



# What Saudi AI Must Earn To Justify Its Gas



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# Executive summary

Every megawatt-hour of electricity a Saudi AI data center uses, at the official cloud-computing rate, gives up oil worth more than twice what the electricity earns. The cost never appears on the power bill, because it is oil that is not exported rather than money paid out.

The reason lies in how the Kingdom plans to use its gas. Saudi Arabia is replacing the crude and fuel oil burned in its power plants with gas, so that the oil saved can be sold abroad.

Aramco expects its new gas program, led by the Jafurah field, to free about 500,000 barrels a day this way once it reaches full production.

A data center adds new demand for electricity. If gas is used to meet that demand, it is not replacing oil, and the oil-burning plants keep running.

The trade-off can be measured. Making one megawatt-hour of electricity takes gas holding about as much energy as one barrel of oil.

So each megawatt-hour a data center uses keeps about one barrel at home. At \$108, the average price Aramco received for its crude in the second quarter, that barrel is worth more than twice the \$48 the electricity earns at the official rate of 18 halalah per kilowatt-hour. To match the oil's value, the rate would have to rise to about 40 halalah.

We use the official rate because HUMAIN's own price has not been published. It is also unclear which rate applies to data centers connected after 2023: the 2021 rate covered only earlier connections, and we found no published replacement.

The cost rises when gas runs short. The extra electricity then comes from plants that burn oil and need more of it, up to 1.8 barrels per megawatt-hour, worth up to \$193. The 2026 Hormuz closure showed how quickly this can happen. By the second quarter, Aramco's gas output had fallen by about three times what HUMAIN's planned 1.9 gigawatts would need. Much of the extra fuel burned that year was imported, which cost the Kingdom cash rather than exports.

The amounts are material. HUMAIN, the AI company owned by the Public Investment Fund, has the largest plans of any Saudi operator: 1.9 gigawatts by 2030 and 6.6 gigawatts by 2034, according to its chief executive.

Running full time on gas-fired power, 1.9 gigawatts would use gas able to free 45,000–49,000 barrels a day, about a tenth of what Aramco expects its new gas to free. At 6.6 gigawatts, the share rises to about a third. His latest interview points to about 3 gigawatts by 2030, which would lift the 2030 share to about 15%. These totals cover HUMAIN alone, and other operators would add to them. The cost per megawatt-hour does not depend on how much is built.

For policymakers, the test is therefore value per megawatt-hour, not gigawatts built. AI has to create at least about \$110 of value for every megawatt-hour it uses before paying for power. The electricity bill covers \$48.

The remaining \$58–68 has to come from what is built on the computing power. The price the state sets for power to new data centers will show whether it intends to absorb that gap as support for the sector or charge it to the operators. Aramco's third-quarter results, due in early November, will show whether its gas output has recovered.

## Editorial Note

We publish without bylines. Our research is produced collectively — analysts, editors and data specialists working on the same questions — and the findings reflect the judgement of the team rather than of any individual.

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# Two measures, one answer each

If 1.9 gigawatts of data centers ran at full power all year, they would use about 16.6 terawatt-hours of electricity (1.9 gigawatts × 8,760 hours in a year).

Modern gas-fired power plants turn 55–60% of the energy in gas into electricity. At that rate, producing 16.6 terawatt-hours would take about 0.27 billion cubic feet of gas a day, or 0.25–0.28 depending on the plant.

That is 2.6–2.9 billion cubic meters a year: a little over

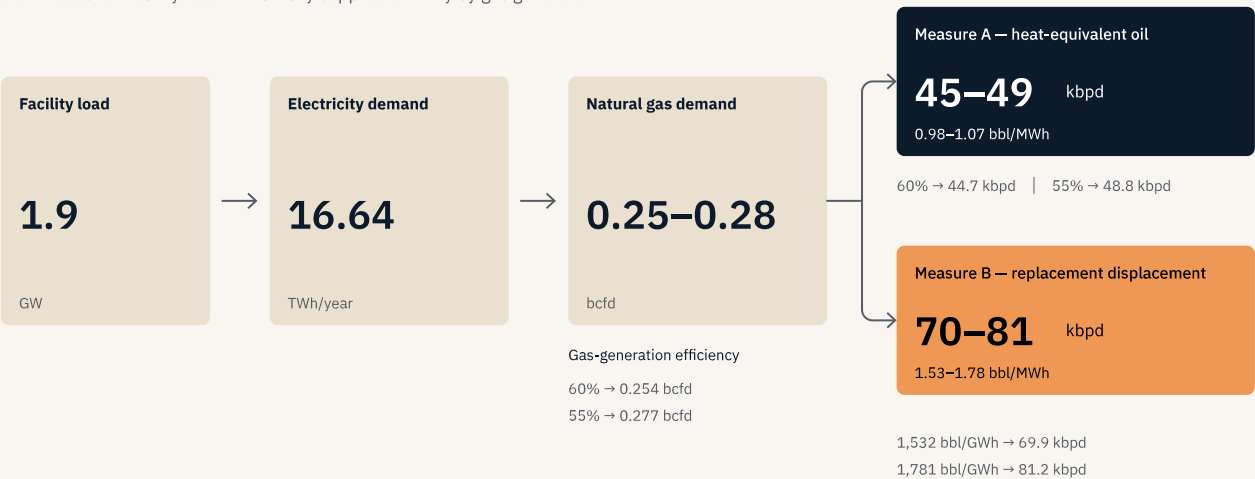
2% of the gas Saudi Arabia produced in 2025, and about as much as the first phase of the Jafurah gas field, which started production in December 2025, can produce in a year. In effect, the Kingdom’s first 1.9 gigawatts of AI would use all the gas from Jafurah’s first phase.

How many barrels of oil that gas represents depends on what it would otherwise have been used for. So we measure it in two ways and keep them separate (Figure 1 and Table 1).

Figure 01 | Energy requirement

## From 1.9 GW of compute to barrels: two measures

Continuous full facility load • Electricity supplied entirely by gas generation



Measure A is the fuel-switch floor; Measure B is the replacement-displacement ceiling.

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Measure A: gas heat (1,020 Btu/scf) ÷ crude heat (5.8 MMBtu/bbl). Measure B: electricity ÷ oil-plant efficiency (33–38%, implied by Anwer and Matar (2017) heat rates of 1,781–1,532 bbl/GWh) ÷ 5.8 MMBtu/bbl. Assumptions: 100% load factor; 365 days/year; gas-generation efficiency 55–60%. Figures rounded. Source: Argaam Intelligence calculations; Anwer and Matar (2017).



## Measure A

### The energy swap (our headline)

This asks how much oil holds the same energy as the gas. Each day, 0.27 billion cubic feet of gas holds about as much energy as 47,500 barrels of crude, or 44,700–48,800 depending on plant efficiency.

That works out at about one barrel (0.98–1.07) for every megawatt-hour of electricity. It assumes the gas would have replaced oil in plants that can burn either fuel equally well, such as existing dual-fuel steam plants. It needs no assumption about which plants would close, which is why it is our headline.

## Measure B

### Replacing oil-fired plants (the upper case)

This asks how much oil the gas would have saved if, instead of powering data centers, it had run modern gas plants that took over the work of oil-fired ones.

Oil-fired plants are less efficient, so they need more oil to make the same electricity. A KAPSARC study of Saudi plants in 2015 found they burned 1,532–1,781 barrels per gigawatt-hour, depending on plant type, turning only 33–38% of the oil's energy into electricity. On that basis, the gas behind each megawatt-hour would have saved 1.53–1.78 barrels, or 70,000–81,000 barrels a day for 1.9 gigawatts. That is 1.4–1.7 times Measure A. It holds only if the gas really would have shut down oil-fired generation, so we treat it as an upper case.



Table 01

## From 0.27 bcfd to barrels

|                                                                             | Measure A:<br>heat-equivalent oil                                                             | Measure B:<br>replacement displacement                                                      |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Counterfactual for the gas</b>                                           | Gas replaces oil as a fuel at equal conversion efficiency (existing steam or dual-fuel units) | A gas-fired combined-cycle plant retires oil-fired generation of the same electricity       |
| <b>Electricity</b>                                                          | 16.64 TWh a year (1.9 GW × 8,760 hours)                                                       | Same                                                                                        |
| <b>Gas needed</b>                                                           | 0.25–0.28 bcfd (2.6–2.9 bcm a year) at 60–55% efficiency; 0.27 at the midpoint                | Same gas, sized to the same electricity                                                     |
| <b>Conversion to barrels</b>                                                | Gas heat (1,020 Btu/scf) ÷ crude heat (5.8 MMBtu/bbl): 0.27 bcfd gives 47.5 kbpd              | Electricity ÷ oil-plant efficiency (33–38%, implied by 1,781–1,532 bbl/GWh) ÷ 5.8 MMBtu/bbl |
| <b>Barrels per MWh</b>                                                      | 0.98–1.07                                                                                     | 1.53–1.78                                                                                   |
| <b>Oil, 1.9 GW (2030 base case)</b>                                         | 44.7–48.8 kbpd                                                                                | 69.9–81.2 kbpd                                                                              |
| <b>Share of Aramco's 500 kbpd</b>                                           | 9–10%                                                                                         | 14–16%                                                                                      |
| <b>Share of Rystad's 350 kbpd (third-party estimate)</b>                    | 13–14%                                                                                        | 20–23%                                                                                      |
| <b>Oil, 6.6 GW (2034 base case)</b>                                         | 155–169 kbpd (31–34% of 500)                                                                  | 243–282 kbpd (49–56% of 500)                                                                |
| <b>Sensitivity: ~3 GW (2030) and 6 GW (2034), September 2026 trajectory</b> | 71–77 kbpd (14–15%) and 141–154 kbpd (28–31%)                                                 | 110–128 kbpd (22–26%) and 221–256 kbpd (44–51%)                                             |

Source: Argaam Intelligence calculations; Anwer and Matar (2017); Saudi Aramco (n.d.); Rystad Energy (2025); EnterpriseAM (2026) for the sensitivity. Model: Gas\_to\_Barrels and Capacity\_Test sheets.

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# A larger AI footprint, A larger claim on Aramco's gas

HUMAIN's plans are large enough to take a sizeable share of the oil Aramco expects its new gas to free.

Against Aramco's figure of 500,000 barrels a day, HUMAIN's plan for 1.9 gigawatts by 2030 would use gas worth 45,000–49,000 barrels a day on Measure A, 9–10% of that figure. On Measure B, the upper case, it would be 70,000–81,000 barrels a day, or 14–16%.

The comparison comes with a caveat, because Aramco hasn't said how it calculated its 500,000. Its goal of producing 2 billion cubic feet of gas a day from Jafurah by 2030 holds the energy of about 350,000 barrels of oil a day, almost exactly the figure the research firm Rystad Energy gives.

Our reading, which Aramco has not confirmed, is that Rystad simply converts gas into oil by energy content, as our Measure A does. Aramco's larger figure may allow for gas replacing less efficient oil plants, closer to our Measure B, or may include gas from fields other than Jafurah. Measured

against Rystad's 350,000, the shares are higher: 13–14% on Measure A and 20–23% on Measure B.

The share grows with HUMAIN's plans (Figure 2). At its 2034 target of 6.6 gigawatts, the gas would be worth 155,000–169,000 barrels a day on Measure A, about a third of Aramco's 500,000 (31–34%).

On Measure B it would be 243,000–282,000, about half (49–56%). At that size, AI is no longer a small source of electricity demand. HUMAIN's latest interview points to about 3 gigawatts by 2030 and 6 gigawatts by 2034. On that path, the 2030 shares rise to 14–15% on Measure A and 22–26% on Measure B, and the 2034 shares are 28–31% and 44–51%. The newer plan mainly brings the demand forward.

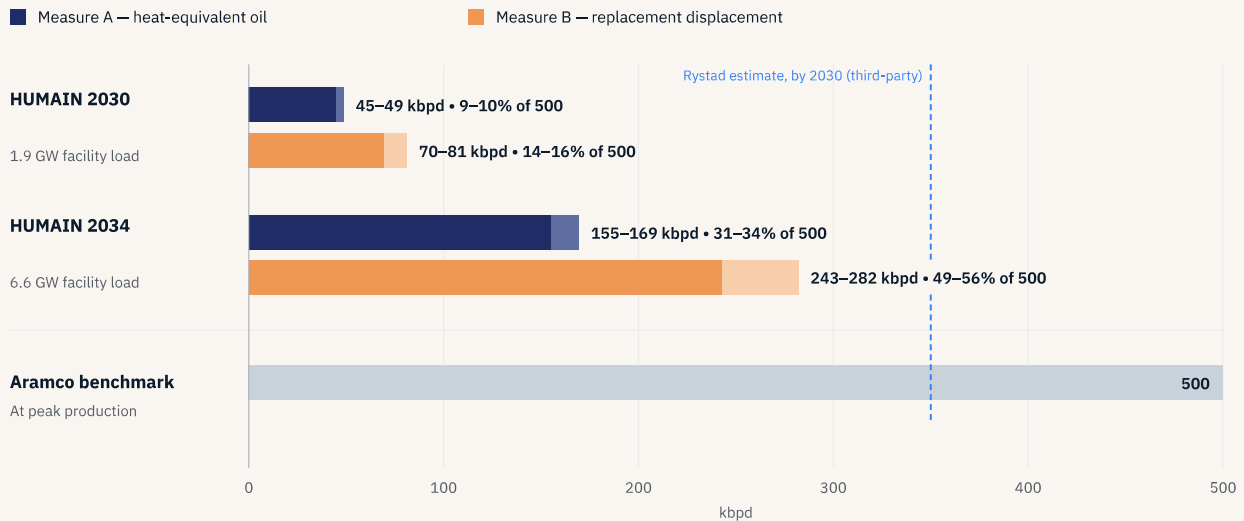
These figures cover HUMAIN only. Every other large data-center campus announced in the Kingdom would draw on the same gas, so the national total will be higher.



Figure 02 | Capacity and scale

## A larger AI footprint, a larger energy claim

Oil requirement of HUMAIN's capacity targets against Aramco's 500 kbpd displacement benchmark, by measure



Scale comparison only: neither measure is Aramco's own displacement accounting.

Source: Argaam Intelligence calculations; Saudi Aramco (n.d.); Gray (2022); Rystad Energy (2025).

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### Assumptions

- › continuous full facility load; gas-generation efficiency 55–60% (Measure A); oil-fired heat rates 1,532–1,781 bbl/GWh (Measure B); crude 5.8 MMBtu/bbl. HUMAIN capacity targets are from CEO interviews, not a company release; the September 2026 interview gives roughly 3 GW by 2030 and 6 GW by 2034 (see Table 1).
- › Aramco publishes no method for the 500 kbpd. The 350 kbpd figure is a Rystad Energy estimate shown for reference only.



# The tariff pays for less than half the barrel

If the gas behind each megawatt-hour could have earned export income, the next question is whether the price paid for that electricity reflects it.

We compare it with Saudi Arabia's official electricity rate for cloud-computing data centers: 18 halalah per kilowatt-hour, or \$48 per megawatt-hour.

The Council of Ministers set this rate in 2021 as an incentive. It covered licensed operators already running and new ones that applied for a connection before the end of 2023.

Among other conditions, electricity had to make up more than 20% of their operating costs, and they had to draw power steadily, at an annual load factor of at least 80%. The rate is fixed for seven years.

We use this rate as a reference, not as HUMAIN's actual price, which has not been disclosed. HUMAIN was launched in 2025, after the deadline, and we found no decision extending the rate to later connections. The regulator's current tariff schedule still lists 18 halalah for cloud computing.

It also lists a separate rate of 12 halalah for eligible heavy users connected to the high-voltage transmission grid. A KAPSARC study in December 2025 said the price data centers will pay had yet to be decided.

The Financial Times reported in May 2025 that the government would subsidize HUMAIN's electricity, without giving a rate. At 18 halalah, 1.9 gigawatts running all year would pay about SAR 3.0 billion (\$0.80 billion) a year for electricity.

On the other side of the comparison, we value each barrel at the average price Aramco received for its crude, not at Brent, because it is what Aramco actually earned per barrel sold. It was \$108.1 in the second quarter of 2026, our main case, and \$90.1 for the first half, our low case. Aramco's third-quarter results are not yet out.

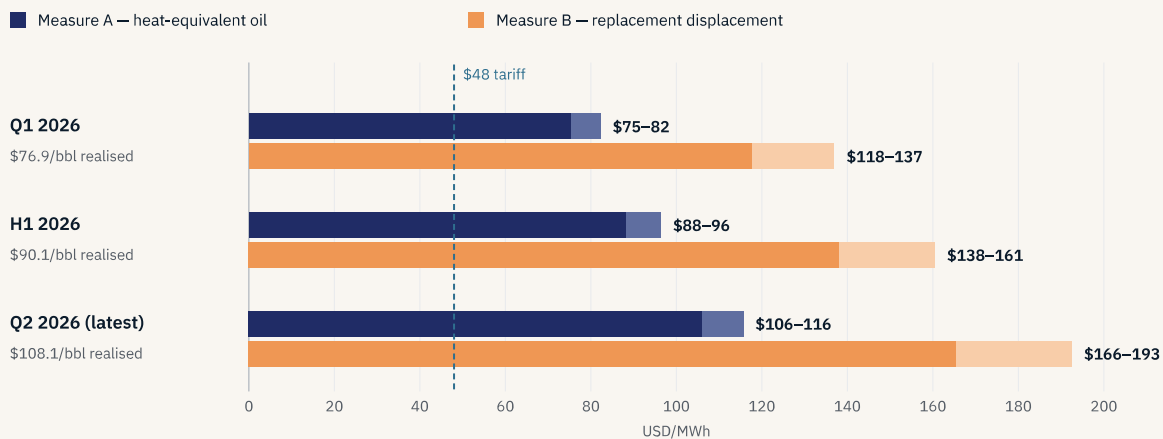
The figure is an average across all grades and destinations, so it does not show exactly what the next barrel exported would earn after shipping costs. The second-quarter price was unusually high, but the market has since returned to that level: Brent averaged \$114 in September and stood at \$115 on 20 October.



Figure 03 | Oil value and electricity tariff

## At realized prices, the tariff covers 25–64% of the oil behind each MWh

Value of the oil behind one MWh at Aramco's average realised crude price, versus the \$48/MWh cloud-computing tariff



|                                            | Q1 2026 | H1 2026 | Q2 2026 |
|--------------------------------------------|---------|---------|---------|
| Tariff recovery, Measure A                 | 58–64%  | 50–54%  | 41–45%  |
| Tariff recovery, Measure B                 | 35–41%  | 30–35%  | 25–29%  |
| Break-even tariff, Measure A (halalah/kWh) | 28–31   | 33–36   | 40–43   |
| Break-even tariff, Measure B (halalah/kWh) | 44–51   | 52–60   | 62–72   |

Realised price is already a netback; no Brent ratio is applied.

Source: Argaam Intelligence calculations; Saudi Aramco (2026); Umm Al-Qura (2021a).

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- › Ranges reflect 55–60% gas-generation efficiency (Measure A) and 1,532–1,781 bbl/GWh oil-fired heat rates (Measure B). Tariff: 18 halalah/kWh at SAR 3.75/USD; a reference rate, not HUMAIN's contracted price.
- › Aramco's realized price averages all grades and routes and is not a freight-adjusted spot netback; Q2 2026 was a quarter of unusually high prices. Source: Argaam Intelligence calculations; Saudi Aramco (2026); Umm Al-Qura (2021a).



At Aramco’s second-quarter price, the oil behind one megawatt-hour is worth \$106–116 on Measure A and \$166–193 on Measure B. The data center pays \$48 for that electricity (Figure 3 and Table 2). So the electricity price covers 41–45% of the oil’s value on Measure A, and 25–29% on Measure B.

For the electricity to earn as much as the oil, the rate would have to rise from 18 halalah per kilowatt-hour to 40–43 on Measure A, or 62–72 on Measure B. At the lower first-half price of \$90.1 a barrel, it would need to be 33–36 or

52–60. Every \$10 rise in the oil price adds about \$10 to the oil’s value per megawatt-hour, and about 4 halalah to the rate needed to match it.

Over a year, 1.9 gigawatts running full time would use gas whose oil equivalent is worth \$1.8–1.9 billion on Measure A and \$2.8–3.2 billion on Measure B. The data centers would pay about \$0.8 billion for their electricity. At 6.6 gigawatts, the oil would be worth \$6.1–6.7 billion on Measure A and \$9.6–11.1 billion on Measure B, against about \$2.8 billion in electricity payments.

Table 02

Realized value, tariff recovery and break-even tariff by price case

| Price case<br>(Aramco realized) | A                 |                    |                             | B                 |                    |                             |
|---------------------------------|-------------------|--------------------|-----------------------------|-------------------|--------------------|-----------------------------|
|                                 | value<br>(\$/MWh) | tariff<br>recovery | break-even<br>(halalah/kWh) | value<br>(\$/MWh) | tariff<br>recovery | break-even<br>(halalah/kWh) |
| Q2 2026: \$108.1<br>(latest)    | 106–116           | 41–45%             | 40–43                       | 166–193           | 25–29%             | 62–72                       |
| H1 2026: \$90.1                 | 88–96             | 50–54%             | 33–36                       | 138–160           | 30–35%             | 52–60                       |
| Q1 2026: \$76.9                 | 75–82             | 58–64%             | 28–31                       | 118–137           | 35–41%             | 44–51                       |

Source: Argaam Intelligence calculations. Model: Price\_Netback sheet



- › Ranges span gas efficiency of 55–60% (Measure A) and heat rates of 1,532–1,781 bbl/GWh (Measure B).
- › Price cases: Aramco average realized crude price, Q2 2026 (\$108.1), H1 2026 (\$90.1) and Q1 2026 (\$76.9) (Saudi Aramco, 2026).
- › Tariff \$48/MWh (18 halalah/kWh at SAR 3.75/USD).



# The barrel cost is not fixed

## The barrel cost changes with the seasons and with gas supply

The figures so far assume conditions stay the same all year. They don't. A data center draws the same power day and night, all year round, but Saudi electricity demand swings sharply between winter and summer. And in 2026, the gas supply proved exposed to events outside the Kingdom's control.

### Summer: steady demand meets a seasonal peak

Saudi electricity demand rises by about three-quarters in summer, mainly for air conditioning. The latest published figures, for 2015, show average demand of 28.3 gigawatts in winter and 49.8 in summer.

We treat the 21.5 gigawatt difference as cooling demand: 43% of summer demand. Peak demand shows the same pattern, at 62.3 gigawatts in summer against 34.3 in winter. A data center running 1.9 gigawatts all year would add the equivalent of about 9% of that extra summer demand on average, and about 7% at the peak.

Demand has grown since 2015. Peak demand reached a record 77.1 gigawatts in 2025, so 1.9 gigawatts is about 2.5% of today's peak and 6.6 gigawatts about 8.6%.

We use 2015 for the seasonal comparison because no later winter figures have been published. The monthly series used for such estimates ended in 2019.

Put another way, on the 2015 relationship between temperature and demand, 1.9 gigawatts adds as much demand as a 1.6°C rise in temperature, and 6.6 gigawatts as much as 5.6°C.

This compares demand, not warming. Data centers also need more cooling in hot weather, so their demand peaks when the grid's does.

The oil burned for power follows the same seasonal pattern (Figure 4). Crude burned directly, mostly in power plants, rose from 308,000 barrels a day in January 2024 to 814,000 in August, then fell to 279,000 in December.

In 2025 it peaked at 675,000 in June and fell to 210,000 in December, the lowest in the series. In 2026 it peaked at 648,000 in May and was 561,000 in July. April and May 2026 were about 160,000 barrels a day higher than a year earlier, while June and July were lower.

Against that, a steady 1.9 gigawatt load equals about 6% of crude burn at the August 2024 peak on Measure A (10% on Measure B). At the December 2025 low, it equals about 23% (39% on Measure B).

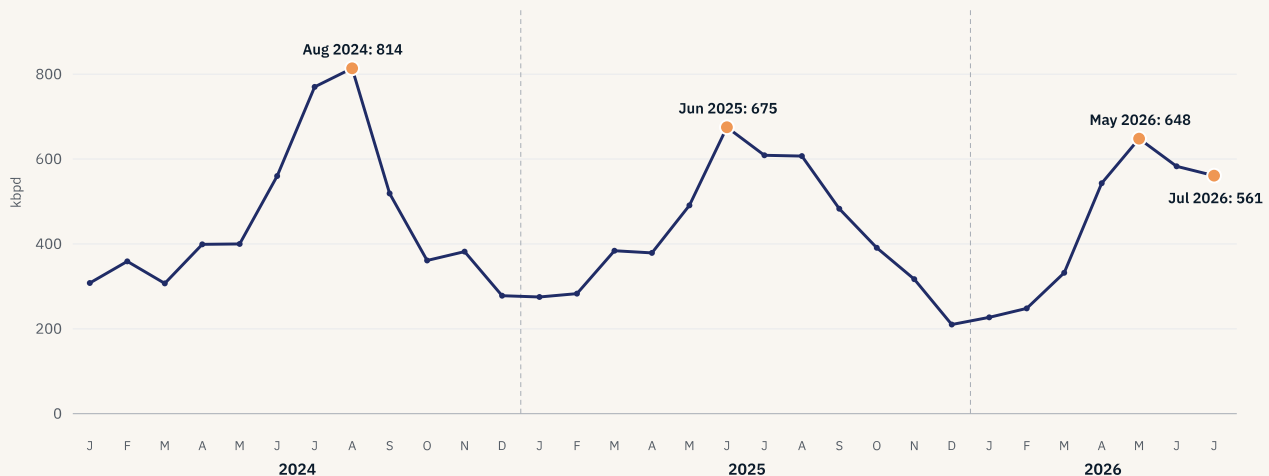
Crude is only part of the oil burned. According to MEES, power plants also burned about 586,000 barrels a day of fuel oil in July 2026, for a total of about 1.15 million barrels a day, the lowest July since 2019. The fuel-oil figure has not been confirmed in an official source. Without official monthly figures for fuel oil and for electricity generation by fuel, we cannot compare the AI load with total oil burn month by month.



Figure 04 | Monthly crude oil direct use

## Summer pressure recurs, but crude use fluctuates

Saudi Arabia • January 2024–July 2026 • Thousand barrels per day (kbpd)



Note: Crude oil direct use; excludes fuel oil and gasoil. Monthly average rates.  
Source: JODI-Oil World Database; data through July 2026. Chart: Argaam Intelligence.

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## Shut-ins: the 2026 Hormuz test

Gas supply is the other factor that can change the cost, and the 2026 Hormuz closure put it to the test. With the strait almost closed, Saudi Arabia cut oil production as storage filled, and press reports in early March said the offshore Safaniya and Zuluf fields had been shut. In April, the energy ministry said attacks had cut flows on the East-West pipeline by 700,000 barrels a day and production capacity at the Manifa and Khurais fields by 600,000. Three days later, it said the pipeline was back at about 7 million barrels a day. We use these reports as background only. Our production figures come from Aramco and JODI.

When oil fields shut, the gas produced alongside the oil stops too. The IEA said operators had not disclosed how much gas was lost, but named Safaniya, Manifa, Zuluf and Marjan among the affected fields. Together, those fields normally produce about 0.48 billion cubic feet of gas a day.

Aramco's own reports now show the scale. Its total gas production fell from 10.74 billion cubic feet a day in the

last quarter of 2025 to 10.51 in the first quarter of 2026, which included only about four weeks of the closure, and to 9.92 in the second quarter.

That is a fall of 0.82 billion cubic feet a day, 7.6% below the end-2025 level and 16% below a year earlier. In the second quarter, crude output averaged 3.38 million barrels a day less than at the end of 2025.

That works out at about 242 cubic feet of gas lost for every barrel of crude not produced. The new Jafurah field's early output offset part of the fall, so the gas lost from oil fields was larger still.

Two things stand out. The gas lost by the second quarter is about three times what HUMAIN's 1.9 gigawatts would need. And it is well above the IEA's 0.48 billion cubic feet a day for the four named fields, which suggests other fields were affected too. Table 3 sets this loss alongside estimates from first-quarter data and two cases of deeper cuts.



Table 03

### Gas lost with the Q2 2026 crude cut, and the oil burn it could force

| Case                                   | Basis                                                                | Gas lost (bcfd) | Multiple of 1.9 GW gas demand | Extra oil burn, Measure A (kbpd) | Extra oil burn, Measure B (kbpd) |
|----------------------------------------|----------------------------------------------------------------------|-----------------|-------------------------------|----------------------------------|----------------------------------|
| <b>Observed, Q2 2026 vs Q4 2025</b>    | Aramco total gas production; implies 242 scf per barrel of crude cut | 0.82            | 2.9×                          | 72                               | 120                              |
| <b>Q1-implied ratio, March basis</b>   | 219 scf/bbl applied to the Q2 cut                                    | 0.74            | 2.7×                          | 65                               | 109                              |
| <b>Q1-implied ratio, quarter basis</b> | 288 scf/bbl applied to the Q2 cut                                    | 0.97            | 3.5×                          | 86                               | 143                              |
| <b>Stress case</b>                     | 500 scf/bbl                                                          | 1.69            | 6.1×                          | 149                              | 248                              |
| <b>Stress case</b>                     | 1,000 scf/bbl                                                        | 3.38            | 12.2×                         | 297                              | 495                              |

Source: Argaam Intelligence calculations, based on Aramco and JODI data.

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#### Note

- › The second-quarter crude cut is 3.38 million barrels a day below the end-2025 level. The observed row uses Aramco's reported gas production. The ratio rows apply the gas lost per barrel in the first quarter to the second-quarter cut.
- › The stress cases are illustrations. Extra oil burn assumes, for illustration, that half of the gas shortfall falls on power plants and that no new gas makes up for it.
- › Measure B adjusts Measure A for plant efficiency: 55% for gas and 33% for oil. Part of the extra fuel in 2026 was imported fuel oil, about 360,000 barrels a day in April according to tanker-tracking estimates, so some of the extra burn cost cash rather than exports.
- › This is not used in the figures. For comparison, crude burned in the second quarter of 2026 was 78,000 barrels a day higher than a year earlier, and 161,000 higher in April and May. Those figures also reflect weather and demand growth.

For a data center, this changes the cost of each megawatt-hour. When there is enough gas, the cost is the oil the gas could have replaced: about one barrel per megawatt-hour on Measure A, and up to 1.5–1.8 on Measure B.

When gas runs short, the extra electricity comes from oil-fired plants, and each megawatt-hour the data center uses burns 1.5–1.8 barrels directly. A gas shortage therefore

pushes the cost from the lower measure towards the higher one, up to about 1.8 times as much.

Saudi Arabia moved in that direction in 2026, just as oil prices reached their highest: Brent averaged \$117 in April. How much crude the Kingdom produces decides how much gas is available. Which plants meet the extra demand decides the cost in barrels.



# What it would take to carry the load through the night

Solar power and batteries can reduce this exposure, but data centers keep running after sunset. Carrying a steady 1.9 gigawatt load through 14 hours without sunlight would take 26.6 gigawatt-hours of stored electricity.

That means about 31 gigawatt-hours of battery capacity, allowing for the fact that only 90% of a battery's capacity is usable and 5% is lost when it discharges.

That is large against what Saudi Arabia has built. Saudi Energy, the national utility, had 18 gigawatt-hours of batteries in operation by mid-2026, up from 8 three months earlier, against its 2026 target of 22.

The overnight need of 1.9 gigawatts is 1.5 times that, or 1.7 times in battery-capacity terms. It is also about 55% of the national target of 48 gigawatt-hours for 2030, or 65% in battery-capacity terms.

Building continues. The energy ministry reportedly said seven battery projects of 2 gigawatt-hours each were commissioned in 2026.

The Saudi Power Procurement Company awarded another 8 gigawatt-hours in August and opened bidding for 12 more in April. These figures overlap, so they cannot be added into a single national total.

That makes flexibility valuable to a data-center operator. Computing work that can be shifted to sunny hours is less exposed to summer peaks and gas shortages. The cost in barrels of the next megawatt-hour depends on the hour it is used, the plant that supplies it, and whether extra gas is available.



# What would change the answer, and the signals to track

**Two unknowns about HUMAIN's plans could change the totals considerably.**

**01. How hard the data centers run.**

We assume full power all year. At 80%, the minimum the cloud-computing rate requires, electricity use falls from 16.6 to 13.3 terawatt-hours a year. The oil involved falls to 36,000–39,000 barrels a day on Measure A, or 56,000–65,000 on Measure B.

**02. What the 1.9 gigawatts measures.**

HUMAIN hasn't said whether the figure covers the computing equipment alone or the whole facility, including cooling. We assume the whole facility. If it covers the equipment alone, the whole facility would need about 2.7 gigawatts. That is based on the efficiency standard the National Infrastructure Fund sets for the data centers it finances: a power usage effectiveness of 1.4. The oil involved would then rise to 63,000–68,000 barrels a day on Measure A, or 98,000–114,000 on Measure B.

Both change the size of the load. How costly that load is for the energy system depends on three signals that can be tracked from published data (Table 4).

The domestic fuel balance. More gas does not mean less oil burned if new demand uses up the extra gas. The test is whether the oil burned at home, especially in summer, falls as gas output grows. The starting point is July 2026: 561,000 barrels a day of crude burned, and about 1.15

million including fuel oil, according to MEES. If summer oil burning stays high as gas output and AI capacity grow, the oil savings are arriving more slowly than gas growth suggests. A steady fall would show the opposite.

Where the data centers' electricity comes from. A gigawatt powered by existing gas plants costs more in oil than one powered by new solar, batteries or imported electricity. So how each project is powered tells us more than its size. HUMAIN's first campuses will draw on the national grid. In September 2026, the national transmission company signed a connection agreement for a HUMAIN project east of Riyadh, without disclosing its size or price. The new Saudi–Egypt power link, able to carry 3 gigawatts, could help, because the two countries' demand peaks at different times. According to press reports, it is in trial operation and due to start officially in mid-November 2026. But its capacity is shared and flows vary, so it cannot be counted as dedicated to AI. What matters is whether imports are available when Saudi demand is highest.

The price. The 18 halalah rate is fixed for seven years, requires steady use, and in its 2021 form covered only facilities that applied to connect by the end of 2023. Whether HUMAIN pays that rate, a new one or a negotiated price is the first thing to watch. Against a break-even of 40–43 halalah on Measure A, any change alters how much of the oil's value the electricity earns. If the rate stays fixed while oil prices rise, the gap widens. A data-center campus also outlasts a seven-year fixed rate, so operators face the risk of higher prices later.



Table 04

## Signals to track, and what each would show

| Signal                                                          | Source and frequency                                                                                    | What it would show                                                                                                                                               |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tariff applied to data-center loads connected after 2023</b> | Council of Ministers decisions (Umm Al-Qura); WERA; utility disclosures                                 | Whether the power sale recovers more than 41–45% of the oil behind each MWh (Measure A, Q2 2026 price); a repricing risk for campuses on a seven-year fixed rate |
| <b>Crude direct use and fuel-oil burn, summer months</b>        | JODI monthly (crude), with product tables for fuel oil; MEES                                            | Whether gas growth is displacing liquid fuel or being absorbed by new load                                                                                       |
| <b>Aramco total gas production, Q3 2026 onward</b>              | Aramco quarterly interim reports (Q3 2026 due in early November)                                        | Recovery from the 9,921 mmscfd Q2 2026 trough; Jafurah ramp-up towards two billion scfd of sales gas by 2030                                                     |
| <b>Power-sourcing of each announced gigawatt</b>                | Developer and utility announcements; grid-connection and power-purchase agreements; NIF financing terms | Share of AI load met by additional renewables, storage or imports rather than grid gas                                                                           |
| <b>Energized battery storage and interconnector flows</b>       | Saudi Energy results; Ministry of Energy; SPPC awards; SPA                                              | How much of a constant load can be carried through non-solar hours without thermal generation                                                                    |
| <b>Aramco realized crude price</b>                              | Aramco quarterly results                                                                                | Each \$10 moves the Measure A break-even tariff by 3.7–4.0 halalah/kWh                                                                                           |

Source: Argaam Intelligence Research

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Taken together, these signals let readers test our findings as Saudi AI capacity grows. Data centers running below full power use less energy. New solar and other renewable supply reduces the fuel needed to power them.

A larger facility than assumed raises the total. And a tighter gas supply raises the cost in barrels, because it pushes the extra demand onto oil-burning plants.

The question the signals answer is whether new power supply can grow fast enough, and at a low enough cost in lost oil, to stop AI from reducing the amount of oil the Kingdom can free from its power plants. If summer oil burning keeps falling as AI capacity grows, the cost is smaller than our figures suggest. If it stays high, our concern holds.



# CONCLUSION

## AI must earn its return above the power meter

Saudi Arabia's new gas can support a bigger digital economy, or it can cut the oil burned in its power plants. The same gas cannot do both. Running on gas alone, HUMAIN's 1.9 gigawatts would use about all the gas from Jafurah's first phase. That gas could otherwise free 45,000–49,000 barrels of oil a day, or up to 70,000–81,000 if it replaced oil-fired plants.

At Aramco's second-quarter price of \$108 a barrel, the oil behind each megawatt-hour is worth about \$110 on Measure A, within a range of \$106–116, and \$166–193 on Measure B. To justify the gas it uses, AI has to create at least that much value per megawatt-hour before paying for power. The electricity bill covers \$48. The rest, \$58–68 on Measure A or \$118–145 on Measure B, has to come from what is built on the computing power. Every \$10 rise in the oil price adds about \$10 to that requirement.

How the data centers are built and run will decide which way the figure moves. More gas, efficient cooling and computing work shifted to sunny hours would ease the pressure. Steady demand during summer peaks or a gas shortage would add to it.

Two signals are coming. Aramco's third-quarter results, due in early November, will show whether its gas output has recovered. The electricity price set for new data centers will show what the state thinks a round-the-clock megawatt-hour is worth. The strongest case for Saudi AI is one in which computing earns enough per megawatt-hour to justify the energy it uses, and grows in step with the supply needed to power it.

