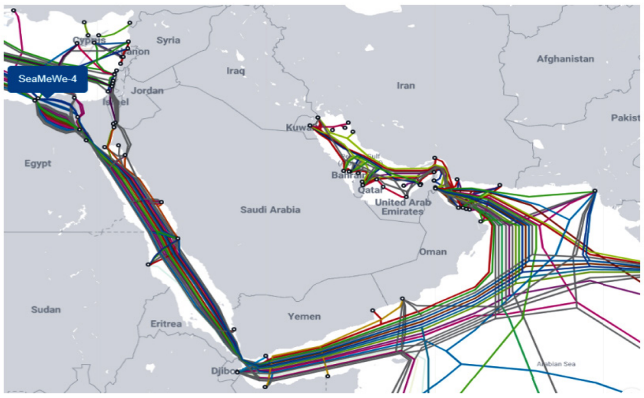
GCC countries have launched well-funded, state-backed AI and data centre companies, notably:

- HUMAIN, owned by Saudi Arabia's Public Investment Fund (PIF) with state oil company Saudi Aramco as a significant minority shareholder.
- MGX, a joint venture between Abu Dhabi's strategic investment company Mubadala and G42, an artificial intelligence and cloud computing company controlled by Sheikh Tahnoon bin Zayed Al Nahyan, the UAE's National Security Adviser.
- Qai, launched by the Qatar Investment Authority in December 2025.

The GCC has become a key location for global data centre construction because of several inherent and created advantages:

- Low energy costs, for both fossil (gas-fired) and non-fossil (solar and wind) power
- Rapid construction times for new power generation and familiarity with meeting rapid electricity demand growth
- Low capital costs of construction
- Large areas of available land
- Little community opposition, unlike the growing movement against data centre construction in the US
- Rapid approval and permitting times
- Highly supportive, capable governments
- Open economies, with quite free movement of capital and labour, and low taxation
- Abundant capital, both private and state
- Strategic investments in key international technology companies
- Generally good political relations with all key global centres of technology and investment
- Central geography between two key economic engines of Europe and South Asia

Figure 4 Middle East Subsea Cable Routes[VII]



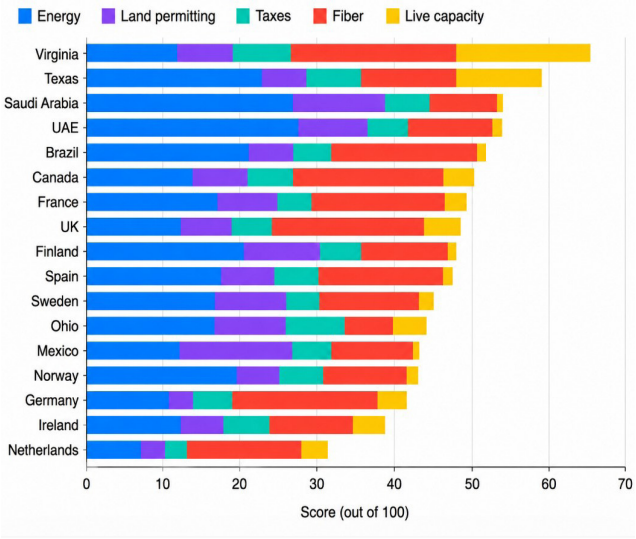
The preferred location does depend on the balance of data centre use for training and storage, and uses such as cryptocurrency mining, which can be remote from demand, versus inference (answering queries), streaming, cloud apps and digital payments, which are preferably located close (within 80-160 km) to demand to minimise latency[VIII]. The GCC's high-tech but relatively small population may limit the amount of low-latency data centres required. The growth in training may slow as models mature and existing data sets are fully incorporated.

These advantages have seen GCC countries attract a wide range of the leading tech companies, including Nvidia, Amazon, Microsoft, Cisco Systems[IX], Advanced Micro Devices, xAI and OpenAI.

These factors lead to GCC countries ranking towards the top of assessments of data centre attractiveness (Figure 5). BloombergNEF, for example, places Saudi Arabia third and the UAE fourth, behind Virginia and Texas (it did not list other Middle Eastern jurisdictions). To improve their ranking further, the GCC countries would have to increase their fibre connectivity and deploy more live capacity.

Skilled labour costs are also about 15-25% higher than in other global centres, so it would be important to attract and develop more locally based talent.

Figure 5 Attractiveness of Middle East for Data Centres[X]



The GCC, though, also faces significant challenges to its data centre ambitions, which revolve around four core issues:

- Security
- Finance
- Politics
- Climate

Security concerns are dominated by the US/Israeli war against Iran, which began in February 2026 and is continuing at the time of writing. During the conflict, data centres have come under Iranian attack. Media reports and Iranian claims indicated strikes on data centres in Bahrain in March, April and July 2026[XI], and on the UAE in March and April 2026[XII]. Data centres' need for cooling makes them easily identifiable targets. Hardline Iranian newspaper Kayhan has also advocated cutting fibre-optic cables beneath the Strait of Hormuz[XIII]. Additional modes of attack could include cyberattacks and sabotage.

Other than this, the GCC states have generally been seen as secure and stable places. Investment in data centres in Saudi Arabia and the UAE has continued despite the war[XIV]. Some security measures can be adopted, including disguising the location of data centres, adding perimeter walls and server protection, potentially raising capital costs by 5-7%. The war has caused regional data centre operators to rethink where to place back-up. Moving back-up out of the country or even out of the region may improve resilience, but it will mean slower connections, and potential dependence on cables which are themselves vulnerable. Data sovereignty rules also often prevent storage outside the relevant country[XV].

Iranian motivation includes causing economic damage to American companies; retaliating for alleged GCC support for US combat operations; and destroying facilities that may be serving the US military and intelligence services. The vulnerability of data centres will remain until there is a satisfactory peace arrangement.

Financial challenges relate to the very large investment needs of data centres at a time of serious competing priorities. While the GCC countries' financial capacity is large, it is not infinite. Saudi Arabia and the UAE have made very large financial commitments to AI investments. If half of Saudi Arabia's AI and cloud expansion is met by 2030, it will require $42 billion of capital, of which $32 billion would be provided by debt[XVI]. This would require contributions from regional and international lenders, who have their own priorities and assessment of GCC risks.

Substantial capital will be required for security, resilience and reconstruction of war-damaged infrastructure. GCC countries whose access for oil and gas exports has been severely constrained during the conflict – Bahrain, Kuwait and Qatar – may prefer to limit investments to avoid undue exposure and drawdown of their other sovereign wealth holdings. This is magnified by the risk of a potential deflation of the stock valuations of the AI sector if current ambitious expectations are not met or sentiment changes.

The cost of capital is rising because of competition for AI-related investment, high sovereign borrowing in the US and in other developed countries, and the war-related costs in the Gulf [XVII]. The GCC currencies are pegged to the dollar, and so their borrowing costs will rise if the US raises interest rates, despite the GCC's much better fiscal position. Capex for data centres by the five biggest US tech companies is estimated at almost $700 billion in 2026 and $5.3 trillion by 2030. Within the GCC, there are about 170 planned data centres at a cost of $93 billion.

Political barriers mostly relate to the competition in AI between the US and China. GCC countries, though generally Western-friendly, have sought to deal with all major players in the technology space[XVIII]. But Washington has raised concerns about Gulf engagement with Chinese telecommunications giant Huawei[XIX], and more generally about the risks of intelligence and technology leakage.

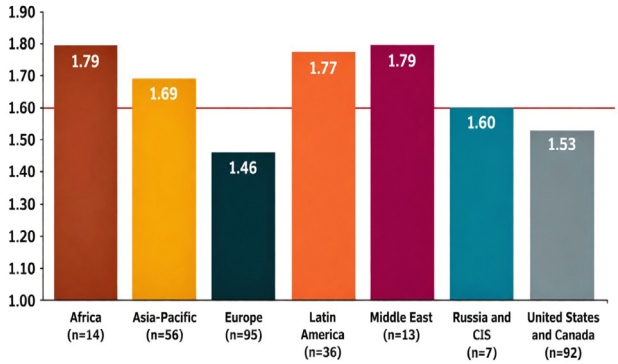
G42 is reportedly considering selling a majority stake to US investors, to satisfy requirements for its access to the most advanced AI chips[XX].

In 2024, it said it had scaled back its position in China, to alleviate American concerns over leakage of crucial technology. Soon afterwards, Microsoft invested $1.5 billion in it.

HUMAIN has said that it will not provide access to its computing centres for China to train models, only for inference.

Climate concerns relate to the region's hot, arid environment. Data centres require large amounts of cooling, reflected by their Power Usage Effectiveness (PUE), indicating the total energy consumption divided by the compute consumption. The GCC's high temperatures mean that it has high PUE, i.e. low effective use of energy for computing (Figure 6). The Middle East average PUE of 1.79 is (with Africa) the highest globally. Europe, with a relatively cool climate, has the best PUE with 1.46. Other factors as well as ambient temperature also affect PUE, notably the age and choice of equipment, and the design of the data centre. Europe's good PUE therefore also partly reflects its high electricity costs and hence attention to energy efficiency, while the Middle East's poor PUE may relate to low energy costs where efficiency has not been a high priority historically.

Figure 6 Power Usage Effectiveness for Data Centres across Major Global Regions[XXI]

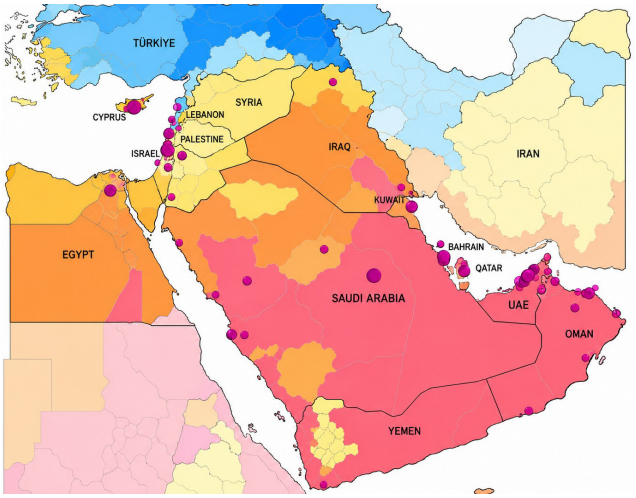


The Middle East, and specifically the GCC, has the highest ambient temperature of any major region for data centre development globally (Figure 7). Average annual surface temperatures are above 27°C across all the GCC, except for parts of Saudi Arabia. Summer daytime temperatures exceed 40°C and humidity is also high along the coast. The urban heat islands and the impact of global warming further worsen the problem. Temperatures in the Gulf region are increasing at up to 0.6°C per decade, twice the global average[XXII].

Not surprisingly, the combination of a hot climate and an investment boom make the Middle East an active and fast-growing area for investment in data centre cooling (Figure 8). Despite this growth, the Middle East-Africa region remains fourth behind North America, Asia and Europe.

These cost factors can be combined to assess the overall economic competitiveness of the GCC versus other locations (Figure 9).

Figure 7 Average Annual Surface Temperature and Location of Major Data Centres[XXIII]



This suggests that the UAE in particular ranks well; Saudi Arabia features well on electricity costs but has higher average capital costs. HUMAIN's chief executive says that its compute is about 30% cheaper for customers than elsewhere in the world [xxv].

Abu Dhabi provides incentives for data centres, including cheaper electricity, which improve its ranking; these, though, might not be sustainable if there is a large build-out of capacity. Only locations in India and China (Mumbai and Shanghai) have both relatively inexpensive electricity and lower capital costs than in Abu Dhabi, and only a few locations, mostly in the southern US, have comparably cheap electricity.

Figure 8 Data Centre Cooling Market by Major Global Regions (US$ Billion) [xxiv]

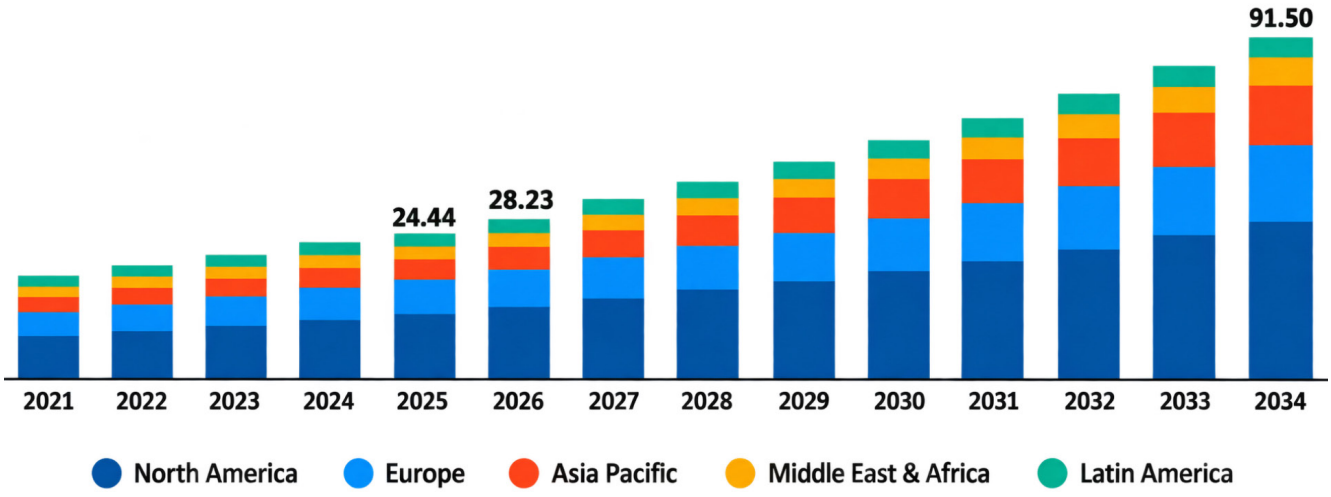


Figure 9 Capital Cost and Electricity Price for Major Global Data Centre Locations [xxvi]

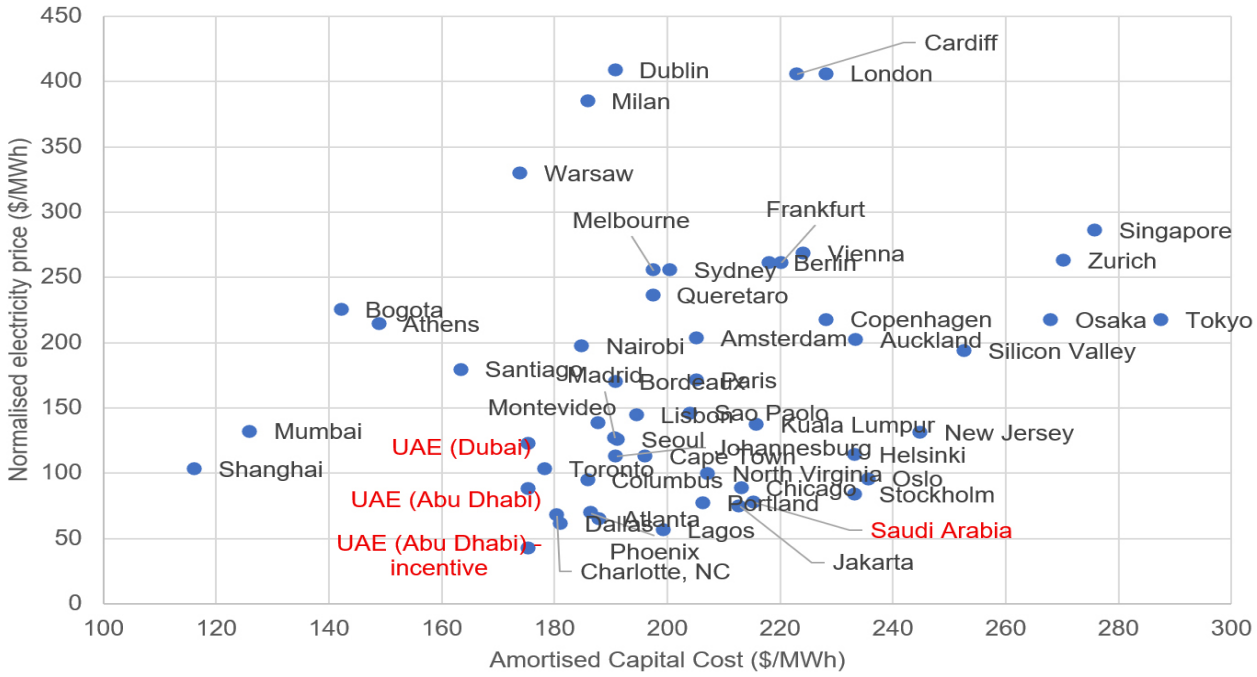
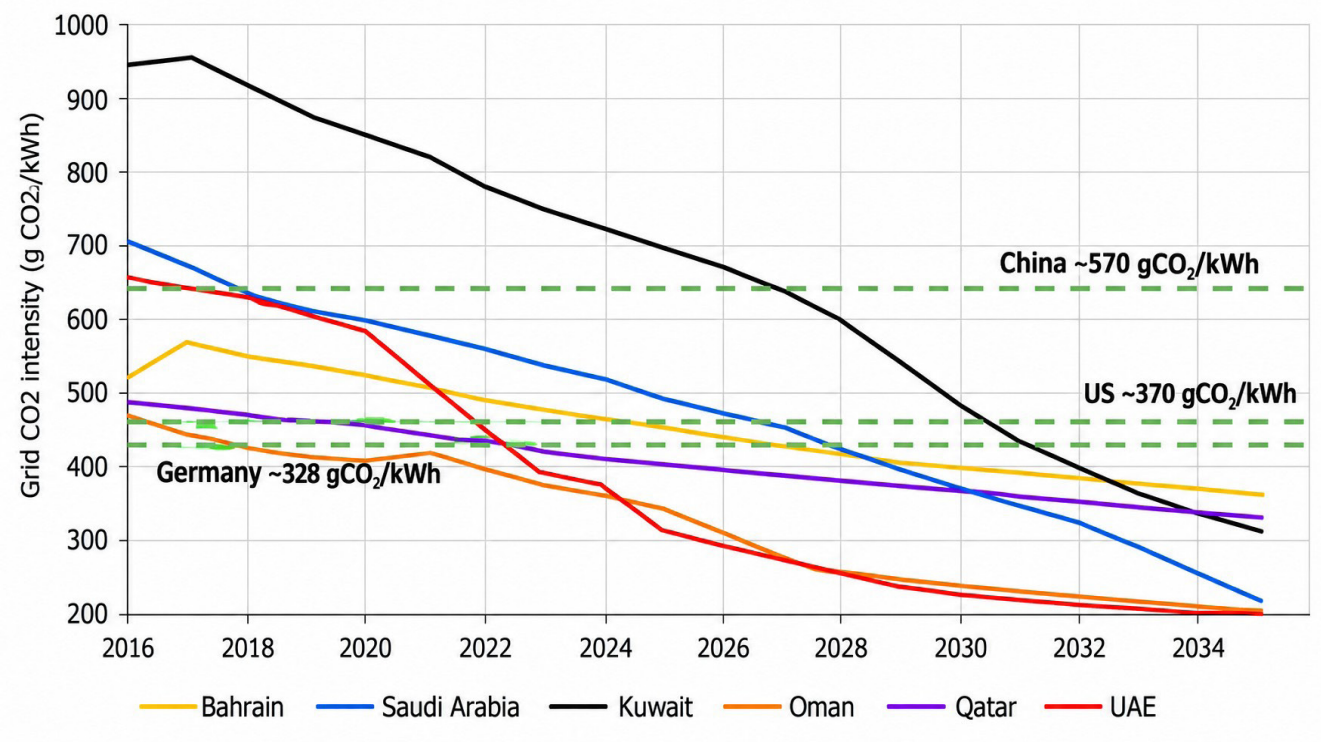


Figure 10 Carbon Footprint of Middle East Electricity Grids and Major Global Benchmarks [XXVII]



Dubai electricity is more costly but still very competitive on a global scale. Full data was not available for other GCC locations, but it is likely that Qatar would rank favourably because of its low-cost electricity.

GCC locations also rank highly on the criterion of carbon intensity (Figure 10). Grid carbon intensities are falling in most countries because of a growing share of renewables and, in some places, nuclear power. The thermal efficiency of traditional gas- and coal-fired generation is also improving. Grid carbon intensities in the UAE, Qatar and Oman are already below those of the US and Germany, while Saudi Arabia is seeing significant improvement as it replaces oil-fired power with gas and renewables.

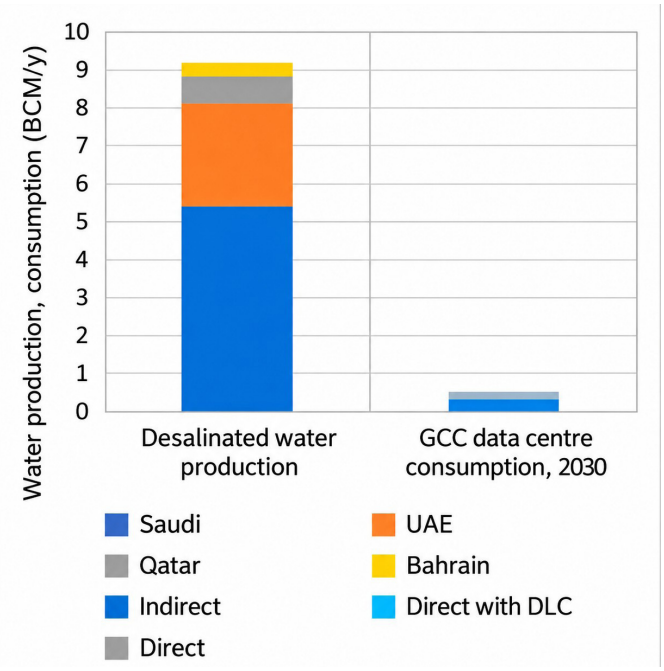
One other factor for data centres which is often mentioned in connection with the GCC is water. Data centres use water for cooling, and small amounts for humidification to stop static electricity.

The GCC is a region with very low natural water resources. It is, however, the most important area for desalination worldwide. Desalination has undergone significant improvements in recent years, with gains in scale, and the switch to membrane-based reverse osmosis, from the older thermal methods, improving energy efficiency, increasing flexibility, and allowing the use of renewable electricity for water production. The extra water consumption from even a large GCC data centre buildout is small compared to current desalinated water production: approximately an additional 0.45 billion cubic metres per year (BCM), compared to current output of about 9 BCM, or a 5% increase, most of which is indirect water use (for cooling power plants). Various water-saving technologies, notably the use of direct liquid cooling (DLC), could reduce direct water consumption significantly, from about 0.15 BCM to 0.017 BCM annually.

Costs have also fallen significantly. The Hassyan RO plant in Dubai, due for commissioning in early 2027, achieved a tariff of $0.365-0.389 per cubic metre, for the project awarded in 2023[XXVIII], while Jubail 3 in Saudi Arabia was awarded[XXIX] at approximately $0.41 per m^3. In comparison, costs in Saudi Arabia in 2010 were estimated[XXX] at $0.8-1.09 per m^3.

For a typical 100 MW data centre, daily water consumption at reasonable efficiencies would be about 1.8 million litres per day, or up to 2.8-4 million litres daily for a plant in a hot climate or with low efficiency[XXXI]. At recent GCC desalination rates, this would cost from $700-1600 per day. This compares to the electricity bill, which in Abu Dhabi would be from $100,000-160,000 per day[XXXII]. Electricity is approximately half the total operational bill; therefore desalinated water represents only about 0.5% of operational costs.

Figure 11 Water Production and Data Centre Consumption For GCC



Planned and proposed data centre projects amount to about 10% of current installed electricity generation capacity in Saudi Arabia and Qatar, and 20% in the UAE, up to 2030 to 2034, depending on the country. Since data centres aim to run at close to 100% capacity, the impact on required electricity generation is higher than that on capacity (the majority of GCC residential electricity consumption is for air-conditioning, which is hardly required during the winter).

HUMAIN has secured a commitment from the Saudi Ministry of Energy to supply 16 GW of electricity. As its target for installation within the country is 6 GW by 2034, this gives it considerable room for faster expansion or growth after 2034.

As noted, the UAE's proposed data centre programme from major identified projects reaches 8.1 GW by 2030.

However, the Emirates Water and Electricity Company (EWEC), the country's main utility, plans for 5.1 GW of data centres by 2030. This partly reflects that some of the planned construction, at least 1 GW in Dubai, lies outside the area served by EWEC. It may also represent the less mature and somewhat speculative nature of some of the programme.

EWEC intends to build about an additional 13.5 GW of generating capacity by 2030[xxxiii]. Some of this is replacing older gas-fired capacity to be retired or mothballed; some is meeting the expected general growth in the population, economy and industry; and some is serving the electrification of end-uses (mostly in industry, particularly the oil and gas sector, but to a small but growing extent, electric vehicles). Of this planned new capacity, about 5 GW is combined-cycle gas turbines (CCGTs), 4 GW is batteries, and 4 GW solar photovoltaic.

By 2030, EWEC will have installed 17.5 GW of solar, and by 2035, this will have reached 30 GW. A partial alternative to EWEC's plan would be to expand the existing Barakah nuclear power plant by adding another two reactors totalling 2.8 GW.

Correspondingly, ADNOC Gas, the dominant national provider, raised its estimates for gas demand growth by 2030 to 6% per year in November 2024, up from 2% per year at the time of its IPO in March 2023.

In 2025, the UAE generated 192.7 TWh of electricity, of which 62.4 TWh came from "clean" sources (renewables and nuclear)[xxxiv]. The envisaged 8.1 GW of data centres would consume 71 TWh if running at full capacity.

The required additional capacity to serve data centres is therefore substantial, almost 40% of the planned growth to 2030. The impact would be less in Saudi Arabia and Qatar, where the planned data-centre buildout represents a smaller share of current installed capacity. Saudi Arabia anyway has a very active programme of replacing oil-fired power plants and constructing new renewable and battery capacity.

The required build-out of generating capacity within the GCC to serve the expansion of data centres is therefore achievable, and within historic rates, but still a significant commitment. The reliance on gas-fired power is also potentially problematic given long lead-times for the delivery of turbines. Solar PV and batteries, in contrast, have no serious constraints to installation because of the huge expansion of Chinese manufacturing capacity. Securing sufficient land in time may, however, be a constraint in the smaller and more densely populated GCC countries, especially the UAE, Bahrain and Qatar.

The global shortage of power transformers is also a problem for the expansion of electrical grids in general[xxxv]. There is now a waiting time of 30-35 months for transformers, up from 12 months before 2020.

17 DATA CENTRE EFFICIENCY CAN BE BOOSTED

It is desirable to boost the efficiency of GCC data centres as far as possible. This will reduce energy and carbon costs and alleviate possible constraints in the delivery of sufficient electricity generating capacity.

Cooling, the main energy efficiency challenge in the GCC, can be addressed by advanced liquid cooling, including direct-to-chip or immersion cooling. This reduces energy demands by 10-20% while adding 7-10% to capital costs. Under current conditions, this appears economically attractive for Dubai, roughly break even for Abu Dhabi, and uneconomic for Saudi Arabia.

A more drastic option is to place data centres underground, which can save from 10-30% of electricity use[XXXVI] because of the cooler subsurface, the reduction in diurnal temperature swings, and the avoidance of solar heat gain. Placing data centres underground limits land use and reduces noise pollution, which may make it easier to place them close to users to limit latency.

This would have the additional advantage in the current conflict of improving robustness to physical attacks such as drones. Burying data centres increases capital costs by about 20% and extends the required building time. Under current conditions, it is probably economically marginal or unfavourable in most of the GCC if considered purely based on energy savings, but it might be desirable for critical functions, or in areas where land is scarce, such as Bahrain.

Other energy-efficient approaches[XXXVII] include:

- replacing old hardware (though this is not yet very applicable in the GCC where most systems are new)
- use more efficient hardware, such as smart power distribution units with 2-3% greater efficiency

- run uninterruptible power systems (UPS) in eco-mode to save 2% of electricity consumption
- containing hot and cold aisles to avoid mixing airflow, reducing fan electricity use by 20-25% and overall energy consumption by 5-10%
- running virtual systems on a single server, and scheduling workflows to times of more abundant electricity
- de-duplicating with software to cut the amount of data stored, potentially by more than 95% at many organisations
- using machine learning tools to manage power and temperature dynamically.

Quantum computing is an emerging technology in the GCC[xxxviii]. It can be significantly more energy-efficient than traditional computing for specific tasks[xxxix]. Many quantum systems require extensive error correction and have to be cooled to near-zero. Overall, it seems likely that progress in quantum computing will lead to an overall rise in demand for its services and hence for electricity, rather than it replacing classical algorithms. However, Saudi Aramco has used quantum computing for optimisation of certain logistical operations, which might therefore save on energy consumption in the wider economy.

The anticipated growth in data centres does present a challenge for regional utilities and gas providers. They have to assess how much of the forecast demand is real. It takes from 18 to 36 months to plan and build a data centre. A major gas-fired power plant or gas-field development takes from 3 to 5 years, especially when considering long lead-times for gas turbines.

If there is a downturn in the AI industry, data centre plans may be cancelled, or their operators may come under financial stress. Therefore, GCC utilities face the risks, on the one hand, of having insufficient power generation and transmission to meet demand, and being accused of holding back a critical national priority, or, on the other hand, over-building infrastructure which is then not used.

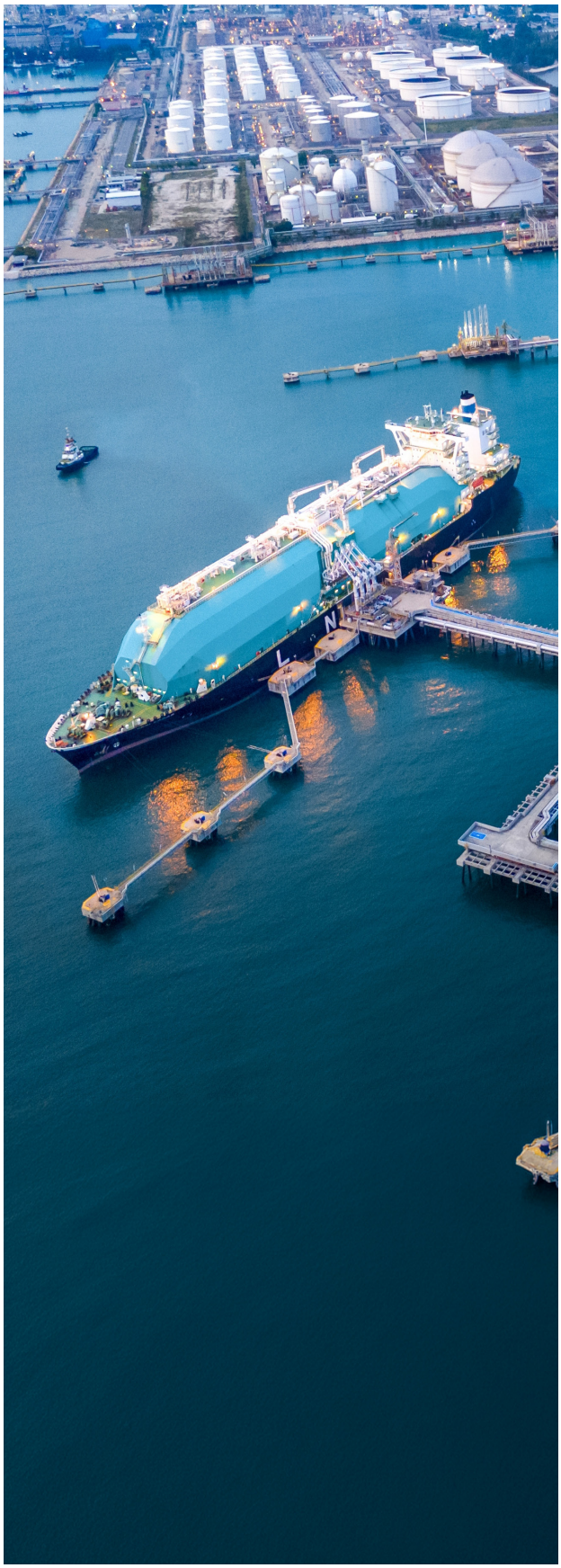
Renewables plus batteries offer a partial solution to this problem. They are more modular, and can be built quickly, on a timescale similar to that for data centres. The GCC countries are anyway trying to replace oil- and gas-fired power with renewables as part of their climate goals. Therefore, it is a lower-risk and "no regrets" strategy to aim to supply most new data centres with renewable electricity.

Nuclear power, conversely, particularly conventional nuclear with lead-times of at least 4 years, is not a good option for the required flexibility.

To the extent that new power generation is fuelled by gas, though, this presents an upstream challenge. Saudi Aramco, ADNOC and QatarEnergy are all engaged in major expansions of gas output to meet a variety of new demand, including power (and data centres), industry and exports. These long lead-time projects cannot easily be accelerated or postponed in response to rapid changes in the gas and electricity demand outlook.

A further uncertainty is how much data centre and AI development will drive wider economic growth. If it becomes a major part of the GCC economy, it will encourage new businesses and more skilled immigration, increasing electricity demand more generally. For instance, a new Saudi data region backed by Microsoft is forecast to create about 100,000 jobs, 30% of which would be skilled technical positions[XL]. Even if most of these go to Saudi nationals rather than expatriates, they will still create downstream demand for energy, services and supporting workers.

Bahrain, Kuwait and Oman have so far had much less data centre development. Oman's power situation is relatively comfortable, and it is developing a large and successful renewables portfolio. For Bahrain, however, limited gas resources and the small amount of land available for renewables would make a major data centre expansion challenging. Kuwait would face similar difficulties because it has outdated power stations, has made limited progress on renewables and imports large quantities of LNG.



DATA CENTRES ALSO IMPROVE ENERGY EFFICIENCY AND FLEXIBILITY

Overall, data centres will almost certainly raise electricity demand. This is particularly true for the GCC if it becomes a global hub, exporting data and AI services elsewhere.

Nevertheless, the appropriate application of AI can boost energy and water efficiency substantially, in both the short and long-term.

Data centres can be a resource for additional flexibility in the grid[XLI]. They can shift up to 10 to 20% of electricity consumption temporarily. At moments of maximum gap between supply and demand, such as the peak air-conditioning load in early evening when solar generation drops off, data centre tasks can be rescheduled[XLII]. This can be achieved with only a small drop-in overall data centre uptime. Thermal storage can include storing chilled water or ice for cooling in high-demand periods. Such approaches can be incentivised by dynamic or at least time-of-day electricity pricing. At the moment, most GCC states do not have such pricing approaches.

AI can also facilitate the creation and deployment of new energy systems to meet the required demand, and to limit the environmental impact. These are complex and detailed topics in themselves, with multiple feedback loops. These include the "Jevons Paradox", where greater energy efficiency allows higher economic growth, which in turn raises energy consumption. Indicative areas where AI could lead to breakthroughs include:

- Logistical optimisation, reducing transport energy intensity
- Management of airline routes to minimise contrail formation
- Dynamic optimisation of heating, cooling and air-conditioning (HVAC) systems and electric motors
- Automated control of electrical grids, including dynamic line rating, and incorporation of advanced weather forecasting, especially important with the growing share of renewables
- AI-based searches for new oil and gas resources
- Development of new materials, such as carbon capture sponges, superconductors, highly efficient solar panels (e.g. with perovskites), and lightweight or highly insulating materials for buildings, vehicles and space
- Invention of batteries with desirable combinations of longer cycle lives, higher energy density, faster recharging, greater safety, lower cost, and less use of scarce minerals
- Design and testing of novel nuclear fission and fusion reactors

17 GCC COUNTRIES HAVE BECOME CRUCIAL GLOBAL INVESTORS IN AI

The strategic imperative to expand the GCC's AI capabilities has encouraged major investments outside the region. The motives here include accessing a fast-growing sector with the chance for major financial returns; leveraging political relations, particularly with the US; gaining access to advanced technology that can then be deployed in the GCC; and building links to the main international tech firms who will then develop GCC-based projects.

These partnerships do not drive GCC energy demand directly, but they can support it indirectly by facilitating wider economic growth in the Gulf. To the extent that GCC capital allows the data centre industry to expand more quickly, in the US or elsewhere, than it would otherwise have done, it also boosts global energy use. These international ventures have also raised GCC awareness of some of the energy options being pursued elsewhere for data centres, notably the use of small modular nuclear reactors (SMRs). Bahrain, the UAE and Saudi Arabia have all expressed interest in SMRs.

Notable recent ventures include:

- March 2025: MGX and Silver Lake became minority investors in Dubai-based Khazna, taking the stake from state telecommunications company e& (formerly Etisalat), alongside the majority shareholder G42[XLIII]. Khazna has 650 MW of data centre capacity, with plans to add 1 GW by 2030 across the UAE, Saudi Arabia, Italy and other locations[XLIV]
- September 2025: QIA partnered with Blue Owl Capital for a $3 billion data centre venture[XLV]
- September 2025: MGX invested with Silver Lake to buy 51% of Altera at a valuation of $8.75 billion, a company making programmable chips, from Intel[XLVI]
- December 2025: Qai formed a $20 billion joint venture with Brookfield to invest in AI infrastructure in Qatar and internationally[XLVII]
- September 2025, February 2026, May 2026: QIA participated in Anthropic's $13 billion, $30 billion and $65 billion funding rounds[XLVIII]
- February 2026: HUMAIN invested $3 billion in the xAI startup founded by Elon Musk, which was then merged into SpaceX[XLIX]
- June 2026: MGX teamed up with Bpifrance and Mistral to develop up to 3 GW of data centres in France[L]
- July 2026: MGX from Abu Dhabi, backed by Mubadala and G42, and chaired by Sheikh Tahnoon bin Zayed Al Nahyan, raised $49 billion for AI investments, one of the largest commitments worldwide
- July 2026: A consortium including MGX with BlackRock intended to invest $5 billion to expand Aligned Data Centres, an operator throughout the US and South America
- September 2026: HUMAIN plans to launch a venture capital fund, potentially larger than $10 billion, which will back companies seeking to use Saudi data centres or bring personnel to Saudi Arabia[LI]

GCC countries must be aware of the energy, water and climate impacts of their international projects and investments. Opposition to data centre construction in the US has coalesced around concerns for rising local electricity rates, water consumption, noise pollution and other environmental damage.

As foreign companies, GCC investors could face even more opposition to their plans than US corporations. One partial solution could be to leverage the GCC's strengths as an energy producer and investor, committing to build sufficient generation capacity to meet demand and possibly to lower energy costs for consumers in data centre locales, rather than raising them. So far, though, MGX has specifically avoided investing in energy providers to data centres.

CONCLUSION

Three of the six GCC countries – Qatar, Saudi Arabia and the UAE – have major data centre and AI programmes, both at home and abroad. The boost to their electricity demand, of the order of 10-20% of current installed capacity by the early 2030s, is sizeable but manageable.

One of the greatest attractions for the GCC countries as a site for data centres is their ability to provide cheap, abundant and low-carbon or zero-carbon electricity. To sustain this advantage, they must:

- continue the rapid expansion of solar, wind and battery capacity
- secure adequate gas-fired backup, including long lead-time items such as turbines, and the upstream supply
- maximise energy efficiency of data centres, with use of new technologies, and attention to the optimal balance of capital costs versus energy savings
- integrate data centres into their overall energy planning, maximising the benefits of flexibility, and ensuring build-out of generation and transmission is reasonably synchronised with data centre construction
- adapt their power markets to encourage intelligent use of electricity and timing
- leverage the ability of AI to develop new energy tools and solutions
- integrate energy and water considerations when planning their international data centre investments.

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May - 2026

Gulf and US Investments in Global Critical Metals and Minerals

Gulf states are accelerating global investments in critical metals and minerals, focusing on securing long-term supply for industries linked to clean energy and advanced manufacturing. The US has sought to build partnerships with the GCC for these materials.

(QRCODE)

March - 2026

US–Gulf Nuclear Cooperation: Energy and Security

Three of the six Gulf Cooperation Council (GCC) countries are actively developing civil nuclear power programmes. Growing demand for electricity and desalination, ample financial resources, and political systems capable of delivering large-scale projects on time and within budget support this expansion.

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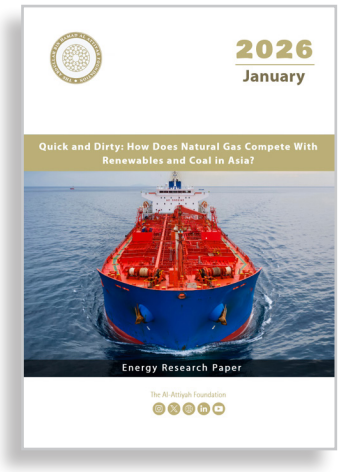

January - 2026

Quick and Dirty: How Does Natural Gas Compete With Renewables and Coal in Asia?

Faced with relatively expensive natural gas imports, many Asian countries have turned to a combination of renewables and coal. This delivers reliable electricity at reasonable costs with some reduction in greenhouse gases and other pollutants.

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Our partners collaborate with The Al-Attiyah Foundation on various projects and research within the themes of energy and sustainable development.

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