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AI Protectionism, Energy and Semiconductors: US/Europe Divergence Trajectories 2024–2030

Integrated Geostrategic and Economic Analysis

Chapter V

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75% global AI compute = USA $675B US capex 2026   7-12× US/EU ratio

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7 chapters • 4 prospective scenarios • 3 geographic zones

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CHAPTER V

Prospective Scenarios 2026–2030

This chapter constitutes the core of this study's original contribution. By applying the methodological protocol defined in Chapter II (2×2 matrix, six divergence metrics, CACI calibration), we construct four scenarios for the evolution of the transatlantic relationship in AI, energy, and semiconductors for the 2026–2030 period. Each scenario is determined by the combination of two critical uncertainties identified in Chapter III: the degree of American protectionism and the capacity for European strategic response. We then evaluate each scenario on its six metrics, before synthesizing the tipping conditions between trajectories.

5.1 Predetermined Elements: What Will Not Change

In accordance with the Schwartz method (1991), we distinguish predetermined elements (near-certain trends by the 2030 horizon) from critical uncertainties (factors whose evolution depends on political decisions not yet made). Four predetermined elements structure all scenarios.

PE1 — Exponential growth of AI compute demand. Semiconductor sales doubled in two years (2023–2025), installed AI chip power doubles every seven months (Epoch AI), and no sign of slowdown is observable as of February 2026. Even under the hypothesis of scaling law deceleration ("Chinchilla saturation"), the diffusion of AI toward inference, robotics, and autonomous agents will maintain strongly rising compute demand.[1]

PE2 — Persistent concentration of compute in the United States. The US/EU ratio of 15:1 in installed compute (Chapter III) reflects investment decisions made in 2022–2025, whose effects materialize through 2028–2029 (data center construction timelines: 18–36 months). Even an immediate policy reversal would not alter the installed stock before the end of the decade.

PE3 — Growing energy tension. Global data center consumption, estimated at 415 TWh in 2024, will reach 800–950 TWh by 2030 according to IEA projections (Chapter III). The asymmetry in energy costs (US 2–3× cheaper than the EU) will persist, barring massive investment in European nuclear power — whose deployment timelines (SMR: 5–7 years for initial reactors) extend beyond the 2030 horizon.[2]

PE4 — Section 232 regulatory framework in place. Proclamation 11002 of January 14, 2026 is a legal fait accompli. Unlike IEEPA tariffs (struck down by the Supreme Court on February 20, 2026[3]), Section 232 tariffs rest on a confirmed legal basis. The Secretary of Commerce's report on the semiconductor market for data centers is expected by July 1, 2026, and may recommend an expansion or modification of tariffs. Regardless of the direction taken, the legal instrument will remain available.[4]

5.2 Critical Uncertainties and the 2×2 Matrix

5.2.1 Axis 1: Degree of American Protectionism

The first uncertainty concerns the evolution of American policy between two poles. The “moderate” pole corresponds to maintaining the January 2026 status quo: 25% tariff limited to re-exported advanced chips, broad domestic exemptions, EU trade agreement capping semiconductor tariffs at 15%, and no significant extension to cloud or models. The EU “core” (France, Germany) remains in the trusted partner category. The “aggressive” pole assumes an expansion after the July 2026 report: tariffs extended to derivative semiconductors and equipment, GPU quotas for the EU (including France), restrictive conditions for access to cutting-edge AI cloud, and use of compute as a trade negotiation lever (“compute-for-concessions”).[5]

5.2.2 Axis 2: European Strategic Response Capacity

The second uncertainty concerns the EU’s ability to deploy a coherent and rapid response. The “reactive” pole corresponds to fragmented national responses, dispersed investments, an AI Act creating additional compliance costs, and slow deployment of AI Factories/Gigafactories (bureaucratic delays, 24+ month permitting). The “proactive” pole assumes accelerated implementation of the AI Continent program (19 AI Factories + up to 5 Gigafactories of 100,000+ GPUs), adoption of Special Compute Zones (180-day permitting), effective mobilization of the InvestAI fund (€20 billion), and pooling of French nuclear capacity as a competitive advantage.[6]

5.2.3 Matrix and Scenario Naming

The intersection of these two axes produces four scenarios:

	Reactive EU Response	Proactive EU Response
Moderate US Protectionism	**Scenario A** “Reinforced Status Quo” Slow drift toward dependency	**Scenario C** “Asymmetric Partnership” Western tech junior partner
Aggressive US Protectionism	**Scenario B** “Digital Fracture” Structural European decoupling	**Scenario D** “Contested Sovereignty” Autonomy race under pressure

Table 10. 2×2 matrix of prospective scenarios 2026–2030. Source: author’s construction, Schwartz (1991) methodology.

5.3 Scenario A — “Reinforced Status Quo” (Moderate Protectionism + Reactive EU)

5.3.1 Narrative

After the July 2026 report, the Secretary of Commerce recommends maintaining the 25% tariff on re-exported advanced chips but not extending it significantly. The August 2025 US-EU trade agreement is respected: semiconductor tariffs for the EU remain capped at 15%.[7] The EU, reassured by this status quo, slows the deployment of its own initiatives. EuroHPC AI Factories struggle to reach their nominal capacity (permitting delays, inter-state coordination). Gigafactories are pushed back to 2029–2030. The InvestAI fund is partially mobilized (€8–10 billion out of 20). European companies continue to rely heavily on US cloud, whose performance and costs remain unbeatable.

5.3.2 Metrics Trajectory

M1 — Compute ratio (installed GPUs US/EU): increases from 15:1 (2025) to 18–20:1 (2030). The gap widens slightly as US investments accelerate (Stargate, xAI mega-clusters, Meta) while the EU adds only the 19 AI Factories (25,000 GPUs max each, i.e., ~475,000 public GPUs, an order of magnitude below a single US hyperscaler).[8]

M2 — FLOP cost gap (EU/US): remains in the 2.4–3.2× range. The absence of aggressive tariffs on the EU maintains access to US cloud at prices close to current levels, but European energy costs continue to weigh.

M3 — US cloud share in European AI spending: increases from 70% (2024) to 72–75% (2030). European providers (OVHcloud, Deutsche Telekom) maintain their 15% share on the sovereignty segment but do not gain ground on generative AI services.

M4 — AI productivity (%/year): US: +2.5–3.0%; EU: +1.0–1.5%. The EU realizes part of the AI potential through downstream applications (SAP, Siemens, fintech), but slow adoption and the compute deficit cap gains.

M5 — Energy dependency (TWh data centers): EU: ~115 TWh (2030, i.e., +65% vs 2024). French nuclear energy absorbs part of the demand, but the absence of Special Compute Zones delays the connection of new data centers to the grid.

M6 — CACI(US)/CACI(EU): increases from 7–12:1 (2025) to 10–15:1 (2030). The gap widens moderately as the C(r) (compute) factor increases on the US side while energy costs E(r) weigh on the EU side.

5.3.3 Consequences for France

This scenario is the most likely in the short term (estimated probability: 40–50%). It is also the most insidious: the absence of a visible shock demobilizes European actors, while dependency deepens structurally. French companies benefit from access to US cloud for AI adoption (BNP Paribas, Airbus, TotalEnergies via AWS/Azure), but this adoption reinforces the lock-in described in Chapter IV. The AI productivity deficit relative to the United States (−1.0 to −1.5 points per year) accumulates over five years, widening the competitiveness gap by 5 to 8 GDP points.

5.4 Scenario B — “Digital Fracture” (Aggressive Protectionism + Reactive EU)

5.4.1 Narrative

The July 2026 report leads to a significant expansion. The Secretary of Commerce recommends tariffs extended to semiconductor equipment and derivative products, with a tariff offset program reserved for companies investing in American production.[9] The EU’s 15% agreement is revised upward, or accompanied by restrictive conditions (volume quotas on advanced GPUs, reciprocity requirements on the AI Act). Simultaneously, access to cutting-edge AI cloud is made conditional for non-American entities (limitations on API access to frontier models, restrictions on weights). The EU, fragmented, fails to formulate a coherent response: member states split between accommodation (Nordic countries, Netherlands) and confrontation (France, Italy).

5.4.2 Metrics Trajectory

M1 — Compute ratio: increases from 15:1 to 25–30:1 (2030). GPU quotas limit European imports at the moment when demand explodes. AI Factory projects are compromised by the inability to procure Nvidia/AMD GPUs at planned volumes.

M2 — FLOP cost gap: jumps to 4–6×. Expanded tariffs, combined with quotas and energy asymmetry, massively increase European compute costs. French companies face a 3× to 5× surcharge for model training.

M3 — US cloud share: paradoxically, rises to 78–82%. Lacking a credible local alternative, European companies wanting access to cutting-edge AI must go through US hyperscalers, at whatever pricing terms they dictate. Sovereign services (OVHcloud, Scaleway) lack the hardware to offer competitive GenAI services.

M4 — AI productivity: US: +2.5–3.5%; EU: +0.3–0.8%. European AI potential is severely constrained. The McKinsey Global Institute estimates that with slow adoption, European productivity would not exceed 0.3% — close to stagnation.[10]

M5 — Energy dependency: EU: ~95 TWh only (2030), not by virtue but by default — the lack of GPUs limits data center construction. Ironically, the compute constraint attenuates the energy constraint.

M6 — CACI ratio: explodes to 20–35:1 (2030). This is the scenario where the gap is largest, with all three CACI factors deteriorating simultaneously on the European side: C(r) capped by quotas, E(r) inflated by tariffs, L(r) weakened by accelerated brain drain to the United States.

5.4.3 Consequences for France

This scenario (estimated probability: 15–20%) represents the worst case. France suffers a structural technological decoupling: compute-intensive projects (Mistral foundation models, Comau/Exotec robotics, Dassault simulations) are relocated to the United States or dependent on increasingly costly US cloud access. The time-to-market of French AI solutions extends by 25 to 40%. Industrial SMEs, unable to absorb the surcharges, forgo cutting-edge AI and opt for degraded solutions (smaller open-source models, local inference). The cumulative productivity gap with the United States reaches 10 to 15 points over five years.

5.5 Scenario C — “Asymmetric Partnership” (Moderate Protectionism + Proactive EU)

5.5.1 Narrative

US protectionism remains moderate (as in A), but the EU exploits this window to accelerate its own investments. AI Factories are deployed on schedule (2026–2027), the first Gigafactories of 100,000+ GPUs are ordered in late 2026 and delivered in 2028.[11] France plays a central role thanks to its nuclear fleet (65–70% of the electricity mix, competitive marginal cost), and Special Compute Zones are designated on former industrial sites with heavy grid connections.[12] However, the EU accepts de facto a junior technological partner status: it uses Nvidia/AMD GPUs (no European champion in AI ASIC design), depends on TSMC/Samsung/Intel foundries for production, and its foundation models remain one step below US leaders.

5.5.2 Metrics Trajectory

M1 — Compute ratio: decreases from 15:1 (2025) to 8–10:1 (2030). Gigafactories and private investment (InvestAI + industrial co-investments) add 1–2 million GPU equivalents in Europe, reducing the gap without closing it.

M2 — FLOP cost gap: decreases to 1.5–2.0×. French nuclear and Gigafactory economies of scale compress energy and infrastructure costs, although a residual gap persists (absence of proprietary GPU design).

M3 — US cloud share: decreases slightly to 60–65%. European sovereign services gain market share on regulated segments (defense, healthcare, finance), while US cloud retains the majority of commercial workloads. The market segments into “sovereign” and “performance.”

M4 — AI productivity: US: +2.5–3.0%; EU: +1.8–2.5%. The EU reaches 60–80% of theoretical potential thanks to sufficient local compute for large-scale adoption of downstream applications, even though frontier model training remains dependent on US hardware.

M5 — Energy: EU: ~140 TWh (2030). Demand is higher than in A because European compute increases, but nuclear and planned SMRs absorb the bulk. RTE France confirms the feasibility of +10 GW subject to grid investments.

M6 — CACI ratio: decreases to 4–7:1 (2030). This is the most favorable scenario realistically achievable by the 2030 horizon. The C(r) factor improves significantly, E(r) benefits from nuclear, but L(r) remains slightly lower (US AI ecosystem more attractive for top talent).

5.5.3 Consequences for France

This scenario (estimated probability: 15–20%) is the most favorable for France in the short-to-medium term. France becomes the EU’s AI energy hub thanks to its nuclear fleet, attracting data center and Gigafactory investments. French companies gain access to competitive local compute for inference and fine-tuning, reducing dependency on US cloud for standard use cases. Mistral and French startups can train specialized models locally. However, frontier model training remains dependent on US hardware, and strategic autonomy is partial: France is sovereign in application, but not in the creation of foundational technologies.

5.6 Scenario D — “Contested Sovereignty” (Aggressive Protectionism + Proactive EU)

5.6.1 Narrative

US protectionism intensifies (as in B), but the EU responds with determination. The American threat becomes the political catalyst for an unprecedented European industrial mobilization since the AIRBUS project of the 1970s. The AI Continent program is accelerated and expanded: the 5 Gigafactories are urgently ordered, France announces 20 GW of nuclear capacity dedicated to AI data centers by 2032 (combining extension of the existing fleet and SMRs), the DARE project (European RISC-V) is escalated to design AI accelerators reducing dependency on Nvidia.[13] Simultaneously, the EU negotiates alternative technology alliances (Japan, South Korea, Taiwan) to secure GPU and foundry supply.

5.6.2 Metrics Trajectory

M1 — Compute ratio: evolves from 15:1 (2025) to 10–15:1 (2030). The EU invests massively but starts from very far behind. US quotas slow imports, but alternative alliances and local production (Gigafactories using Samsung/Intel GPUs as Nvidia alternatives) partially compensate.

M2 — FLOP cost gap: 2.5–4.0× initially (2027, peak of the tariff shock), then progressive reduction toward 1.8–2.5× (2030) as Gigafactories ramp up and GPU alternatives mature.

M3 — US cloud share: decreases to 50–55% (2030), the most pronounced decline of the four scenarios. Geopolitical distrust and US restrictions push European companies toward sovereign alternatives, even imperfect ones. US hyperscalers lose ground on regulated segments.

M4 — AI productivity: US: +2.5–3.5%; EU: +1.2–2.0%. The EU experiences a productivity trough in 2027–2028 (transition period when US restrictions bite but European investments are not yet operational), then a partial catch-up from 2029 onward.

M5 — Energy: EU: ~150–160 TWh (2030). This is the most energy-intensive scenario for the EU, as massive local data center construction creates enormous demand. French nuclear becomes a continental strategic asset, but grid pressure is at its maximum.

M6 — CACI ratio: follows a U-shaped trajectory: degradation to 15–20:1 in 2027–2028 (shock), then improvement toward 8–12:1 by 2030. The outcome depends heavily on European execution speed: every year of delay in Gigafactories extends the period of maximum vulnerability.

5.6.3 Consequences for France

This scenario (estimated probability: 15–20%) is the most ambitious and the riskiest. It places France at the heart of an unprecedented European technological sovereignty effort. Massive nuclear investments (SMR, fleet extension) become a first-order geopolitical issue. The DARE/RISC-V project could, if successful, constitute the first credible European alternative to Nvidia GPUs for AI — but on a 5–7 year horizon, well beyond 2030. In the short term (2026–2028), France traverses a period of maximum vulnerability where surcharges and shortages degrade competitiveness, before a catch-up conditional on infrastructure deployment speed.

5.7 Comparative Synthesis and Tipping Conditions

5.7.1 Summary Metrics Table

Metric (2030)	A — Status Quo	B — Fracture	C —	D —

			Partnership	Sovereignty
M1 Compute ratio US/EU	18–20:1	25–30:1	8–10:1	8–12:1
M2 FLOP cost gap	2.4–3.2×	4–6×	1.5–2.0×	1.8–2.5×
M3 US cloud share (%)	72–75	78–82	60–65	50–55
M4 EU productivity (%/yr)	+1.0–1.5	+0.3–0.8	+1.8–2.5	+1.2–2.0
M5 EU energy (TWh)	~115	~95	~140	~155
M6 CACI ratio	10–15:1	20–35:1	4–7:1	8–12:1
Estimated probability	40–50%	15–20%	15–20%	15–20%

Table 11. Comparative summary of the four scenarios on the six divergence metrics. Source: author's construction.

[Graph G5]
CACI(US)/CACI(EU) Trajectories 2025–2030 by Scenario (4 curves)

5.7.2 Tipping Conditions Between Scenarios

The actual trajectory will likely follow a hybrid path between these scenarios. Three tipping points determine the possible transitions.

First tipping point: the Commerce report of July 2026. This report will determine whether US protectionism expands (tipping toward B or D) or remains targeted (remaining in A or C). Indicators to watch include: the evolution of the American semiconductor trade deficit, the fill rate of CHIPS Act fabs (Intel, TSMC Arizona, Samsung Taylor), and domestic political pressure (2026 midterms). The outcome of Phase 1 negotiations (report due April 14, 2026) will be an early signal.[14]

Second tipping point: the speed of EU Gigafactory deployment. The Commission plans the first operational Gigafactories in 2027–2028. If this timeline is met, the EU tips toward proactive scenarios (C or D). If permitting, financing, or hardware procurement delays push deliveries to 2029–2030, the EU remains in reactive mode (A or B). The CFG proposal for Special Compute Zones (180-day permitting vs. current 24+ months) is the key accelerating factor.[15]

Third tipping point: the French decision on nuclear for AI. France possesses a unique asset in Europe: a nuclear fleet providing 65–70% of electricity, with globally competitive marginal cost. The decision to dedicate significant capacity (10–20 GW) to AI data centers, through fleet extension, new EPR2s and SMRs, will determine whether France becomes Europe's AI energy hub or cedes this position to others (Scandinavia with hydroelectric power, Eastern Europe with low land costs). This tipping point is distinctly French and determines France's position within the European scenarios.[16]

5.7.3 The Convergence Point: 2028

The four scenarios converge on a common critical point in 2028. This is the year when: (i) compute demand will exceed installed capacity in Europe, creating material bottlenecks (even under moderate protectionism); (ii) the initial effects of expanded tariffs (if adopted) will be fully felt; (iii) Gigafactories, if deployed on time, will begin producing significant local compute; (iv) data center energy demand will saturate grid connection capacity in several member states. The year 2028 therefore constitutes the moment of truth when Europe will discover whether it is on trajectory A/B (growing dependency) or C/D (catch-up begun). The decisions made in 2026–2027 — US Commerce report, Gigafactories, French nuclear — will be irreversibly committed.

[Graph G6]
Tipping Points Chronology 2026–2030 and Decision Windows

Notes

[1] Epoch AI (January 2026), “Trends in AI Hardware and Compute.” The doubling every 7 months of AI chip production combines 1.6×/year in quantity and 1.6×/year in performance per chip. Even a slowdown to 12 months would imply a quadrupling by 2030.

[2] IEA (April 2025), Energy and AI, Paris. The 800–950 TWh projections correspond to the IEA’s medium and high scenarios, with the low end of the range assuming a slowdown in AI adoption.

[3] United States Supreme Court (February 20, 2026), Learning Resources Inc. v. Trump and V.O.S. Selections v. United States, 6-3 decision: “IEEPA does not authorize the President to impose tariffs.” See Tax Foundation (2026), Tariff Tracker.

[4] White House (January 14, 2026), Proclamation 11002, section (2): “By July 1, 2026, the Secretary shall provide me with an update on the market for semiconductors that are used in United States data centers, so that the President may determine whether it is appropriate to modify the tariff.”

[5] Tax Foundation (February 2026), op. cit. The US-EU agreement (August 2025) caps semiconductor tariffs at 15% for the EU, but Proclamation 11002 explicitly provides for “broader tariffs” possible after Phase 1. The “aggressive” pole assumes a breach of this agreement.

[6] European Commission (2025), AI Continent Action Plan. Objective: triple the EU’s data center capacity in 5–7 years. 19 AI Factories selected, up to 5 Gigafactories (100,000+ GPUs each) planned. InvestAI fund: €20 billion to catalyze private investment. CFG (October 2025), “Special Compute Zones”: 180-day permitting, converted industrial zones.

[7] Tax Foundation (February 2026), op. cit. The US-EU agreement of August 2025 includes a 15% cap on semiconductor tariffs for the EU, reduction of auto tariffs from 27.5% to 15%, and negotiated sectoral exemptions.

[8] EuroHPC JU (2025). The 19 AI Factories plan up to 25,000 GPUs each (standard sites). Even at full capacity, this represents ~475,000 GPUs, less than the xAI Colossus cluster alone (200,000 H100 GPUs, expandable). Segler Consulting (June 2025) estimates total EU public capacity at ~57,000 accelerators in 2025.

[9] Proclamation 11002, section on the tariff offset program: “a tariff offset program to incentivize domestic manufacturing as previously announced.” Snell & Wilmer (February 2026), “The Continued Utilization of Tariffs to Control the Semiconductor Industry.”

[10] McKinsey Global Institute (May 2024), op. cit. The 0.3% figure corresponds to the “slow adoption” scenario, close to today’s level of productivity growth in Western Europe.

[11] Council of the EU (December 2025), adoption of the position on the amended regulation for AI Gigafactories. The provisional timeline places the first calls for tenders in late 2025 and the first operational installations in 2027–2028.

[12] CFG (October 2025), “Tripling the EU’s Data Centre Stock with Special AI Compute Zones.” The proposal advocates reuse of decommissioned industrial sites (former coal plants) with heavy grid connections, such as in Greece (former lignite mines converted).

[13] EuroHPC JU (March 2025), DARE project (Digital Autonomy with RISC-V in Europe), a 6-year program to develop integrated circuits based on the RISC-V processor. Three processor projects by distinct companies.

[14] Proclamation 11002, section (2): the Secretary of Commerce and the USTR must provide a report on the status of negotiations within 90 days, i.e., April 14, 2026. Pillsbury Law (January 2026), “Trump Admin Targets Advanced AI Semiconductors, Defers Broader Tariffs.”

[15] CFG (October 2025), op. cit. The average permitting time for a data center in the EU is currently 24+ months (versus 6–12 months in the United States). The SCZ proposal would reduce this to 180 days via a “single-window” process.

[16] RTE (2024), Futurs énergétiques 2050, scenario “N03.” France plans +10 GW of demand for data centers by 2030. The French nuclear advantage (65–70% of the mix) is unique in Europe and represents the main competitive differentiating factor for attracting AI investments.

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