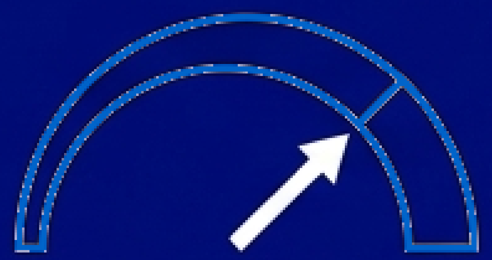
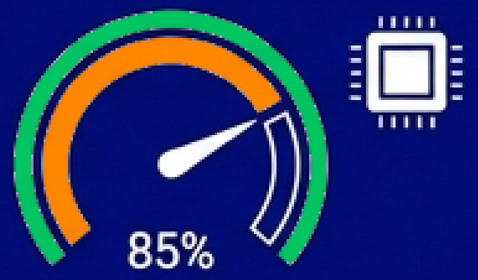
The New Substrate: Hyperscale AI, the $1.46 Trillion Rebuild, and the Supply Chain That Has to Absorb It

Market Intelligence | For Those That Need To Know
August 20, 2026
Executive Briefing from Jonathan Custer

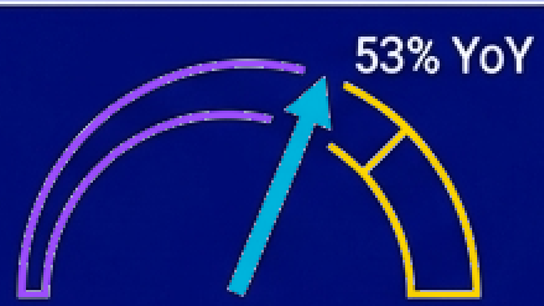
Custer Contexo Group | Sector Dashboard



PCBs: HDI & heavy-copper board demand up (Taiwan Printed Circuit Association [TPCA], 2026).



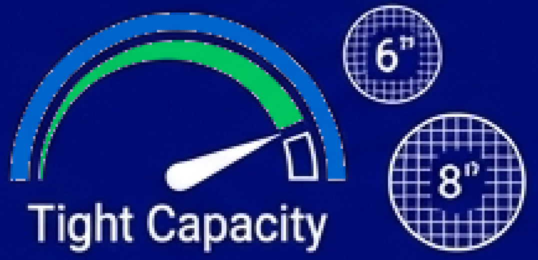
EMS: Tier-1 automotive EMS utilization tracking at 85% capacity.



Semiconductors: Automotive power semiconductors (SiC) revenue up 53% YoY (Rohm Semiconductor, 2026).

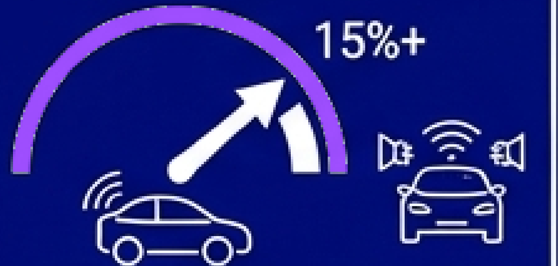
Electronic Components: MLCC lead times stretching 24-36 weeks; automotive technology competing directly with AI servers for capacity (Nichidenbo, 2026).

Electronic Materials: Low-CTE fiberglass cloth shortages affecting ADAS computing (DigiTimes, 2026).



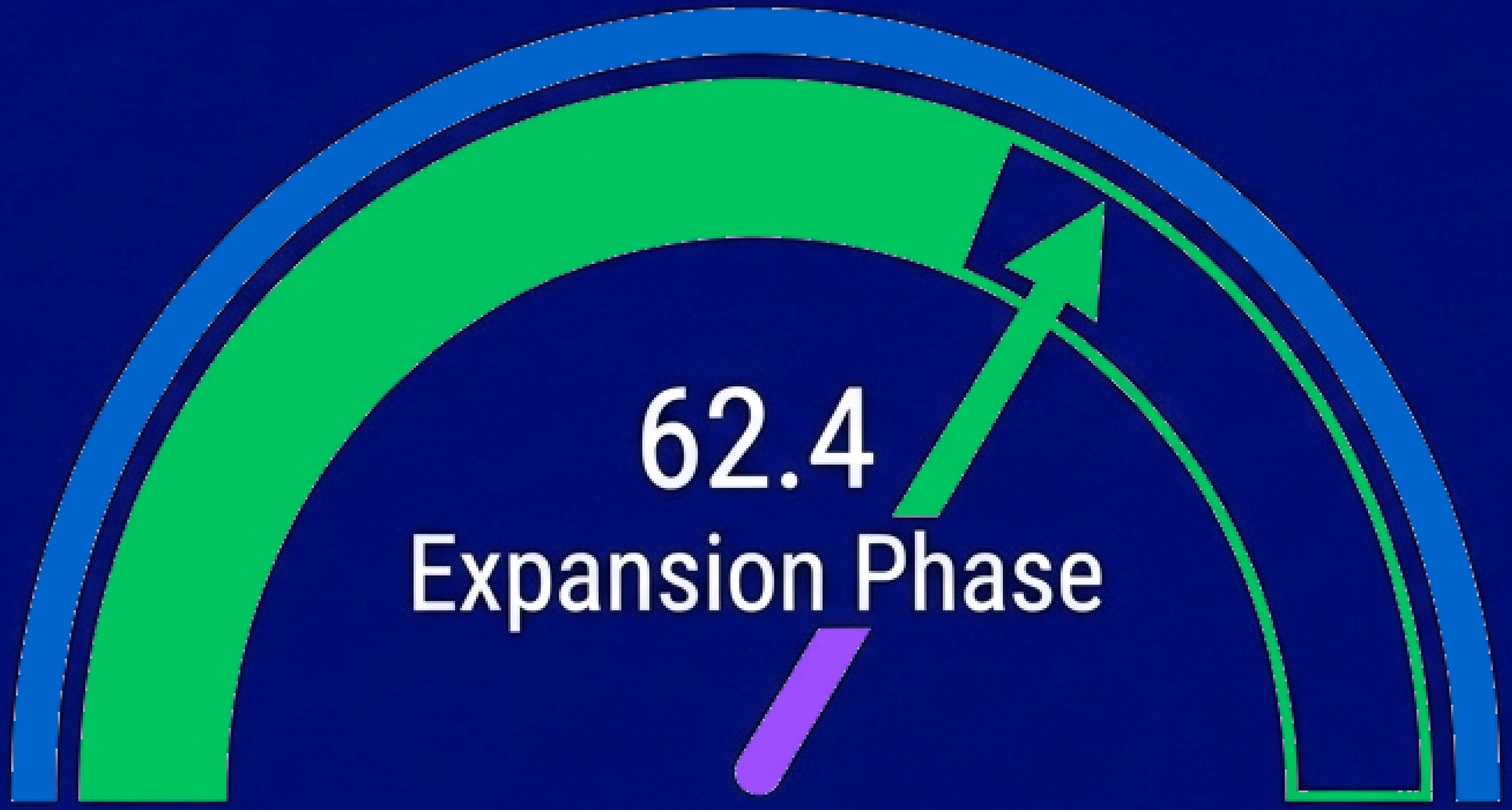
Process Equipment: 6-inch and 8-inch mature node capacity tight; alternative sourcing required as foundries prioritize advanced nodes (DigiTimes, 2026).

OEMs: Sustained EV platform builds despite macro headwinds.



End-Market: Autonomous systems and smart cabin electronics driving 15%+ silicon content growth per vehicle.

Custer Contexo Group | Custer World PCB Composite Index



Index = 0.40(Pulse) + 0.30(Climate) + 0.10(Friction) + 0.20(Sentiment)

Signal Bands Legend
0-45 (Contraction)
45-55 (Neutral/Transition)
55-100 (Expansion)

Pulse (40%): Order books & Book-to-Bill: Walsin BTB reached 1.8, up from 1.4 (Walsin Technology, 2026).

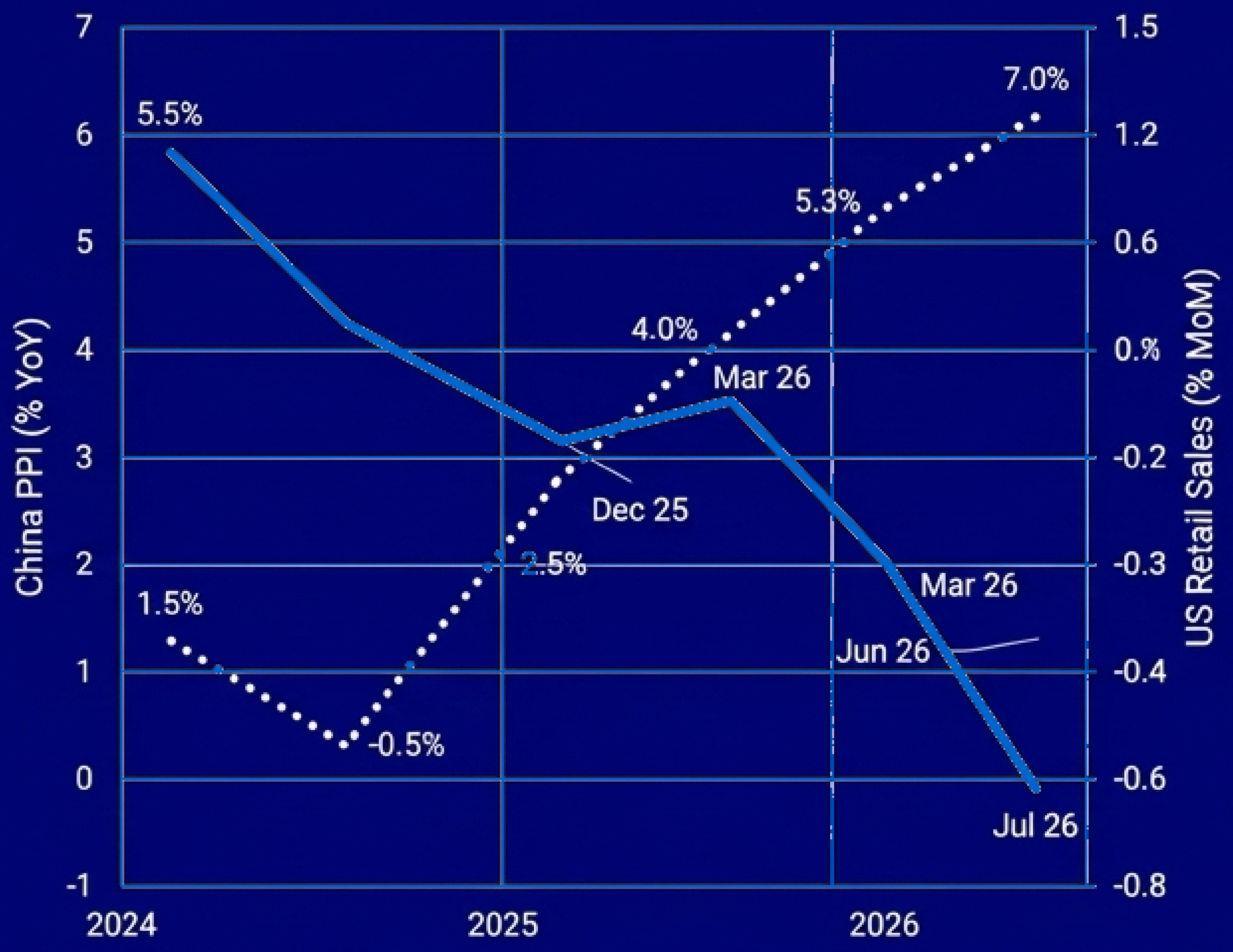
Climate (30%): Macro conditions & CapEx: Zhen Ding committing NT$80B CapEx for capacity expansion (Zhen Ding Tech, 2026).

Friction (10%): Supply chain bottlenecks, energy costs, and raw material pricing.

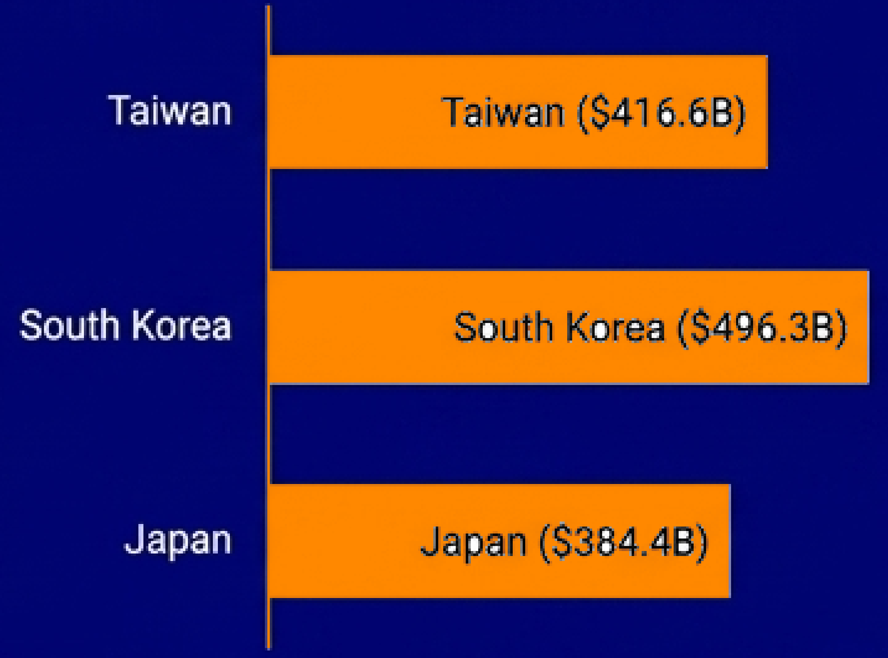
Sentiment (20%): Industry outlook, hiring trends, and specific sector guidance.

Custer Contexo Group | Contexo PCB Composite Index by Market

Region	Current Score	Signal Band	One-Line Summary
US	54.1		Defense/Aero driving growth, consumer softness offsets (Arrow Electronics, 2026).
Taiwan	68.5		AI server HDIs and ABF substrates driving record revenues (Gold Circuit Electronics, 2026).
ASEAN	65.2		Direct beneficiary of China+1 EMS relocation and automotive builds (Benchmark, 2026).
China	58.7		High-speed board orders booked through 2027; material shortages persist (Szzg, 2026).
South Korea	61.3		Strong memory substrate demand lifting PCB sector health (Isu Petasis, 2026).
Japan	52.8		Steady specialized substrate demand, hindered by rare earth export curbs (Nikkei Asia, 2026).
Europe	49.5		Stabilized EMS market; strong defense spending offsetting industrial lag (EMSNOW, 2026).
Global	62.4		Upward trajectory anchored heavily by hyperscale data center build-outs.



Economic Indicators:
China July PPI recorded at 3.5% YoY, marking a 3-month low (Reuters, 2026). US retail sales fell 0.6% in July, the first decline in nine months (Reuters, 2026).



Trade Shifts:
Taiwan and South Korea overtook Japan in 1H26 total exports ($416.6B and $496.3B vs. $384.4B, respectively). This shift is driven predominantly by IC shipments ($133B and $149B) versus legacy equipment (Nikkei Asia, 2026).

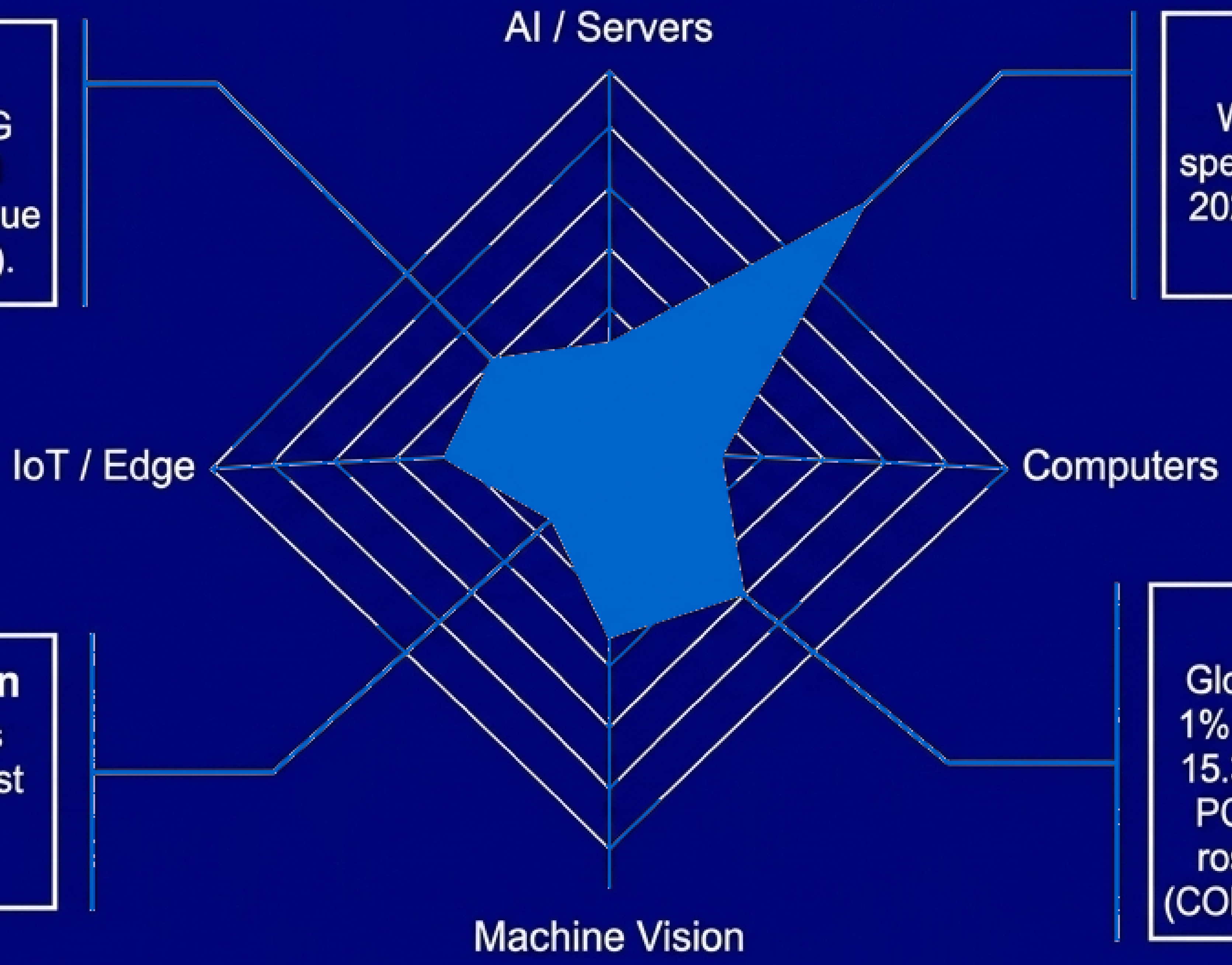
Hyperscaler CapEx Concentration:

Combined property, plant, and equipment assets of **Amazon, Alphabet, Microsoft,** and **Meta** hit **$1.46 Trillion** at the end of June. This represents a 140% increase over three years and 48% YoY, transforming software giants into the world's largest infrastructure operators (QUICK Factset, 2026).

Custer Contexo Group | Demand Side Velocity

IoT / Edge / Networking
Wi-Fi 7, DOCSIS 4.0, and 10G PON upgrades driving record revenues; Sercomm July revenue up 51% YoY (Sercomm, 2026).

AI / Servers
Worldwide AI-optimized IaaS spending forecast to grow 96% in 2026 to $42B, reaching $66B by 2027 (Gartner, 2026).



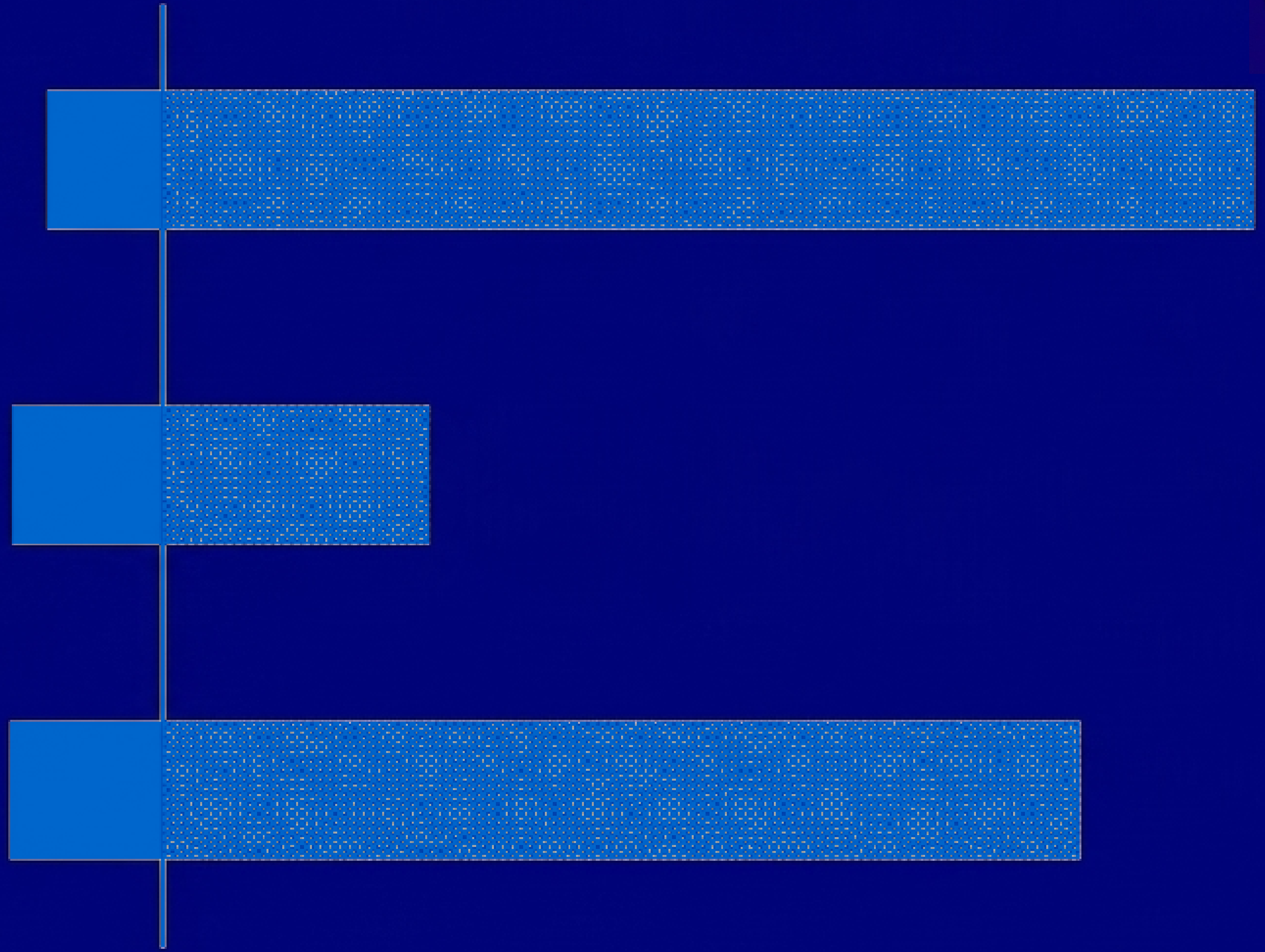
Robotics / Machine Vision
China industrial robot exports increased 13.2% YoY in the first seven months of 2026 (DigiTimes, 2026).

Computers
Global notebook sell-through fell 1% YoY in units, but ASP climbed 15.3% to EUR801 on premium AI PC mix. Acer desktop PC sales rose 30.6% in July on AI usage (CONTEXT, 2026; Acer Inc., 2026).

Quanta Computer: July revenue reached NT$366.27B, up 131.32% YoY due to AI server demand, completely offsetting notebook shipments which fell 37.7% MoM to 2.8 million units (DigiTimes, 2026).

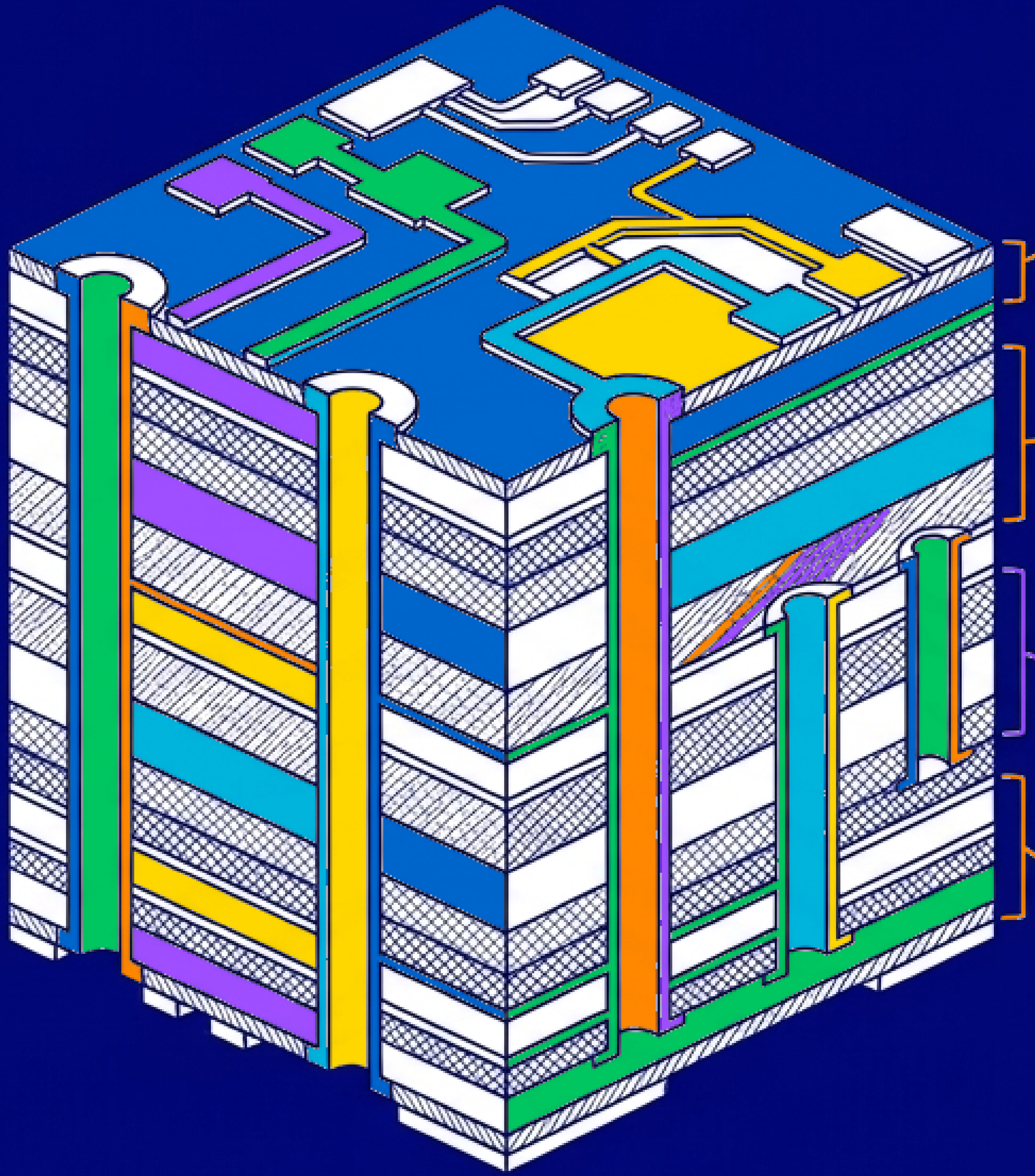
Inventec: July revenue of NT$90.19B, up 65.73% YoY. Notebook units declined single-digits; transition to L6 server systems supporting gross margins despite lower ASPs (DigiTimes, 2026).

Wistron: July revenue up 60.8% YoY to NT$308.22B. Securing enterprise system-assembly and neocloud orders (HPE, Lenovo, Oracle) to offset Tier-1 hyperscaler dominance (DigiTimes, 2026).



Geopolitics & Supply Chain Shifts: Sustained capacity relocation to **Mexico**, Thailand, and **Vietnam** to **de-risk US-China** trade policies and capture China+1 mandates (Benchmark, 2026).

Custer Contexo Group | Printed Circuit Boards & Substrates



Server Architecture Shift:
AI servers demand a transition to 20-30 layer PCBs with stricter impedance control and crosstalk suppression (Szzg, 2026).

Glass Substrates:
Glass core substrates are emerging to solve the thermal and density physical limitations of organic substrates; 18 listed Chinese companies moving into the space (DigiTimes, 2026).

Financial Impact:
Record profits reported. Gold Circuit Electronics 1H26 EPS at NT$16.14; Zhen Ding Tech 1H26 revenue up 13.9% with a planned NT$80B CapEx (DigiTimes, 2026).

Shortages & Constraints:
Lead times extending rapidly. Severe tightness in ABF substrate capacity is constraining optical module output and driving up prices (ETtoday, 2026).

Memory (HBM/DRAM): Supply severely constrained. Micron currently fulfilling less than 50% of data center customer demand, reporting an 81% quarterly operating margin. Memory costs reached 34% of the iPhone 18 Pro BOM (TrendForce, 2026).

Electronic Components: MLCCs for AI servers facing 30% price hikes (Samsung Electro-Mechanics). Tantalum prices soared 158% (Szzg, 2026; Nichidenbo, 2026).

Optical Transceivers: Transition to 800G/1.6T speeds is heavily constrained by DSP availability and severe Indium Phosphide (InP) substrate shortages (DigiTimes, 2026).

Geopolitical Risks: US FCC weighing restrictions on Chinese optical modules. With Zhongji Innolight holding 27% and Coherent 17% of revenue, a ban threatens AI cluster deployment timelines before Western capacity can scale (DigiTimes, 2026).

Custer Contexo Group | Process Equipment

Standard Lead Times

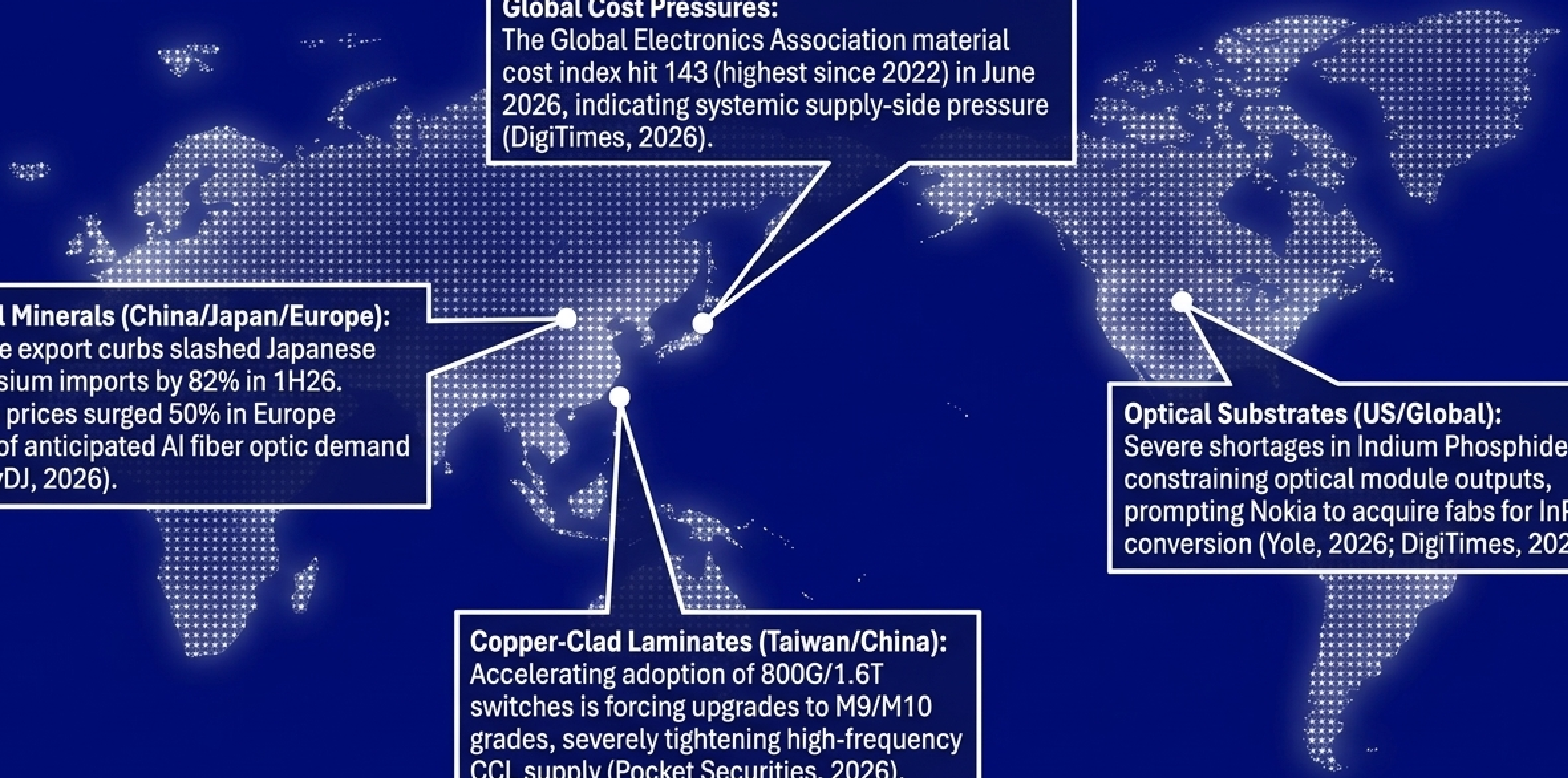
Extended Lead Times: Etch and thin-film deposition tool lead times have doubled to 12 months. Advanced packaging equipment lead times are stretching beyond 18 months (ijiwei, 2026).

Market Growth: Global semiconductor manufacturing equipment sales are projected to rise 23.2% to $165.9B in 2026, reaching $229.5B by 2028 (SEMI, 2026).

Manufacturing Bottlenecks: OEMs are hitting internal capacity limits. Suppliers are being forced to shift to build-to-print contract manufacturing to bypass production delays (EE Times, 2026).

Power Constraints & Co-Optimization: AI fabs face extreme power density challenges. Full-reticle AI chips average 3,600 watts (140 W/cm2), requiring urgent systems-technology co-optimization (Applied Materials, 2026).

Current Extended Lead Times



Global Cost Pressures:
The Global Electronics Association material cost index hit 143 (highest since 2022) in June 2026, indicating systemic supply-side pressure (DigiTimes, 2026).

Critical Minerals (China/Japan/Europe):
Chinese export curbs slashed Japanese dysprosium imports by 82% in 1H26. Erbium prices surged 50% in Europe ahead of anticipated AI fiber optic demand (MoneyDJ, 2026).

Optical Substrates (US/Global):
Severe shortages in Indium Phosphide (InP) constraining optical module outputs, prompting Nokia to acquire fabs for InP conversion (Yole, 2026; DigiTimes, 2026).

Copper-Clad Laminates (Taiwan/China):
Accelerating adoption of 800G/1.6T switches is forcing upgrades to M9/M10 grades, severely tightening high-frequency CCL supply (Pocket Securities, 2026).

Custer Contexo Group | Supply Chain Heat Map

Sector	Current Index Score	Constraint Level	30-Day Trend
PCBs (High-Layer/ABF)	88.4	RED (Severe Constraint)	↑
Components (HBM/MLCCs)	92.1	RED (Severe Constraint)	↑
Materials (InP/Rare Earths)	85.0	RED (Severe Constraint)	↑
Process Equipment	78.5	YELLOW (Warning)	↑
ODM/Assembly	60.2	YELLOW (Warning)	→
OEMs (Consumer/Auto)	45.5	GREEN (Adequate)	↓

Quadrant 1: CEOs / Sr VPs

Value: Navigating Capex vs. Capacity.

Takeaway: Reallocate legacy consumer fab capacity to advanced packaging/PLP.

High-Value Question: Are our facility power and cooling grids capable of sustaining 2027 AI server architectures (3,600W/chip)?

Quadrant 2: Sales & Marketing

Value: Shifting End-Markets.

Takeaway: Pivot messaging from consumer volume to high-margin, high-reliability AI/Edge/Defense applications.

High-Value Question: How do we bundle hardware with AI-agent validation to increase margin?

Quadrant 3: Finance & M&A

Value: Protecting Gross Margins.

Takeaway: BOM costs are rising (Memory, PCBs); transition to consignment models to avoid margin dilution.

High-Value Question: Where in the upstream material supply chain can we acquire strategic assets to secure supply?

Quadrant 4: Procurement

Value: Supply Chain Resilience.

Takeaway: Diversify away from single-source InP and high-end MLCCs; prepare for incoming tariffs on Chinese memory/optics.

High-Value Question: Have we mapped our BOM exposure all the way down to the raw mineral level?

Custer Contexo Group | Sources Cited

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