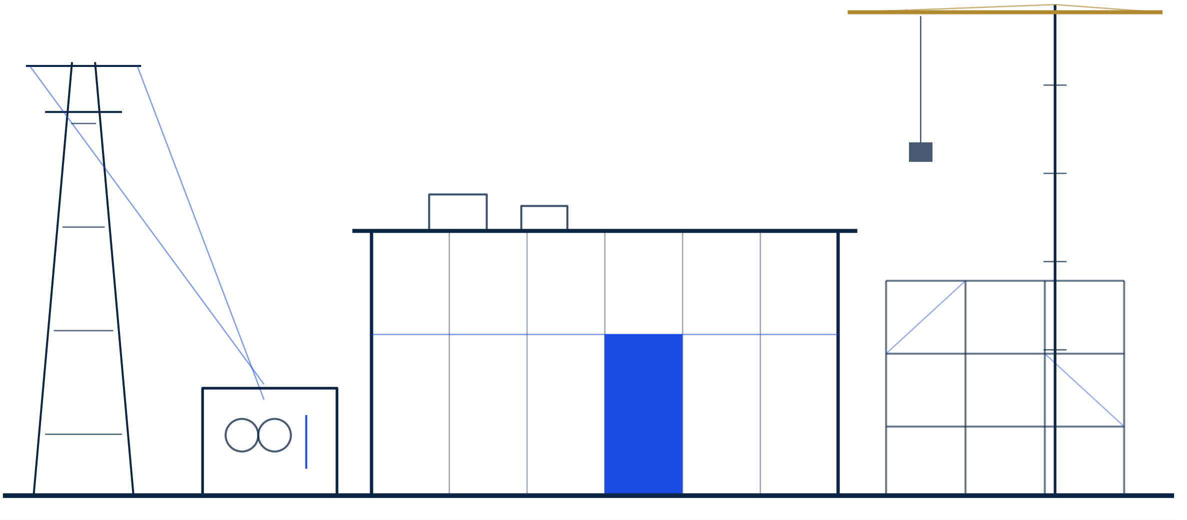
AI Infrastructure 2027

10 Predictions That Will Reshape Data Centre Strategy

Power, density, geography and execution are redefining where AI infrastructure gets built, and who wins.



Karim Gaber Saleh | August 2026

INDEPENDENT RESEARCH

AI infrastructure is entering an execution-constrained era.

The first constraint was compute.

GPUs, accelerators and access to advanced AI capacity dominated infrastructure strategy.

The next constraint is execution.

The challenge is increasingly whether that compute can be:

Powered. Cooled. Connected. Energised. Delivered.

COMPUTE SCARCITY

EXECUTION SCARCITY

- Compute
- Power
- Grid
- Cooling
- Infrastructure

OPERATIONAL AI CAPACITY

> **The competitive advantage is shifting from securing compute to securing the conditions required to make compute operational.**

The AI buildout is accelerating faster than the infrastructure around it.

Compute demand is scaling rapidly. Power, grids and physical delivery move on very different timelines.

AI DEMAND → ELECTRICITY → GRID CAPACITY → TIME-TO-POWER → EXECUTION

~945 TWh

Projected global data-centre electricity consumption by 2030

More than double today's level

IEA, ENERGY AND AI

2,500+ GW

Generation, storage and large-load projects in grid connection queues globally

Grid infrastructure is becoming a critical execution bottleneck

IEA, ELECTRICITY 2026

2–10 years

Indicative grid-connection waiting range across European markets

In some major data-centre hubs, waits can approach the upper end of this range

IEA

> **The constraint is shifting from access to compute toward the ability to turn compute into operational capacity.**

Sources: International Energy Agency, Energy and AI; Electricity 2026

PREDICTION 01

96 / 100 · VERY HIGH CONFIDENCE

Time-to-power becomes more valuable than nominal MW.

Available power is not the same as executable power.

A large theoretical power allocation that cannot be delivered within the investment horizon may be less valuable than a smaller connection available much sooner.

ILLUSTRATIVE COMPARISON

SITE A

200 MW

NOMINAL CAPACITY

7 years

INDICATIVE TIME TO POWER

More power, later

SITE B

100 MW

NOMINAL CAPACITY

2 years

INDICATIVE TIME TO POWER

Less power, earlier

Which site creates usable AI capacity first?

DECISION LENS

Executable Power = MW × Delivery Probability × Time-to-Energisation

Speed to power is now the primary criterion driving data-centre site selection.

JLL, GLOBAL DATA CENTER OUTLOOK 2026

European grid-connection waits can range approximately 2–10 years, with some established data-centre hubs toward the upper end.

IEA

> **For AI infrastructure, the strategically relevant question is no longer simply "How many MW?" but "How many MW, by when, with what delivery confidence?"**

Sources: JLL, Global Data Center Outlook 2026; International Energy Agency

PREDICTION 02

88 / 100 · HIGH CONFIDENCE

European AI infrastructure growth broadens beyond FLAP-D.

Established hubs remain important, but incremental AI capacity increasingly expands into a broader set of European markets.

ESTABLISHED HUBS

Frankfurt · London · Amsterdam · Paris · Dublin

EMERGING AI INFRASTRUCTURE LOCATIONS

Finland · Spain

- AI-scale power demand
- Land requirements
- Grid constraints in established hubs

BROADER GEOGRAPHIC OPPORTUNITY

More than half of expected AI-related growth is projected across Tier 2 and emerging EMEA markets.

JLL, EMEA DATA CENTRE REPORT 2026

Spain and Finland are among the markets emerging as new European data-centre hubs.

INTERNATIONAL ENERGY AGENCY

FLAP-D IS NOT DISAPPEARING.

Connectivity, customer density, talent and established ecosystems continue to give incumbent hubs major advantages.

> **The European location question is shifting from “Which established hub?” toward “Which portfolio of established and emerging markets offers the most executable capacity?”**

Sources: JLL, EMEA Data Centre Report 2026; International Energy Agency

PREDICTION 03

97 / 100 · VERY HIGH CONFIDENCE

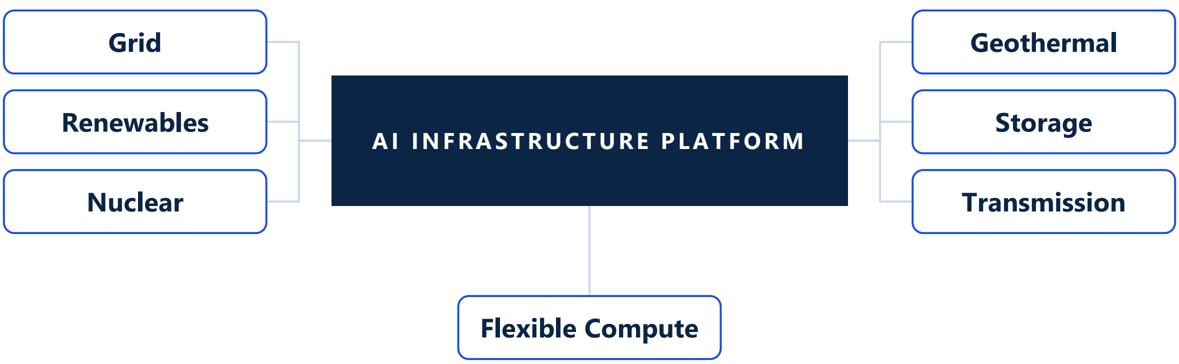
Hyperscalers move from energy procurement toward energy orchestration.

Hyperscalers are no longer simply large electricity customers.

AI infrastructure growth increasingly requires them to influence what generation is developed, where it sits, how it is financed, grid, storage, tariffs and when compute consumes electricity.

ENERGY PROCUREMENT · TRADITIONAL MODEL

ENERGY ORCHESTRATION · EMERGING MODEL



GOOGLE

12+ GW

Net-new clean-energy agreements signed in 2025

Nearly 35 GW in cumulative agreements since 2010

GOOGLE, 2026 ENVIRONMENTAL REPORT

AMAZON

Up to 1.9 GW

Nuclear capacity associated with AWS data-centre growth in Pennsylvania

AMAZON

THIS IS NOT VERTICAL INTEGRATION INTO THE UTILITY BUSINESS.

It is deeper participation in generation, grid investment, technology, tariffs and power-system design.

WHAT TO WATCH

Advanced nuclear · Geothermal · Behind-the-meter generation · Storage · Grid investment · Flexible tariffs

> **For hyperscale AI, energy strategy is becoming infrastructure strategy.**

Sources: Google, 2026 Environmental Report; Amazon

PREDICTION 04

88 / 100 · HIGH CONFIDENCE

Cooling architecture becomes a **strategic capacity decision.**

As AI compute density rises, cooling architecture increasingly determines what compute a facility can support, where it can be built and how efficiently it can operate.

AI COMPUTE DENSITY

THERMAL LOAD

COOLING ARCHITECTURE

Power efficiency | **Water requirements** | **Facility design** | **Retrofit feasibility**

STRATEGIC TRADE-OFF · COOLING CHOICE IS SET BY THE INTERACTION OF

Rack density	**Climate**	**Water availability**
Existing facility design	**Energy efficiency**	**CapEx**

Microsoft's newer AI-optimised data-centre designs use chip-level closed-loop cooling designed to eliminate water evaporation for cooling.

MICROSOFT

IMPLICATION

Cooling is moving upstream from facility engineering into site, capacity and portfolio decisions.

AIR COOLING IS NOT DISAPPEARING.

Different workloads, densities, climates and facilities will continue to require different cooling architectures.

WHAT TO WATCH

Rack density · Direct-to-chip cooling · Retrofit cost · WUE · Heat rejection · Water availability

> **The question is no longer simply “How do we cool the facility?” but “What infrastructure can support the compute density we intend to deploy?”**

Sources: Microsoft, Next-generation datacenter cooling design; Microsoft sustainability reporting

PREDICTION 05

97 / 100 · VERY HIGH CONFIDENCE

Electrical equipment becomes part of the strategic AI supply chain.

GPUs create no value until they are energised. The AI supply chain no longer ends at silicon — it extends into transformers, switchgear, substations and transmission.

GPU / COMPUTE

TRANSFORMER

SWITCHGEAR

SUBSTATION

GRID CONNECTION

ENERGISED AI CAPACITY

CONSTRAINT ZONE

Long-lead electrical equipment. Procurement timelines now set the pace of AI capacity delivery.

Compute secured ≠ Compute operational

4–9×

Reported increase in prices for some transformer categories over five years.

U.S. DEPARTMENT OF ENERGY, 2026

PROCUREMENT REALITY

Extended lead times and limited manufacturing capacity mean long-lead electrical items must be secured far earlier in the development cycle.

TRADITIONAL AI SUPPLY-CHAIN FOCUS

GPUs · Accelerators · Networking

EXPANDING AI SUPPLY-CHAIN FOCUS

GPUs · Networking · Transformers · Switchgear · Substations · Grid equipment

WHAT TO WATCH

Equipment lead times · Manufacturing capacity additions · Earlier procurement commitments

> **Owning the compute does not matter if you cannot energise it.**

Source: U.S. Department of Energy, Strengthening America's Grid Supply Chain, 2026

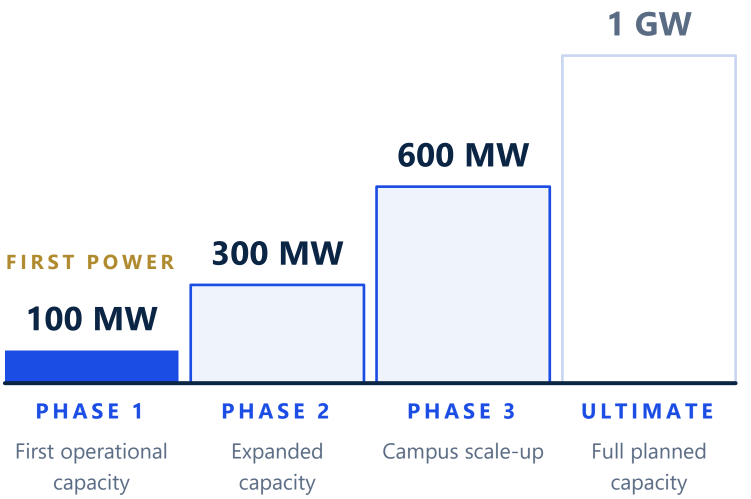
PREDICTION 06

90 / 100 · HIGH CONFIDENCE

Phased power becomes fundamental to mega-campus design.

Gigawatt-scale ambition is colliding with delivery timelines. Waiting for the full ultimate power requirement before operating can destroy years of value.

How quickly can the first revenue-producing MW go live?



WHY PHASING MATTERS

- Earlier revenue
- Earlier compute deployment
- Reduced dependency on final grid buildout
- Better alignment of CapEx with available power

ILLUSTRATIVE CAMPUS PHASING, NOT ACTUAL PROJECT DATA

REAL-WORLD EVIDENCE · UK AI GROWTH ZONE

~1.1 GW

Planned demand

NATIONAL GRID

Capacity delivery phased from 2028, with further connections by 2031.

OLD QUESTION

When is the whole campus complete?

NEW QUESTION

When does the first usable MW generate value?

This is primarily a mega-campus prediction. Smaller facilities and power-rich markets may continue to receive capacity through more conventional delivery models.

WHAT TO WATCH

First-power milestones · Staged grid connections · Phase sizes · Time from first MW to ultimate capacity

> **For mega-campus AI infrastructure, first-power may become as strategically important as ultimate capacity.**

Sources: National Grid; JLL, Global Data Center Outlook 2026

PREDICTION 07

97 / 100 · VERY HIGH CONFIDENCE

Sovereign AI becomes physical-infrastructure policy.

Sovereign AI is usually framed as models, data and regulation. But no country can build meaningful sovereign capacity if the underlying compute and physical infrastructure depend entirely on capacity controlled elsewhere.

AI SOVEREIGNTY = COMPUTE + CHIPS + POWER + NETWORKS + DATA CENTRES

SOVEREIGN AI CAPABILITY

COMPUTE	CHIPS	POWER	NETWORKS	DATA CENTRES

ENERGY POLICY · INDUSTRIAL POLICY · INVESTMENT · PLANNING · DIGITAL POLICY

THE POLICY ENVIRONMENT THAT ENABLES PHYSICAL CAPACITY

KEY EVIDENCE · EU AI GIGAFACTORIES

Up to 7

AI Gigafactories included in the July 2026 European Commission call.

€30bn+

Total investment intended to be mobilised, combining public support with expected private investment.

EUROPEAN COMMISSION, 2026

19 AI Factories already established across the European AI infrastructure ecosystem — a separate element of the wider strategy. European Commission.

SOVEREIGN AI, EARLY DEBATE

Models · Data · Regulation

SOVEREIGN AI, INFRASTRUCTURE ERA

Models · Data · Compute · Chips · Power · Networks · Physical Capacity

Physical capacity does not guarantee AI competitiveness. Publicly supported infrastructure can still underperform if utilisation, economics, energy costs or surrounding AI ecosystems are weak.

WHAT TO WATCH

AI Gigafactory awards · Sovereign compute programmes · Public-private financing · Energy allocation · Semiconductor access

> **AI strategy is becoming infrastructure strategy.**
>
> National AI ambition now depends on securing compute, energy and physical capacity at scale.

Source: European Commission, AI Factories and AI Gigafactories, 2026

PREDICTION 08

87 / 100 · HIGH CONFIDENCE

Water becomes an infrastructure constraint **in water-stressed markets.**

Water has historically been discussed as a data-centre sustainability metric. In water-stressed locations it is increasingly a physical design variable, shaping cooling architecture, site selection, permitting and community acceptance.

WATER AS ESG METRIC → WATER AS DESIGN VARIABLE → WATER AS SITE-SELECTION CONSTRAINT

HIGHER COOLING INTENSITY ↑

Cooling-led design	**Closed-loop or dry cooling becomes the design default**
Conventional cooling remains viable	Water-aware design and reuse

LOW WATER STRESS — HIGH WATER STRESS

Conceptual framing, not a ranking of markets.

DESIGN RESPONSES

- Closed-loop cooling
- Dry cooling
- Reclaimed water
- Hybrid systems
- Climate-sensitive design

Engineering responses to local conditions, not a ranked hierarchy.

KEY EVIDENCE

125m+ litres / year

Potential water evaporation avoided per facility through Microsoft's newer zero-water-evaporation cooling design.

MICROSOFT

GEOGRAPHIC COUNTERPOINT

In cooler locations such as Dublin and Amsterdam, Microsoft reports that water may be required for cooling less than 5% of the year.

MICROSOFT

Water will not be the next universal power bottleneck.
Climate, cooling technology and access to reclaimed water can materially reduce direct water dependency.

WHAT TO WATCH

Water restrictions · Reclaimed-water infrastructure · Cooling architecture · Permitting · Community opposition · Watershed stress

> **Water stress should move into site diligence alongside power, grid access and permitting in markets where local conditions make it material.**

Sources: Microsoft, next-generation datacenter cooling design; Microsoft sustainability reporting

PREDICTION 09

89 / 100 · HIGH CONFIDENCE

Execution risk increasingly enters capital-allocation decisions.

Strong demand, attractive economics and available capital no longer make a project investable on their own. Probability of execution becomes an explicit part of investment attractiveness.

TRADITIONAL INVESTMENT LENS	AI INFRASTRUCTURE INVESTMENT LENS
Demand + Economics + Financing	Demand + Economics + Financing + **EXECUTION PROBABILITY**

EXECUTION PROBABILITY

POWER DELIVERY	PERMITTING	LONG-LEAD EQUIPMENT
SUPPLY CHAIN	CONSTRUCTION CAPABILITY	COMMISSIONING / ENERGISATION

Speed to power is now the primary criterion driving data-centre site selection.

JLL, GLOBAL DATA CENTER OUTLOOK 2026

Grid constraints are increasingly influencing where infrastructure capital can realistically be deployed.

INTERNATIONAL ENERGY AGENCY

INVESTABLE CAPACITY = NOMINAL CAPACITY × EXECUTION PROBABILITY

Conceptual decision lens developed for this report, not an established industry metric.

ILLUSTRATIVE COMPARISON

PROJECT A	PROJECT B
500 MW announced High execution uncertainty	**300 MW announced** High delivery confidence

Which pipeline should command greater investment confidence?

Execution does not replace traditional investment criteria. Demand, returns, financing and market economics remain fundamental. Execution probability joins them as an increasingly important variable.

Can investors measure execution probability before a project formally reports delay?

WHAT TO WATCH

Project delays · Capital reallocation · Powered-land valuation · Connection certainty · First-power slippage

> **The most valuable pipeline may not be the largest pipeline. It may be the one most likely to become energised, operational capacity on time.**

Sources: JLL, Global Data Center Outlook 2026; International Energy Agency

PREDICTION 10

82 / 100 · MEDIUM-HIGH CONFIDENCE

Compute flexibility emerges as a grid-capacity tool.

Data centres have traditionally been treated as fixed, inflexible large loads. AI infrastructure makes suitable portions of compute dynamically responsive to grid conditions.

DATA CENTRE = FIXED LARGE LOAD	AI DATA CENTRE = PARTIALLY FLEXIBLE LOAD

TRADITIONAL MODEL

GRID

FIXED DATA-CENTRE LOAD

Inflexible demand profile. Capacity sized for the peak.

EMERGING MODEL

GRID SIGNAL

AI COMPUTE ORCHESTRATION

FLEXIBLE WORKLOAD

RESPONSE MODES

DELAY	RESCHEDULE	SHIFT LOCATION	REDUCE TEMPORARILY	PRIORITISE CRITICAL WORKLOADS

Orchestration of suitable workloads — not switching a data centre off.

KEY EVIDENCE · UK GRID-FLEXIBILITY DEMONSTRATION

96

Blackwell Ultra GPUs in a National Grid demonstration with Emerald AI, EPRI, Nebius and NVIDIA.

>1/3

Demand reduction achieved in under one minute, with priority workloads continuing.

NATIONAL GRID, 2026

Demonstration, not broad commercial adoption.

POTENTIAL STRATEGIC EFFECT

Flexible compute → grid responsiveness → better use of constrained capacity.

THE QUESTION IS CHANGING

Today: How much electricity does it require?

Future: How much, when, and how flexible is that demand?

WHAT WOULD PROVE THIS WRONG? If flexible compute stays confined to pilots, absent from commercial tariffs or connection agreements by 2028–2029.

Technical feasibility is not commercial adoption. SLAs, regulation and orchestration remain unresolved.

WHAT TO WATCH Flexible connection agreements · Dynamic tariffs · Grid-response programmes

> **Future AI capacity may depend partly on how intelligently compute consumes power, not simply on how much power exists.**

Source: National Grid, Emerald AI grid-flexibility demonstration, 2026

SYNTHESIS

PREDICTIONS 01 – 10

The bottleneck is moving outward from the GPU.

AI infrastructure advantage increasingly depends on the physical systems required to turn compute into operational capacity.

SYSTEM Energy strategy · Grid infrastructure · Geography · Government policy · Capital allocation

DELIVERY Transformers · Switchgear · Supply chain · Construction · Commissioning

SITE Power · Grid connection · Land · Permitting

FACILITY Cooling · Electrical systems · Water

AI COMPUTE / GPU

A GPU can be available while operational AI capacity remains constrained by any one of the surrounding layers.

EVERY PREDICTION CONNECTS TO THE SAME EXECUTION SYSTEM

01 TIME-TO-POWER	02 GEOGRAPHIC BROADENING	03 ENERGY ORCHESTRATION	04 COOLING ARCHITECTURE	05 ELECTRICAL SUPPLY CHAIN
06 PHASED POWER	07 SOVEREIGN AI	08 WATER CONSTRAINT	09 EXECUTION RISK	10 COMPUTE FLEXIBILITY

COMPUTE AMBITION ≠ OPERATIONAL AI CAPACITY

COMPUTE + POWER + COOLING + GRID + EQUIPMENT + DELIVERY = OPERATIONAL AI CAPACITY

Conceptual execution chain

> **The scarce resource is increasingly not compute alone.**
> **It is executable infrastructure.**

THE OLD QUESTION
Can we secure the GPUs?

THE EMERGING QUESTION
Can we deliver the entire system required to make them productive?

Compute remains strategically important. The change is that the surrounding physical infrastructure increasingly determines how quickly compute can become productive capacity.

EXECUTIVE ACTION

WHAT TO DO DIFFERENTLY

Five moves for the execution-constrained AI infrastructure era.

The common thread across the ten predictions is simple: plan around **executable capacity, not theoretical capacity.**

01 MEASURE TIME-TO-POWER

Evaluate MW available + delivery timing + connection certainty — not headline MW.

02 DESIGN FOR PHASED CAPACITY

Treat first-power as a strategic milestone. Align phasing, compute deployment and CapEx.

03 MOVE CRITICAL INFRASTRUCTURE UPSTREAM

Treat long-lead electrical equipment, cooling and energy strategy as early development decisions.

04 PRICE EXECUTION RISK INTO CAPITAL

Assess pipelines on probability of delivery. Distinguish announced from executable capacity.

05 BUILD CROSS-SYSTEM EXECUTION VISIBILITY

Power, procurement, design, schedule and commissioning form a single delivery system and must be read together.

FROM	TO
How much capacity is in the pipeline?	**How much can actually become operational, by when, and with what confidence?**

WHAT THIS MEANS BY ROLE

OPERATORS	INVESTORS	UTILITIES	GOVERNMENTS	HYPERSCALERS
Optimise for executable capacity and first-power.	Assess delivery probability, not headline MW alone.	Develop connection models recognising scale and flexibility.	Treat AI ambition as energy and infrastructure policy.	Integrate compute, energy and physical-infrastructure strategy.

> **The winners of the next AI infrastructure cycle will not simply secure more resources. They will coordinate them better.**

Strategic implications derived from Predictions 01–10

CONCLUSION

The winner isn't who announces the most AI capacity. It's who can actually deliver it.

The strategic unit of AI infrastructure is shifting toward **energised, operational compute delivered within the required commercial timeframe.**

Compute remains critical. But competitive advantage increasingly depends on coordinating the power, grid, cooling, equipment, capital and delivery systems required to make compute productive.

ANALYTICAL CONFIDENCE SCORE / 100

01	TIME-TO-POWER	96
02	GEOGRAPHIC BROADENING	88
03	ENERGY ORCHESTRATION	97
04	COOLING ARCHITECTURE	88
05	ELECTRICAL SUPPLY CHAIN	97
06	PHASED POWER	90
07	SOVEREIGN AI	97
08	WATER CONSTRAINT	87
09	EXECUTION RISK	89
10	COMPUTE FLEXIBILITY	82

These scores are structured analytical assessments, not statistical probabilities.

RESEARCH METHODOLOGY

Each candidate prediction was assessed using a 100-point framework across five dimensions.

30%	20%	20%	15%	15%
EVIDENCE STRENGTH	INDEPENDENT SUPPORT	CAUSAL LOGIC	2027–2029 RELEVANCE	FALSIFIABILITY

Candidate predictions were tested against contradictory evidence. Weak, overlapping or insufficiently falsifiable claims were removed or reframed.

Primary and authoritative sources were prioritised, including the International Energy Agency, European Commission, National Grid and major infrastructure operators.

RESEARCH CUT-OFF
August 2026

RESEARCH AND ANALYSIS
Karim Gaber Saleh · Independent Research

Which constraint will matter most to AI infrastructure execution by 2027?