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Abstract

This report compiles and compares 2027 economic projections published by the International Monetary Fund, the OECD, the World Bank, and the central banks of the United States, the eurozone, the United Kingdom, and Japan, and sets that macro outlook alongside a second, equally weighted line of inquiry: the physical and regulatory economics of the artificial intelligence infrastructure now reshaping how, and where, economic growth itself is generated.

On the macro side, the report's central finding is that institutional forecasts for 2027 diverge genuinely rather than converging on a technical consensus. The IMF's 3.4% world growth projection and the OECD's 3.0% trace back to different explicit assumptions about how long the 2026 Middle East conflict will last. On the AI infrastructure side, this edition adds a dedicated analysis built around four questions. How large is data center electricity demand actually projected to grow? How are governments across the EU, Ireland, the Netherlands, Singapore, China, and the United States responding, and why do their regulatory models differ so sharply? What does the environmental cost of unused corporate data, “dark data,” reveal about a gap none of those regulatory models currently addresses? And which efficiency technologies are already closing part of that gap in practice, regardless of what regulation requires?

A connecting pattern runs through both halves of this report: the same AI-driven investment the IMF credits with sustaining the 2027 growth recovery moves in close parallel with the electricity demand documented in Section 7, meaning the macro forecast and the infrastructure reckoning are not two separate stories but two measurements of one story, examined at different levels of resolution. This report treats that relationship as a pattern worth tracking together rather than a quantified causal chain; see the named limitation in Section 2.

Keywords: global economic outlook, 2027 projections, GDP growth forecast, monetary policy, artificial intelligence, data centers, dark data, energy efficiency, data center regulation.

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Executive Summary

2026 tested the resilience of the global economy on two fronts this report treats as connected rather than separate. An armed conflict in the Middle East disrupted energy markets and reshaped the macro outlook for 2027. At the same time, the electricity demand of AI infrastructure crossed a threshold large enough that governments, grid operators, and investors now treat it as a first-order economic variable in its own right, not a technology-sector footnote. This report synthesizes both.

The macro half of this report compares 2027 growth, inflation, and monetary policy projections across the leading multilateral institutions and central banks, finding a genuine, well-documented divergence in how far the 2027 recovery will go. The second half, new to this edition, examines the AI infrastructure question directly. It asks how much electricity data centers will actually require, and finds the world's major jurisdictions regulating that demand in strikingly different ways. It asks why a comparatively obscure corporate practice, retaining data nobody uses, carries its own underexamined environmental cost. And it asks which technologies are already making measurable progress on efficiency, regardless of what regulation requires.

Dimension	Finding
Growth	The IMF projects 3.0% (2026) and 3.4% (2027); the OECD projects 2.9% and 3.0%. The divergence for 2027 reflects different assumptions about the Middle East conflict's duration. It is not a methodological disagreement.
Monetary policy	The Fed has raised rates twice in 2026, with its September projection placing 2027 rates at 4.10%, versus 3.1% projected in December 2025, a genuine reversal from the prior easing path.
AI infrastructure demand	US data center electricity demand is set to more than double, from 31 GW (2025) to 66 GW (2027), a physical constraint now large enough to function as a supply-side risk in its own right.
Global regulatory response	Six jurisdictions, six genuinely different regulatory models, with no convergence toward a single standard. Developed in Section 7.2.
The dark data gap	Over half of corporate data in storage is estimated to be unused “dark data,” carrying a carbon footprint in the low millions of tonnes of CO ₂ annually, and remains almost entirely outside current data center regulation.

Table ES.1: Summary of findings, macro and AI infrastructure. Source: ISDO compilation from the institutional sources cited throughout this report.

The two halves of this report are not separate stories told side by side. The AI-related investment the IMF itself credits with sustaining 2027 growth expectations moves together with the electricity demand Section 7 documents in physical terms, gigawatts, PUE ratios, grid connection policies, not financial ones, a parallel this report tracks explicitly rather than treats as a proven mechanism (see Section 2). A reader who takes only the growth forecast from this report, without the infrastructure reckoning behind it, is reading half the story.

1. Introduction: The 2027 Question After a Disrupted 2026

The global economy entered 2026 with reasonable momentum, sustained by AI-related investment, accommodative financial conditions, and more commercial resilience than expected following the 2025 tariffs. That momentum was interrupted in the first quarter by the outbreak of an armed conflict in the Middle East that directly affected transit through the Strait of Hormuz and regional energy infrastructure, generating a supply shock that has shaped the year's economic trajectory ever since.

The question structuring this report is not whether the global economy will grow in 2027, but by how much, and with what composition of risk, including a risk this edition treats at far greater length than its first draft did: the physical capacity constraints of the AI infrastructure now embedded in the growth forecast itself. Multilateral institutions agree that 2027 will be, broadly, a year of relative recovery from 2026. They disagree, in no trivial way, on the magnitude of that recovery, and on a largely separate track, the world's major regulatory jurisdictions have begun responding to AI's physical footprint in ways that diverge just as sharply as the growth forecasts do.

This report is organized in two parts of comparable weight. Sections 3 through 6 compare growth, inflation, monetary policy, and regional projections across institutions, following the same method as the report's first edition. Section 7 is new: a dedicated examination of AI infrastructure covering the scale of electricity demand, the global legislative response, the unaddressed question of unused corporate data, and the efficiency technologies now being deployed against all of it. Section 8 covers the report's remaining risk factors, and Section 9 concludes.

2. Methodology and Sources

This report compiles and compares projections and findings already published by primary institutional sources; it does not build its own forecasting model. The sourcing hierarchy prioritizes, in this order: official publications from multilateral organizations and government bodies (IMF, OECD, World Bank, European Commission, national regulators), statements and projections from central banks, and analysis from leading private institutions and research firms as corroboration and contrast, never as the sole source for a central figure.

Section 7 draws on a different but parallel sourcing base appropriate to its subject: EU and national regulatory texts and the European Commission's own compliance reporting, energy-sector research firms (Goldman Sachs Research, the International Energy Agency), congressional testimony, and peer-reviewed and trade-press coverage of data center efficiency technology. Where sources offer different figures for the same indicator, this report presents both explicitly rather than choosing one, unless a later publication from the same institution clearly supersedes an earlier figure, in which case the more recent figure is used and each update's date is stated.

On the nature of these figures

Every economic projection is, by definition, conditional on assumptions that may not hold. The figures in this report reflect the state of institutional forecasts and regulatory frameworks at the time of publication, not certainty about the future. This report does not constitute investment advice.

The reference time horizon is calendar year 2027, with 2026 included as a point of comparison throughout. Growth figures refer, unless otherwise stated, to percentage change in real GDP. Inflation figures refer to headline inflation unless core inflation is explicitly indicated. Data center efficiency figures use Power Usage Effectiveness (PUE) unless otherwise noted; PUE is defined in Annex B.

Two named limitations. First, Section 7.3's examination of dark data draws on a research literature that is, by its own authors' account, still emerging, academic policy briefings and one OECD innovation-platform publication rather than the regulatory-document-level sourcing this report uses elsewhere in Section 7.2; the section states this explicitly rather than presenting that evidence base as equivalent in weight to a European Commission compliance report. Second, this report treats AI-related investment and data center electricity demand as a connected pattern, the same AI buildout the IMF credits with 2027 growth resilience in Section 3 and the demand Section 7.1 documents in gigawatts, without claiming to have traced a specific capital-expenditure-to-electricity-demand mechanism linking the two; the relationship is presented as a parallel worth tracking together, not a quantified causal chain.

3. Growth: Institutional Divergence and the Recovery Narrative

The International Monetary Fund revised down its global growth forecast for 2026 on three successive occasions over the course of the year, from 3.3% in January to 3.1% in April and 3.0% in July, as the Middle East conflict dragged on longer than initially assumed. The forecast for 2027, however, followed a different path: it held steady at 3.2% through the first two updates and was revised up to 3.4% in the July release.

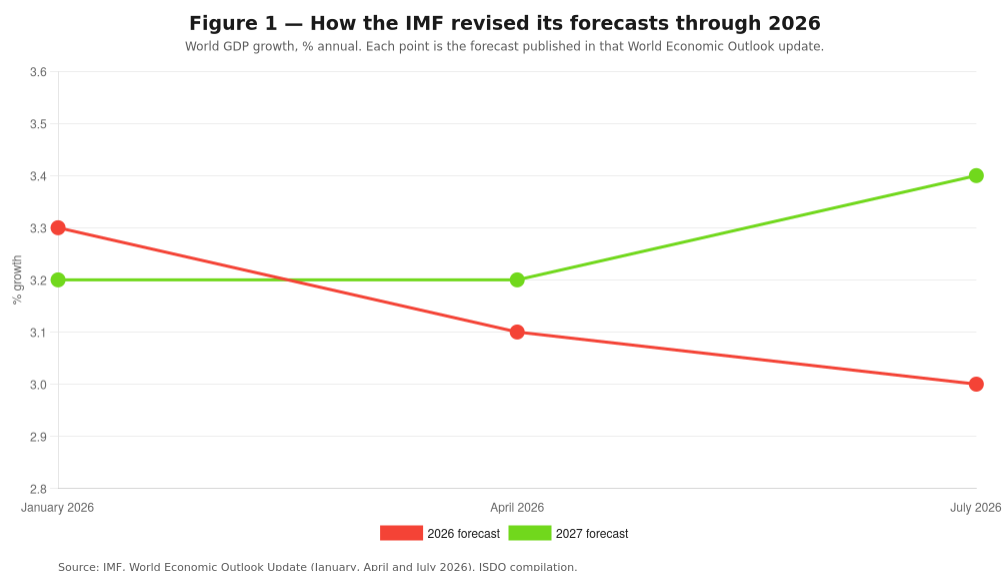


Figure 1: How the IMF revised its forecasts through 2026. Source: IMF, World Economic Outlook Update (January, April, and July 2026); ISDO compilation.

This “crossing” pattern between the two lines is not accidental: it reflects the IMF's own explicit logic, under which the war shock weighs on 2026 but its effects are expected to fade during 2027, allowing for a sharper recovery than would have been projected before the conflict began. The IMF itself attributes the resilience observed in 2026 to AI-linked investment in economies integrated into the technology value chain, which has partly offset the drag on energy-importing countries, a connection Section 7 of this report examines directly in physical terms.

The OECD, however, does not share the same degree of optimism for 2027. Its June 2026 Economic Outlook places world growth at 3.0% for 2027, against the IMF's 3.4%, a four-tenths gap that is not trivial at this scale. EY-Parthenon, as a private-sector reference point, sits between the two, at 3.2%.

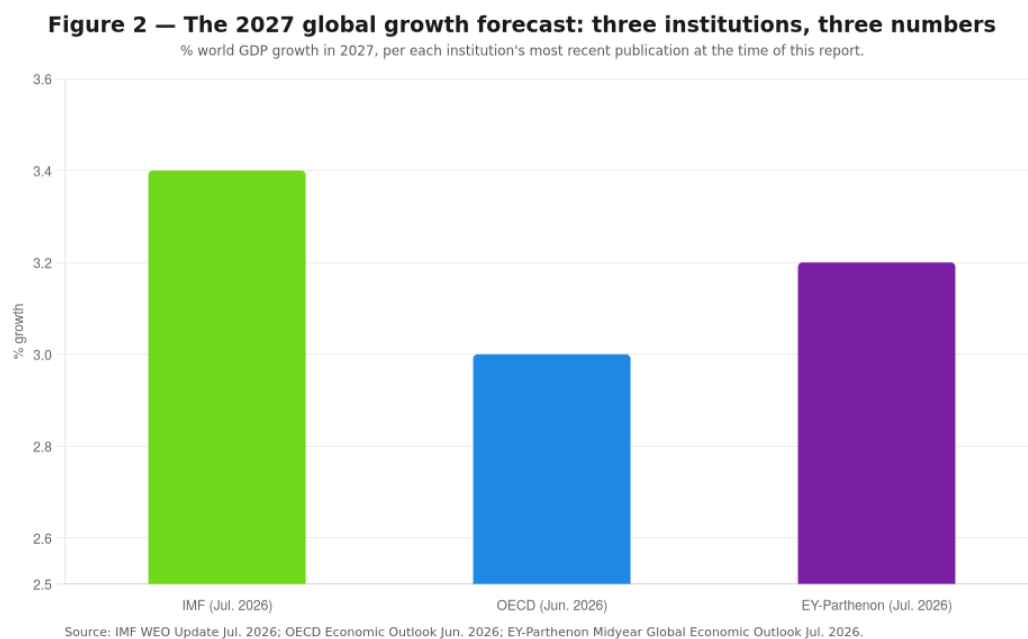


Figure 2: World growth forecast for 2027, institutional comparison. Source: IMF WEO Update Jul. 2026; OECD Economic Outlook Jun. 2026; EY-Parthenon Jul. 2026.

The origin of this divergence, according to the publications themselves, is not methodological but a matter of conflict assumptions: the IMF builds its central forecast on the assumption that the conflict “remains limited in duration and scope,” while the OECD, in its June publication, explicitly presents two distinct scenarios, one of “time-limited disruption” and another of “prolonged disruption,” with the latter implying OECD-area growth of just 0.5% in 2027 against 1.7% under the more benign scenario. The 3.0% figure the OECD uses as its central case therefore sits at a more cautious point within that uncertainty range than the IMF's single assumption.

4. Inflation: The Energy Shock's Long Tail

The energy shock stemming from the Middle East conflict has reversed, at least temporarily, the disinflationary trend that dominated projections at the end of 2025. The OECD projects that headline inflation across G20 economies will reach 4.0% in 2026, a full percentage point and two-tenths above what the OECD itself anticipated before the conflict broke out, before moderating to 2.5-2.7% in 2027 as energy pressures fade.

Core inflation, which excludes energy and fresh food, shows a more contained path: the OECD places it on a decline from 2.6% to 2.3% between 2026 and 2027, a reminder that much of 2026's inflationary pickup has a specific and potentially transitory origin, the price of energy, rather than a broad-based reacceleration of prices.

The IMF itself acknowledges in its July update that “global disinflation has stalled,” a more cautious formulation than earlier editions of the report, which described a firmer downward path. By country, the inflation projections for 2027 in the IMF's April report place the euro area at 2.2%, Japan at 2.3%, and the United States at 2.1%, all close to the 2% target most advanced-economy central banks maintain as a formal reference, even though the path to that point differs substantially across economies.

An upside risk flagged explicitly: the United Kingdom

The Bank of England has warned explicitly that a fresh episode of energy tension could push UK inflation, which stood at 3.1% in August 2026, above 4% in early 2027. This is the most explicit and quantified upside inflation warning for 2027 found among the sources consulted for this report.

One singular case worth noting on its own is Turkey, whose inflation the OECD projects at 26.7% for 2026 and 16.9% for 2027, figures that make plain how uneven the global disinflation trend really is, and that certain emerging economies face a structurally different price dynamic from advanced economies.

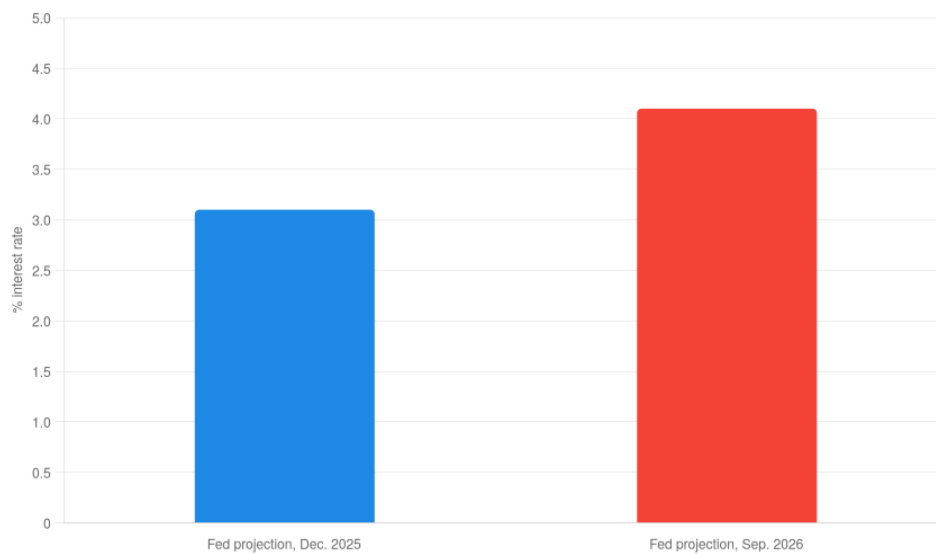
5. Monetary Policy: The Shift Toward “Higher for Longer”

The most newsworthy development in this report's monetary policy coverage is not a specific number but a change of direction. At the end of 2025, the Federal Reserve projected, at its December meeting, a single additional rate cut for 2026 and a terminal rate of 3.1% for 2027, consistent with a path of gradual normalization following the prior tightening cycle.

That path reversed entirely over the course of 2026. In June, the Federal Reserve raised rates for the first time since July 2023, placing them in the 3.75%-4.00% range. In September, it raised them again to 4.00%-4.25%, and its median projection for year-end 2027 rose to 4.10%, versus the 3.1% the same institution projected nine months earlier.

Figure 3 — The Fed's reversal: from one more cut to “higher for longer”

Federal funds rate projected for year-end 2027, % — same institution, two different Summary of Economic Projections (SEP) releases.



Source: Federal Reserve, Summary of Economic Projections, December 2025 and September 2026. ISDO compilation.

Figure 3: The Fed's reversal: from one more cut to “higher for longer.” Source: Federal Reserve, Summary of Economic Projections, December 2025 and September 2026.

The Federal Reserve's communication attributes this shift to inflation proving more persistent than anticipated, driven largely by the energy shock described in the previous section. The September Summary of Economic Projections itself signals that rates will remain elevated well into 2027, with the start of a gradual easing cycle not expected before 2028.

This trajectory is not shared equally by other advanced-economy central banks. The European Central Bank maintains a comparatively more accommodative stance, with the deposit rate at 2.50% and the refinancing rate at 2.65%, projecting euro-area inflation of 3.0% for 2026 but growth of just 0.9%, a combination that limits room for further hikes. The Bank of England has opted to hold rates at 3.75%, though on a split vote, six in favor of holding against three who wanted to raise to 4.00%, reflecting genuine internal disagreement over the balance of risks. The Bank of Japan, for its part, raised rates to 1.25% in September 2026, driven by yen weakness and rising energy and wage prices, a policy direction that contrasts with Japan's recent history of near-zero rates.

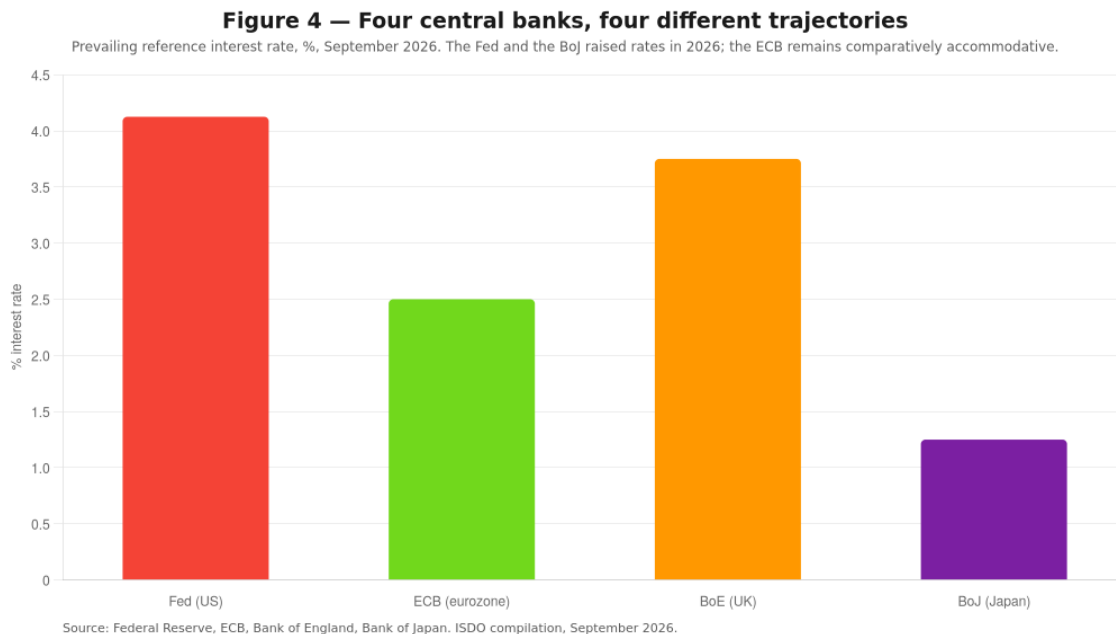


Figure 4: Four central banks, four different trajectories. Source: Federal Reserve, ECB, Bank of England, Bank of Japan; ISDO compilation, September 2026.

The overall reading is that 2026 has been, in monetary policy terms, a year of hawkish surprises across the major advanced economies, with the notable relative exception of the eurozone. For a reader following 2027 as it unfolds, the variable to watch is less the level of rates at any given moment than the speed with which each central bank signals the start of its easing cycle, something the institutions themselves have shown, in 2026, a willingness to revise faster than usual.

6. Regional Outlook

The IMF's country-level projections for 2027 confirm the persistence of the structural divergence between emerging and advanced economies that has characterized the past decade, with India and China growing far ahead of the United States, the eurozone, the United Kingdom, and Japan.

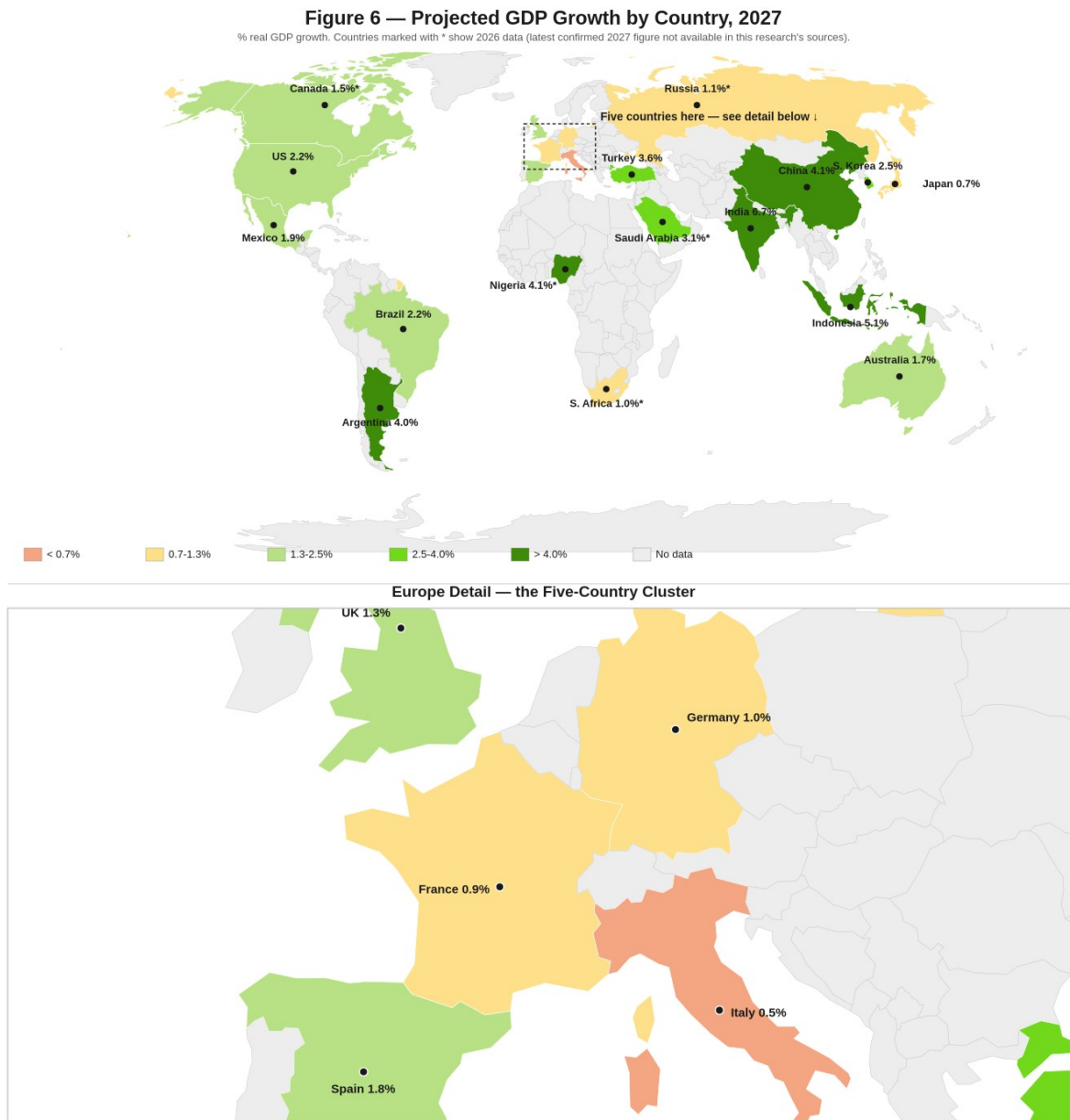


Figure 5: Projected GDP growth by country, 2027 (2026 where a confirmed 2027 figure was not available). Source: IMF, World Economic Outlook and WEO Update, April-July 2026; IMF press briefing transcript, July 8, 2026.

India remains the fastest-growing major economy, projected at 6.7% for 2027, sustained by private consumption and services activity. China, though in structural deceleration, projects growth of 4.1%, still higher than any advanced economy, against a backdrop of elevated oil prices and persistent trade uncertainty that the IMF itself flags as a drag on Chinese activity in 2026.

Among advanced economies, the United States (2.2%) is projected ahead of the United Kingdom (1.3%) and the eurozone (1.2%), with Japan closing out the group at 0.7%. Within the eurozone, country-level detail points to a moderate recovery in Germany after several years of stagnation, with France sustaining

similar growth despite political instability, and with Italy and Spain diverging sharply from each other, 0.5% against 1.8%, a gap wide enough that treating the eurozone as a single bloc obscures as much as it reveals.

Two emerging economies outside the eurozone illustrate the same point about aggregation. Brazil's own IMF country team revised its forecast up twice in 2026, ultimately reaching 2.4% and 2.2% for 2026 and 2027 respectively, an upward surprise the IMF attributes to a strong harvest and resilient private consumption. Mexico moved in the opposite direction, revised down to 1.2% for 2026 before a projected rebound to 1.9% in 2027, a pattern the IMF's own briefing links to trade-policy uncertainty affecting 2026 specifically rather than a structural downgrade.

Table 1 and Figure 5 extend to full G20 coverage, individually or through the eurozone aggregate, adding five economies beyond this report's earlier edition: Indonesia (5.1% both years), Argentina (3.5% / 4.0%, reaffirmed unchanged through its IMF program review), Turkey (2.9% / 3.6%, revised down for 2026 specifically on Middle East-linked energy costs), South Korea (2.6% / 2.5%, among the largest upward revisions in the July update), and Australia (1.9% / 1.7%). Turkey's inclusion here connects directly to Section 4: the IMF's own April briefing ties both its growth revision and its 26.7% 2026 inflation projection to the same Middle East energy channel documented throughout this report, not a separate national story.

Economy	2026	2027	Region
India	6.4%	6.7%	Asia
Indonesia	5.1%	5.1%	Asia
China	4.6%	4.1%	Asia
Nigeria	4.1%	n/a	Africa
Argentina	3.5%	4.0%	South America
Saudi Arabia	3.1%	n/a	Middle East
Turkey	2.9%	3.6%	Europe/Asia
South Korea	2.6%	2.5%	Asia
Brazil	2.4%	2.2%	South America
United States	2.3%	2.2%	North America
Spain	2.1%	1.8%	Europe
Australia	1.9%	1.7%	Oceania
Canada	1.5%	n/a	North America
Mexico	1.2%	1.9%	North America
Russia	1.1%	n/a	Europe/Asia

Economy	2026	2027	Region
United Kingdom	1.0%	1.3%	Europe
South Africa	1.0%	n/a	Africa
Eurozone (aggregate)	0.9%	1.2%	Europe
Germany	0.7%	1.0%	Europe
Japan	0.6%	0.7%	Asia
France	0.6%	0.9%	Europe
Italy	0.5%	0.5%	Europe

Table 1: IMF GDP growth projections by economy, 2026 and 2027, ranked by 2026 growth, covering all G20 members individually or via the eurozone aggregate. “n/a” marks economies for which a confirmed 2027 figure was not available in this research's sources as of September 2026; this reflects a gap in available updates, not a projection of zero growth. Source: IMF, World Economic Outlook and WEO Update, January-July 2026; IMF press briefing transcript, July 8, 2026.

7. The AI Infrastructure Reckoning

Every growth forecast in Sections 3 through 6 of this report assigns AI-related investment a role in sustaining the 2027 recovery. None of those forecasts, on their own, describes what that investment actually requires in physical terms: land, water, grid capacity, and electricity, at a scale now large enough that governments, utilities, and investors treat it as a distinct economic variable rather than a detail of the technology sector. This section examines that physical reckoning directly, across four connected questions: how large the demand actually is, how the world's major regulatory jurisdictions are responding, why a comparatively neglected practice, retaining data nobody uses, carries its own environmental cost, and which efficiency technologies are closing part of the gap between demand and sustainable supply.

7.1 The Physical Scale of Demand

Research from Goldman Sachs, widely corroborated by independent sources, projects that US data center electricity demand will climb from 31 gigawatts in 2025 to 41 GW in 2026 and 66 GW in 2027, more than doubling in two years, based on an estimate that total US data center capacity will reach approximately 95 GW by the end of 2027.

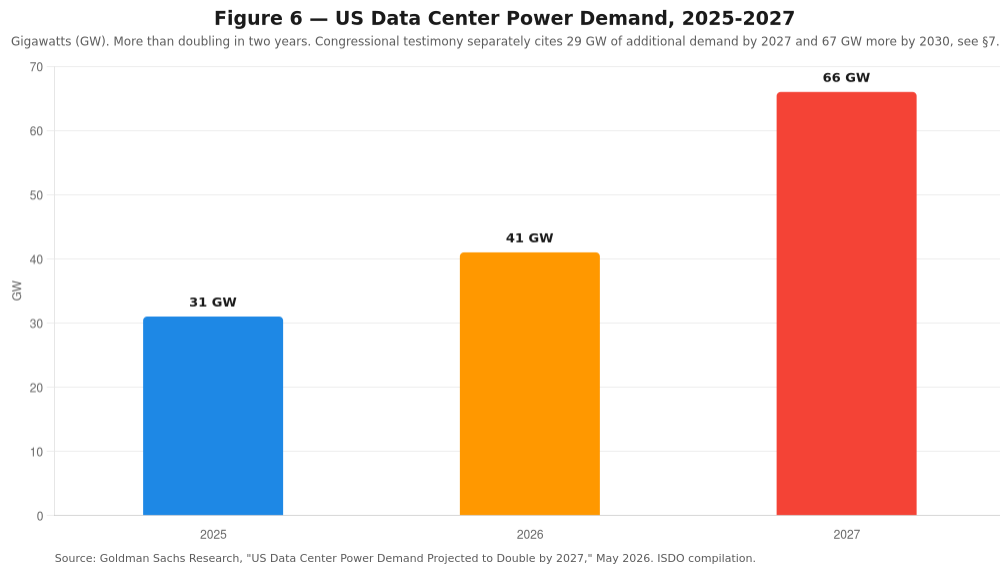


Figure 6: US data center power demand, 2025-2027. Source: Goldman Sachs Research, "US Data Center Power Demand Projected to Double by 2027," May 2026; ISDO compilation.

The consequence for the power system is concrete and quantified: data centers, which accounted for 4.1% of US summer peak demand in 2025, are projected to reach 8.5% in 2027, adding further strain to regional electricity markets already operating close to capacity limits. The International Energy Agency has noted that data centers absorbed roughly half of all US electricity demand growth in 2025, the single largest contributor to the country's power appetite.

This pattern is not confined to market-analyst estimates. Before the US Congress, former Google CEO Eric Schmidt has testified that data centers will need 29 GW of additional power by 2027, and 67 GW more by 2030. On the AI industry side, Anthropic has publicly estimated that training a single frontier model will

require 5 GW of power by 2027, and has projected that the US AI sector will need 50 GW of new electric capacity by 2028 to maintain global AI leadership, a figure roughly equivalent to twice New York City's peak electricity demand. Outside the United States, China's data center capacity is projected to top 60 GW by 2030; Section 7.2 examines not that capacity figure directly but the efficiency regime China has built around it, which this report's research found to be the more consequential finding.

7.2 The Global Legislative Response

No two of the jurisdictions examined in this report have converged on the same regulatory model for data center energy use, despite facing a structurally similar problem. The European Union has chosen mandatory disclosure without, so far, binding performance targets; Ireland and the Netherlands tie grid access or siting directly to renewable commitments or location; Singapore uses competitive entry; China sets tiered, mandatory efficiency ceilings backed by a rising renewable quota; and the United States, lacking a federal framework, has left the question to individual states.

Jurisdiction	Mechanism	Current status
European Union	Mandatory annual energy performance disclosure (PUE, WUE, Energy Reuse Factor, Renewable Energy Factor) for facilities ≥ 500 kW, under Energy Efficiency Directive Article 12.	Only 36% of estimated eligible facilities reported in the first period; most reporting facilities still miss their own PUE and WUE targets.
Ireland	Grid connection conditional on $\geq 80\%$ new, additional renewable capacity within six years, plus on-site generation or storage able to meet full demand.	Replaced a 2021-2025 de facto moratorium around Dublin; system operators published formal engagement processes by March 2026.
Netherlands	Hyperscale facilities (≥ 70 MW IT load) confined to a small number of designated sites in the north of the country.	An enduring siting restriction, not a time-limited pause; Amsterdam's own 2019 freeze was separately replaced by stricter efficiency rules.
Singapore	Competitive “call for applications” process; only facilities meeting efficiency and emissions criteria are approved.	Replaced an outright moratorium imposed in 2019; approvals remain selective rather than open.
China	Tiered mandatory PUE ceilings (1.2 in national computing hubs, 1.25 for new large/mega facilities) and a renewable-energy quota rising from 5% (2023) to 100% (2032).	National average PUE remains 1.49, above both tiers of target, based on the most recent reporting cited in this research.
United States	No federal standard; state-level rules focus on cost allocation and grid-impact assessment rather than renewable mandates.	Fragmented by state; New York and Texas have moved on disclosure and moratorium tools respectively, examined in this section.

Table 2: Data center energy regulation by jurisdiction, as of September 2026. Source: European Commission COM(2026) 500 final; Commission for Regulation of Utilities (Ireland); Philip Lee LLP; China NDRC reporting via Carbon Brief; see Annex A for full citations.

The European Commission's own September 2026 compliance report is the most directly verifiable data point in this table, and the most sobering. Of an estimated total of eligible EU data centers, only 770 reported in the first mandatory period, representing roughly 36% compliance; of those, 681 submitted PUE values the Commission judged reliable, and just 67 facilities reported any waste heat reuse at all. The Commission's own analysis states plainly that “most reporting data centres in the EU still exceed typical PUE targets” and that roughly half exceed the sector's own water-use benchmark. A mandatory disclosure regime, in its first year, has so far produced disclosure from barely a third of the facilities it covers.

Ireland's reversal illustrates a different lesson: a four-year moratorium, imposed in 2021 after data centers reached roughly 14% of the country's electricity use, did not resolve the underlying grid-capacity problem so much as freeze it, at a reported cost of tens of billions of euros in diverted investment, according to industry group Digital Infrastructure Ireland. The policy that replaced it in December 2025 does not reopen connections unconditionally; it replaces a blanket pause with a standing credibility test, 80% new renewable capacity, on-site backup capable of meeting full demand, and system-stability assessment per application, that in principle allows growth to resume without reproducing the grid strain that triggered the freeze in the first place. Singapore's 2019-to-present trajectory followed a similar arc, pause, then selective reopening, as did Amsterdam's within the Netherlands' broader siting-restriction model.

China's framework is the most centrally planned of the group and, on the Commission's own evidence from the EU case, the comparison worth drawing is not between China and the EU's ambition, both set broadly similar efficiency targets, but between China's and the EU's compliance gap. China's reported national average PUE of 1.49 sits well above both of its own mandatory tiers (1.2 for national computing hubs, 1.25 for new large and mega facilities), the same pattern of target-outrunning-outcome this report's macro sections document for emissions and growth forecasts alike.

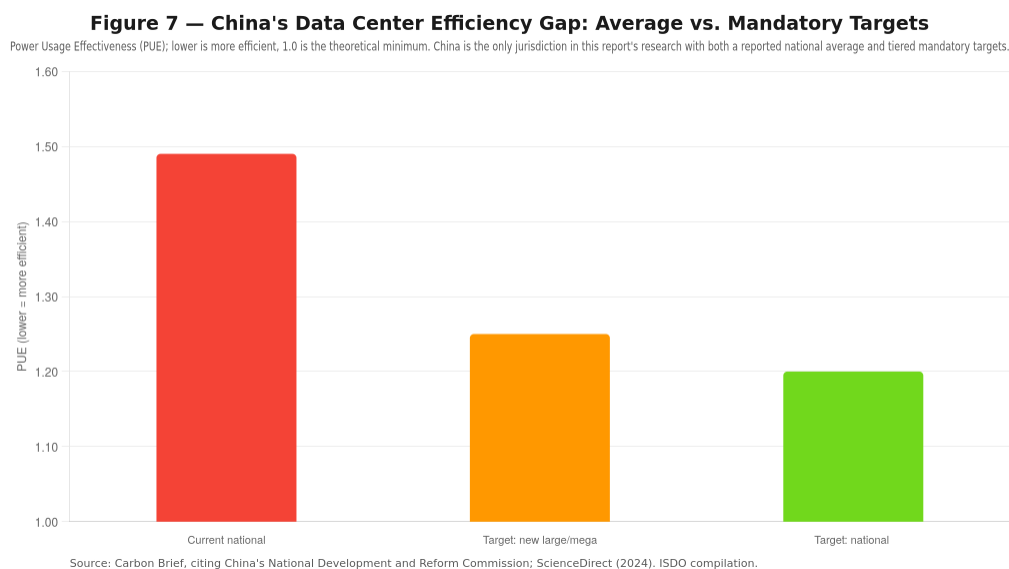


Figure 7: China's data center efficiency gap: national average versus mandatory targets. Source: Carbon Brief, citing China's National Development and Reform Commission; ScienceDirect (2024); ISDO compilation.

The efficiency gap in Figure 7 sits alongside a second, longer-dated mandate: a renewable-energy quota for government-procured data center capacity rising from 5% in 2023 to 100% by 2032, with 2027 falling almost exactly at the ramp's midpoint. Unlike the PUE targets, this quota has not yet faced the kind of public compliance audit the European Commission conducted for its own framework, so this report cannot say whether China's renewable procurement is tracking the schedule any better than its efficiency targets are.

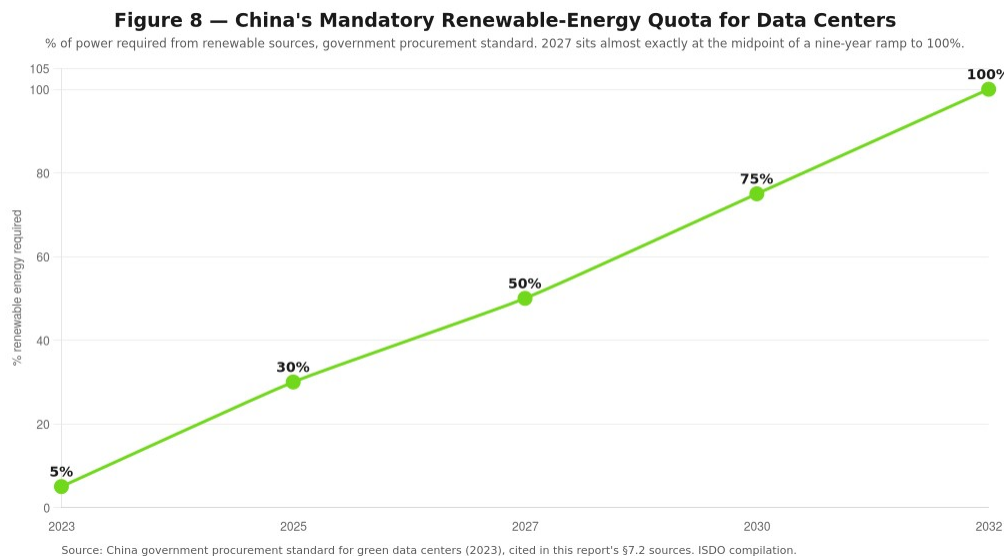


Figure 8: China's mandatory renewable-energy quota for data centers, 2023-2032. Source: China government procurement standard for green data centers (2023); ISDO compilation.

In the United States, the absence of a federal standard has pushed the regulatory question to the state level, where the tools in use look different from anywhere else in this table. New York imposed a one-year moratorium on new hyperscale data centers in July 2026 while developing statewide standards. Texas has taken a disclosure-first approach, requiring developers to report expected electricity and water use, cooling technology, public incentives received, and community-protection measures before receiving permits. Neither state ties approval to a renewable-energy quota the way Ireland or China do; both focus on cost allocation, who pays for the grid upgrades a new facility requires, and local impact, a framing that reflects US electricity markets' more decentralized, utility-by-utility structure rather than a difference in underlying environmental ambition.

7.3 The Dark Data Question

None of the regulatory models in Section 7.2, mandatory disclosure, renewable-linked access, siting restriction, competitive entry, or tiered efficiency targets, addresses a source of data center energy consumption that research presented through the OECD's own innovation platform estimates at close to two-thirds of enterprise data in storage: data that is collected, processed, and then never used again, commonly termed “dark data.”

The most directly institutional source this report located is a policy brief, “Why, Where and When Dark Data Affects Greenhouse Gas Emissions,” submitted by Loughborough University researchers Tom

Jackson and Ian Hodgkinson at the invitation of the International Advisory Group of the UK's Academy of Social Sciences. It places dark data's share of total data center storage at approximately 65%, and states that the data industry's emissions footprint exceeds the combined footprint of the automotive, aviation, and energy sectors, a sector-wide comparison broader than, and not directly reducible to, the data-center-specific GW figures in Section 7.1. The same researchers first presented this work, including a dark-data carbon calculator, at an OECD Observatory of Public Sector Innovation (OECD-OPSI) webinar on emerging technology trends, making OECD-OPSI the closest multilateral venue this report found for a topic otherwise covered by journalistic and corporate-sustainability sources rather than the regulatory-document-level sourcing Section 7.2 draws on.

Other estimates of dark data's scale and carbon cost vary by source and methodology, from roughly half of stored information to as much as 88% once genuinely redundant, obsolete, or trivial (“ROT”) material is included, with carbon-footprint figures ranging from approximately 5.8 to 6.4 million tonnes of CO₂ annually, roughly comparable to the national footprint of Cyprus. This report treats the Academy of Social Sciences brief's 65% figure as its primary reference point for that reason, institutional commissioning, not because the range itself resolves; nobody measuring this at scale claims precision, only that the number is large and persistent.

Why this gap persists

Jackson and Hodgkinson's policy brief states directly that bringing “digital decarbonisation to the forefront of sustainability policy” remains an open call rather than an enacted requirement. None of the six jurisdictions examined in Section 7.2 currently regulates it. Every disclosure regime this report documents measures what a data center consumes to operate; none measures what proportion of what it stores is, by the operator's own definition of usefulness, worth storing at all.

The scale problem compounds itself. The International Data Corporation projects total global data storage will grow from 33 zettabytes in 2018 to 175 zettabytes by 2025, a more than fivefold increase, meaning that even a constant dark-data percentage implies a rapidly rising absolute footprint. Practical responses exist and are documented in the corporate-sustainability literature, information lifecycle management, automated retention and deletion policies, migration of rarely accessed files to lower-energy “cold storage,” and deduplication, but adoption is reported as uneven and, unlike the PUE and renewable-sourcing metrics in Section 7.2, is not something any jurisdiction in this report's research currently requires companies to measure or disclose.

7.4 Toward More Efficient Infrastructure

Independent of what regulation requires, the data center industry is adopting efficiency technologies at a pace this report's research finds has accelerated specifically alongside AI-driven demand growth. Liquid cooling, direct-to-chip, immersion, and rear-door heat exchanger systems, is the most consequential of these: it transfers heat far more effectively than air, which has historically accounted for 40-50% of a data center's total energy consumption. A S&P Global survey of enterprise data center decision-makers found

21% planning to shift to liquid cooling within a year, up from 13% in a comparable 2024 survey, with another 25% planning the switch within two to four years.

Heat reuse is the second major lever, and moves the efficiency question from reducing waste to monetizing it. Finland's LUMI supercomputer integrates its liquid cooling loop directly into the district heating network of Kajaani, warming thousands of local homes with heat that would otherwise be vented. Qarnot Computing, a French firm, has taken the concept further still, installing distributed computing nodes directly inside residential buildings, functioning as electric radiators that simultaneously perform computation and heat the building, an approach its own figures describe as achieving close to full energy efficiency by eliminating the separate cooling step most data centers require. The EU's own regulatory trajectory is beginning to formalize this: waste-heat reuse requirements of 10-20% are expected to phase in by 2026-2028 under the broader Energy Efficiency Directive framework examined in Section 7.2, though the Commission's own compliance data, just 67 facilities reporting any reuse in the first period, shows how early that trajectory still is in practice.

China's underwater data center pilot in Shanghai, completed using offshore wind power, illustrates a third approach, using the operating environment itself to reduce cooling load, with a reported PUE of 1.15 in its first phase, below even the country's own strictest mandatory tier documented in Figure 7. None of these technologies resolves the demand-growth trajectory in Figure 6 on its own; together, they represent the clearest evidence this report's research found that the gap between AI's energy appetite and the system's ability to meet it sustainably is being addressed from the supply and efficiency side even where Section 7.2's regulatory picture has not yet caught up.

8. Other Risk Factors for 2027

Beyond the AI infrastructure questions examined at length in Section 7, the sources consulted for this report converge on a small, stable set of additional risks, despite coming from institutions with different mandates and methodologies. That convergence, even where central growth figures diverge, is itself a signal of which factors deserve closer attention heading into 2027.

Risk	Description
Public debt sustainability	Elevated public debt, defense spending, and aging-population costs narrow the fiscal room available for a fresh shock, according to the IMF and OECD.
Evolution of the Middle East conflict	A ceasefire in April 2026 did not hold; energy prices resurged by September. Developed in Section 8.2, with implications for the IMF-OECD divergence in Section 3.
Trade fragmentation	Despite resilience against the 2025 tariffs, the IMF lists escalating trade tensions as an explicit downside risk for 2027.
Reassessment of AI productivity gains	Distinct from market-valuation risk: the IMF itself cautions that AI's real productivity gains could prove smaller than current growth models assume.

Table 3: Risk factors for 2027 beyond AI infrastructure, cited by multiple institutional sources. Source: ISDO compilation from the sources cited in Annex A.

On the specific case of US public debt, the Congressional Budget Office's own 2026 baseline, the most current and most directly authoritative figure available, projects federal debt held by the public reaching 110% of GDP by 2031 and 120% by 2036, both above the prior post-war historical high of 106% set in 1946. A September 2026 UBS Asset Management briefing on emerging-market allocation independently names the same cluster of risks this report documents, dollar strength, the Middle East conflict, and a possible slowdown in AI investment, as the main headwinds it sees facing emerging markets specifically, a fifth independent source converging on largely the same list Table 3 already reflects.

8.1 AI Valuation Risk: A Market-Level Parallel to Section 7

Distinct from the physical infrastructure question in Section 7 is a financial one: whether current equity valuations assume AI-driven productivity and revenue growth that fails to materialize at the pace priced in. The OECD and Allianz Research both flag this explicitly as a 2027 risk. The clearest evidence of this risk already partly crystallizing sits outside the macro institutions entirely, in the sharp repricing of public software-as-a-service (SaaS) companies. Median SaaS valuation multiples, measured against annual recurring revenue, peaked at 16.9x in August 2021, fell to 7.5x within a year as rate-driven repricing hit growth equities broadly, stabilized in a 6x-7x range through 2023 and 2025, then fell again to 3.2x by June 2026, the lowest point in the five-year series, per data from the SaaS Capital Index.

That second decline is the one this report connects to Section 7: it coincides with a market-wide bifurcation between software companies investors perceive as beneficiaries of generative AI and those perceived as vulnerable to AI-native substitution, a distinction UBS Asset Management's own sector analysis identifies

as the dominant pricing factor behind the 2025-to-2026 compression specifically, and one that did not exist as a pricing consideration in 2021. Mid-cap SaaS companies, lacking the scale advantages of incumbents such as Microsoft, Salesforce, or Adobe, are the segment most exposed to it.

8.2 The Middle East Conflict: A Ceasefire That Did Not Hold

The energy shock this report treats as a single ongoing event was not, in fact, continuous. A ceasefire took effect on April 8, 2026, and by late June, Brent crude had fallen back to pre-war levels, around \$72 a barrel, with the US Energy Secretary stating that flows through the Strait of Hormuz had returned close to their pre-war volume. That recovery did not hold. Renewed attacks on shipping and energy infrastructure through the third quarter reversed the gains, and by early September 2026, Brent had surged to roughly \$109 a barrel, more than 50% above the pre-war benchmark.

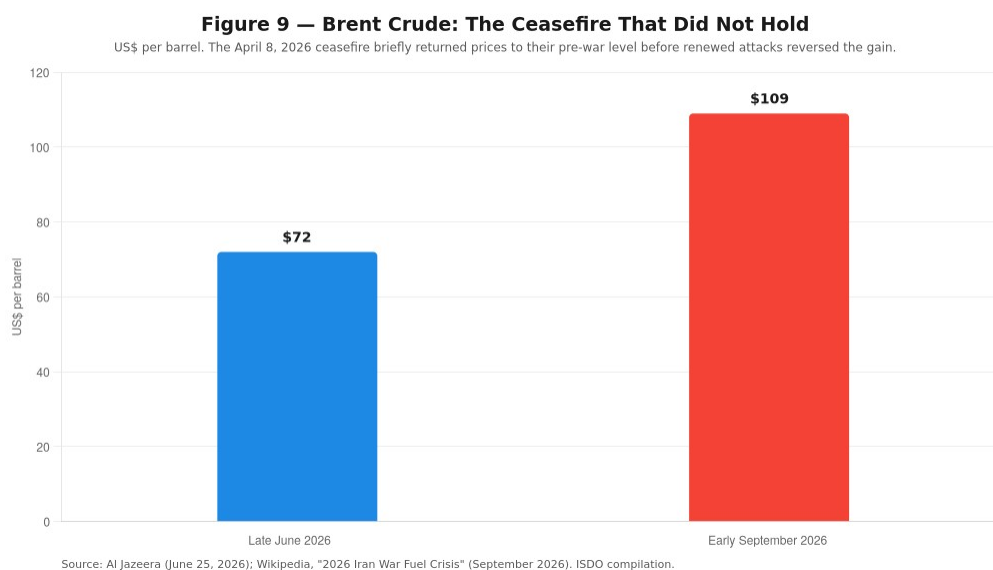


Figure 9: Brent crude, ceasefire low versus reescalation high. Source: Al Jazeera, June 25, 2026; Wikipedia, "2026 Iran War Fuel Crisis," September 2026.

Precious metals markets show a consistent signal. Gold futures settled near \$4,190 a troy ounce and silver near \$60 on September 30, 2026, levels that keep both metals in territory usually associated with sustained safe-haven demand. This report draws no independent conclusion from that pricing alone, metals markets move on more than geopolitical risk, but it is consistent with the reescalation documented above rather than contradicting it.

This pattern matters for how a reader should weight the scenario divergence documented in Section 3. The OECD's "time-limited disruption" and "prolonged disruption" scenarios were published in June 2026, in the window when the ceasefire appeared to be holding and prices had normalized; the September reescalation this section documents happened after that publication. Neither the IMF's July update nor the OECD's June Outlook could have fully priced in a conflict that resumes after a ceasefire, which is a reasonable caution for a reader placing confidence in either institution's central 2027 case.

9. Conclusions and Considerations

Four conclusions follow from this report's two lines of inquiry taken together. First, the global economy of 2027 will, with high probability according to every source consulted, be an economy in relative recovery from 2026, but the magnitude of that recovery remains genuinely contested among first-tier institutions. Second, the 2026 monetary policy cycle has demonstrated a capacity for faster revision than central banks' usual communication would suggest. Third, much of today's uncertainty, the evolution of the Middle East conflict, is exogenous to the economic models the cited institutions rely on. Fourth, and new to this edition: the AI investment sustaining the growth forecast in Sections 3 through 6 has a physical signature, documented in Section 7, that no single regulatory regime currently manages end to end, from raw demand, through siting and energy sourcing, to the unaddressed question of waste in the data that infrastructure stores.

9.1 For Economic Policymakers

The divergence between the “time-limited” and “prolonged” scenarios the OECD itself quantifies in Section 3 offers a useful framework well beyond that institution. A parallel lesson applies to Section 7: the European Commission's own finding that only 36% of eligible facilities complied with a mandatory disclosure regime in its first year suggests that reporting obligations alone, without either incentive or enforcement, may understate how large a compliance gap any future binding target would need to close.

9.2 For Analysts and Investors

The Federal Reserve's reversal documented in Section 5 is the most consequential monetary policy development of 2026. A parallel discipline applies to AI infrastructure exposure: the gigawatt figures in Section 7.1 and the SaaS valuation compression noted in Section 8.1 are, on this report's reading, two measurements of the same underlying repricing, one physical, one financial, and a reader who tracks only one is missing half the signal.

9.3 For Researchers and Civil Society

This report was deliberately built as a comparison across sources, not as a synthesis that papers over disagreement between them, a discipline Section 7 extends from growth forecasts to regulatory models: six jurisdictions, six different answers to the same physical problem, with no claim here about which will prove most effective. The dark data question in Section 7.3 is, on the evidence this report found, the clearest current gap in that regulatory landscape, measured by multiple independent sources but addressed by none of the frameworks in Table 2.

Annex A: Bibliography

All sources cited in this report were publicly available as of the research date, October 2026.

International Monetary Fund

International Monetary Fund (2026, July). World Economic Outlook Update, July 2026: Global Economy in Crosscurrents of War and Technology. <https://www.imf.org/en/publications/weo/issues/2026/07/08/world-economic-outlook-update-july-2026>

International Monetary Fund (2026, April). World Economic Outlook, April 2026: Global Economy in the Shadow of War. <https://www.imf.org/en/publications/weo/issues/2026/04/14/world-economic-outlook-april-2026>

International Monetary Fund (2026, January). World Economic Outlook Update, January 2026: Global Economy: Steady amid Divergent Forces. <https://www.imf.org/en/publications/weo/issues/2026/01/19/world-economic-outlook-update-january-2026>

MercoPress (2026, January 19). IMF Keeps Argentina's Growth Outlook at 4% for 2026 and 2027 Amid Fragile Global Balance. <https://en.mercopress.com/2026/01/19/imf-keeps-argentina-s-growth-outlook-at-4-for-2026-and-2027-amid-fragile-global-balance>

Hürriyet Daily News (2026, July). IMF Expects Turkish GDP to Grow 2.9 Percent in 2026. <https://www.hurriyetdailynews.com/imf-expects-turkish-gdp-to-grow-2-9-percent-in-2026-224177>

Trend.az (2026, July 22). IMF Cuts Türkiye's 2026 Growth Forecast, Sees Rebound in 2027. <https://www.trend.az/business/4208952.html>

OECD and World Bank

OECD (2026, June). OECD Economic Outlook, Volume 2026 Issue 1: Testing Resilience. https://www.oecd.org/en/publications/oecd-economic-outlook-volume-2026-issue-1_2d1956f0-en.html

OECD (2026, March). OECD Economic Outlook, Interim Report March 2026. https://www.oecd.org/en/publications/2026/03/oecd-economic-outlook-interim-report-march-2026_254a8d56.html

World Bank (2026, July). Global Economic Prospects. <https://www.worldbank.org/en/publication/global-economic-prospects>

Central Banks

Federal Reserve (2026, September). Summary of Economic Projections, September 16, 2026.

Raisin (2026, September). Fed Dot Plot Analysis September 2026: 2027 Interest Rate Forecast. <https://www.raisin.com/en-us/news/fed-decision-dot-plot-breakdown-september-2026/>

CNBC (2025, December 10). Fed's Dot Plot Shows One Rate Cut for Next Year. <https://www.cnn.com/2025/12/10/feds-dot-plot-shows-one-rate-cut-for-next-year.html>

Private-Sector Analysis and Risk Corroboration

EY-Parthenon (2026, July). Midyear Global Economic Outlook: Risk and Opportunity in a Supply Shock World. https://www.ey.com/en_us/insights/strategy/global-economic-outlook

Allianz Research (2025, December). Economic Outlook 2026-27: Stretching the Limits. https://www.allianz.com/en/economic_research/insights/publications/specials_fmo/251217-economic-outlook-2026-27.html

Congressional Budget Office (2026). The Budget and Economic Outlook: 2026 to 2036. <https://www.cbo.gov/publication/62105>

UBS Asset Management (2026, October 1). Emerging Markets: Rethinking Allocations to Equities and Fixed Income. <https://www.ubs.com/global/en/assetmanagement/insights/investment-outlook/articles/rethinking-allocations.html>

Associated Press, via Yahoo Finance (2026, September 30). Gold and Silver Futures Settlement Prices, NY Mercantile Exchange. <https://finance.yahoo.com/markets/commodities/articles/bc-gold-silver-190015273.html>

AI Valuation Risk (§8.1)

UBS Asset Management (2026, September). AI, Dilution and the Search for Sustainable Value: Why Stock-Based Compensation Has Become a Critical Stewardship Issue in US Software.

The SaaS Capital Index (2026, July). Public SaaS Company Valuation Data, data as of end July 2026. <https://www.saascapital.com/saas-valuations>

The Middle East Conflict: Ceasefire and Reescalation

Al Jazeera (2026, June 25). Oil Prices Back to Pre-War Levels on Rising Middle East Supply. <https://www.aljazeera.com/news/2026/6/25/oil-prices-back-to-pre-war-levels-on-rising-middle-east-supply>

Wikipedia (2026, September). 2026 Iran War Fuel Crisis. https://en.wikipedia.org/wiki/2026_Iran_war_fuel_crisis

World Bank (2026, April 28). Commodity Markets Outlook, April 2026. <https://www.worldbank.org/en/news/press-release/2026/04/28/commodity-markets-outlook-april-2026-press-release>

AI Infrastructure: Demand (§7.1)

Goldman Sachs Research (2026, May). US Data Center Power Demand Projected to Double by 2027. <https://www.goldmansachs.com/insights/articles/us-data-center-power-demand-projected-to-double-by-2027>

American Public Power Association (2026, June). U.S. Data Center Power Demand Expected to Climb to 41 GW in 2026: Goldman Sachs. <https://www.publicpower.org/periodical/article/us-data-center-power-demand-expected-climb-41-gw-2026-goldman-sachs>

Brookings Institution (2026, June). Global Energy Demands Within the AI Regulatory Landscape. <https://www.brookings.edu/articles/global-energy-demands-within-the-ai-regulatory-landscape/>

World Resources Institute (2025, September). Powering the US Data Center Boom: The Challenge of Forecasting Electricity Needs. <https://www.wri.org/insights/us-data-centers-electricity-demand>

Rystad Energy (2026). China's Data Center Capacity Set to Top 60 GW by 2030, Driving a Doubling of Power Demand. <https://www.rystadenergy.com/news/chinas-data-center-capacity-doubling-of-power>

AI Infrastructure: Global Legislation (§7.2)

European Commission (2026, September 21). COM(2026) 500 Final: Report on the Application of the Energy Efficiency Directive to Data Centres. https://energy.ec.europa.eu/document/download/8a87a5fe-0260-462a-b165-09f1496d1aa0_en

White & Case (2026). Data Centres and Energy Consumption: Evolving EU Regulatory Landscape and Outlook for 2026. <https://www.whitecase.com/insight-alert/data-centres-and-energy-consumption-evolving-eu-regulatory-landscape-and-outlook-2026>

Osborne Clarke (2026). Sustainable Data Centre Development in the EU: Added Value or Legal Requirement? <https://www.osborneclarke.com/insights/sustainable-data-centre-development-eu-added-value-or-legal-requirement>

Philip Lee LLP (2025). Re-Balancing the Digital Bargain: Ireland's New CRU Large Energy User Connection Policy. <https://www.philiplee.ie/re-balancing-the-digital-bargain-irelands-new-cru-large-energy-user-connection-policy/>

William Fry (2026). Ireland's Data Centre Connections: Back Online. <https://www.williamfry.com/knowledge/irelands-data-centre-connections-back-online/>

Bloomberg, via Energy Connects (2025, December). Ireland Ends Moratorium on New Power Links to Data Centers. <https://www.energyconnects.com/news/utilities/2025/december/ireland-ends-moratorium-on-new-power-links-to-data-centers/>

Environment+Energy Leader (2026). Ireland's Grid Now Asks Which Data Centers Are Credible. <https://www.environmentenergyleader.com/stories/irelands-grid-now-asks-which-data-centers-are-credible.133727>

Carbon Brief (2026). Explainer: How China Is Managing the Rising Energy Demand From Data Centres. <https://www.carbonbrief.org/explainer-how-china-is-managing-the-rising-energy-demand-from-data-centres>

Forrester (2026, September). Predictions 2027: AI Slingshots Environmental Sustainability From Promises to Action. <https://www.forrester.com/blogs/predictions-2027-ai-slingshots-environmental-sustainability-from-promises-to-action/>

AI Infrastructure: Dark Data (§7.3)

Jackson, T. and Hodgkinson, I. (2024). Why, Where and When Dark Data Affects Greenhouse Gas Emissions. Policy brief for the International Advisory Group, Academy of Social Sciences. Loughborough University. <https://acss.org.uk/publications/why-where-and-when-dark-data-affects-greenhouse-gas-emissions/>

OECD Observatory of Public Sector Innovation (2023, April 6). On Track for 6.8 Billion Years of Continuous Movie Streaming: Data, Energy and the Need for Digital Decarbonisation. <https://oecd-opsi.org/blog/category/emerging-tech/>

Loughborough University (2024). Loughborough Experts Shine a Light on the Climate Change Impact of Dark Data. <https://www.lboro.ac.uk/schools/business-school/news/2024/climate-change-impact-of-dark-data/>

The Conversation (2026). Data That Is Stored and Not Used Has a Carbon Footprint: How Companies Can Manage Dark Data Better. <https://theconversation.com/data-that-is-stored-and-not-used-has-a-carbon-footprint-how-companies-can-manage-dark-data-better-262966>

World Economic Forum (2024). What Is 'Dark Data' and How Is It Adding to All of Our Carbon Footprints? <https://www.weforum.org/stories/2022/10/dark-data-is-killing-the-planet-we-need-digital-decarbonisation/>

AI Infrastructure: Efficiency (§7.4)

S&P Global (2026). 2026 Trends in Data Center Services & Infrastructure. <https://www.spglobal.com/energy/en/technology-ai-research-insights/special-reports/2026-trends-in-data-center-services-infrastructure>

CoolIT Systems (2026). Data Center Cooling Trends to Watch in 2026 and Beyond. <https://www.coolitsystems.com/resources/news/data-center-cooling-trends/>

Xinhua (2025, October 21). China Focus: China Completes World's First Wind-Powered Underwater Data Center. <https://english.news.cn/20251021/0a21a82fbcc547369244bd3662be7cbd/c.html>

Annex B: Glossary

Term	Definition
Headline inflation	The total, unadjusted rate of price change across the full consumer basket, including volatile categories such as energy and fresh food.
Core inflation	Inflation excluding energy and fresh food prices, used by central banks as a better guide to underlying, persistent price pressure.
Terminal rate	The level at which a central bank expects its policy interest rate to settle at the end of a hiking or cutting cycle.
Summary of Economic Projections (SEP)	The Federal Reserve's quarterly release of individual policymakers' forecasts for growth, inflation, unemployment, and the federal funds rate.

Term	Definition
G20	The Group of Twenty, a forum of the world's major advanced and emerging economies whose aggregate inflation and growth figures are used in Section 4 as a broader benchmark than any single country.
PUE (Power Usage Effectiveness)	The ratio of a data center's total energy consumption to the energy consumed by its IT equipment alone. A PUE of 1.0 is the theoretical minimum; lower values indicate greater efficiency.
WUE (Water Usage Effectiveness)	The ratio of a data center's annual water consumption to the energy consumption of its IT equipment, used alongside PUE under the EU's reporting framework.
Dark data	Data that an organization collects, processes, and stores but never subsequently uses for any business purpose, discussed in Section 7.3.
ROT data	Redundant, Obsolete, or Trivial data, a stricter subcategory of dark data with no remaining business value under any plausible use case.

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