

# THE KINETIC AGE

2026

Physical Intelligence and the  
Reordering of the Real World



# THE KINETIC AGE



## INTRODUCTORY NOTE FROM UP.PARTNERS

The global balance of technological power is being rewritten in real time. We are entering a new industrial era: one defined not by software alone, but by intelligence embedded in the physical world. AI is escaping the screen and flowing into factories, vehicles, energy systems, defense architectures, and national strategies. The Gulf Cooperation Council (GCC) is rising as a force of capital and sovereignty. The West is rediscovering industry. Defense is fragmenting. Energy is emerging as AI's defining bottleneck. Venture capital is recalibrating to a more capital-intensive world. And craftsmanship is re-appearing at the frontier of automation. The Kinetic Age is our field guide to navigating this reorganization of power, profit, and advantage.

At **UP.Partners**, this is not academic. Transforming the moving world requires operating at the intersection of AI and the physical economy across land, sea, air, and space. Each year, this research sharpens our conviction, refines our theses, and informs where we deploy capital. We use it to identify structural inflection points, partner with founders building generational companies, and align our investment practice with the industrial realities of the decade ahead. We hope you find it provocative and useful.

Adam Grosser  
Chairman & Managing Partner



UP.PARTNERS

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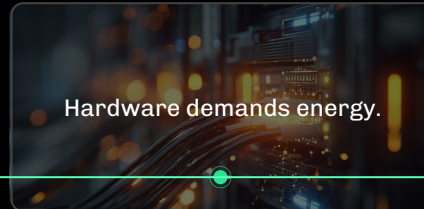
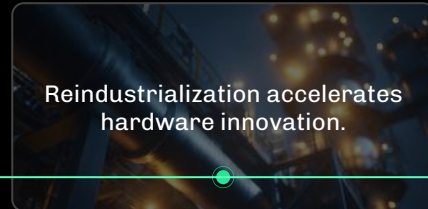
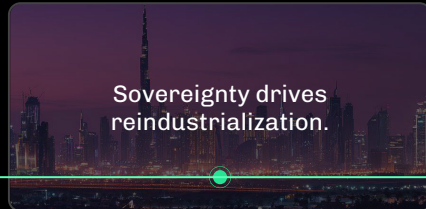
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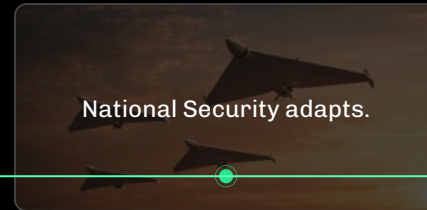
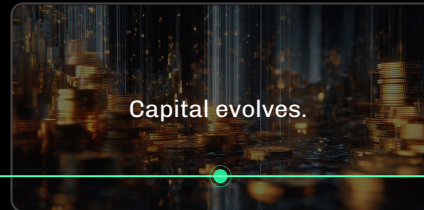
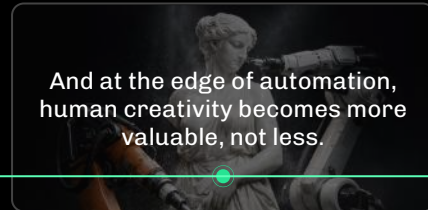


# KEY POINTS: TL;DR

The Kinetic Age is defined by eight forces operating as a mutually reinforcing system.



The scale of capital now forming around physical intelligence is historic.



Investors backing AI platforms with valuations in the hundreds of billions of dollars are underwriting a generational expansion in productivity. Autonomous mobility systems valued in the hundreds of billions with limited fleets on the road are being priced not on today's deployment, but on tomorrow's infrastructure. Every major leap in connectivity — from rail to aviation to the internet — expanded GDP by compressing time and distance. AI-native hardware compresses both again. The result is a multi-decade industrial buildout that will redefine advantage.

# THE FUTURE IS HERE; IT'S JUST NOT AVAILABLE TO EVERYONE

## WE LIVE WITH SCIENCE FICTION...

We are no longer speculating about the future. We are inhabiting it. Autonomous vehicles thread through city streets. Robots fold laundry, build houses, and assist in surgery. Electric air taxis are carrying paying passengers. What lived for decades in the pages of science fiction and on cinema screens is now humming, flying, driving, and scaling in the real world.

## ...BUT IT IS FAR FROM EVENLY DISTRIBUTED

And yet, this future is radically uneven. It exists in pockets — specific geographies, income strata, and industries — while remaining almost inconceivable to billions who share the same planet. We are not living in a single technological era. We are living in multiple futures at once.

EACH DOT IS ~3.2 MILLION PEOPLE

2,500 dots = 8.1 billion humans.  
Color = most advanced AI interaction, Feb 2026.



- Never used AI  
~6.8B (84%)
- Free chatbot user  
~1.3B (16%)
- Pays \$20/mo for AI  
~15-25M (~0.3%)
- Uses code scaffolding  
~2-5M (~0.04%)

# THE DISTRIBUTION OF TECHNOLOGY CAN BE EXAMINED THROUGH 3 LENSES



## LENS 1

### ACCESS

The future does not arrive everywhere at once. It lands in clusters — select cities, elite institutions, advantaged balance sheets — before it diffuses outward. Breakthrough technologies are not democratic at inception; they are concentrated. Geography and income still determine who lives in tomorrow and who waits for it.

## LENS 2

### UNEQUAL BENEFITS/HARMS

Even when technology spreads, its upside and downside are uneven. Productivity gains, wealth creation, & safety improvements accrue disproportionately. So do job displacement, surveillance risks, and environmental externalities. Innovation is not neutral. It redistributes power, profit, and consequence, often in ways we fail to anticipate.

## LENS 3

### GEOPOLITICAL GAPS

In several critical industries, the frontier is no longer centered in the United States. The future, in some domains, is scaling faster elsewhere. China is the most visible example, moving with strategic coherence and industrial velocity. The map of technological leadership is being redrawn in real time.

# LENS 1 ACCESS

## ACCESS PARADIGMS AND ADOPTION

LENS 2  
UNEQUAL BENEFITS/HARMS

LENS 3  
GEOPOLITICAL GAPS

### THE RISE OF WAYMO

Autonomous vehicles are logging millions of real-world miles and have become unremarkable fixtures on the streets of San Francisco and Los Angeles. And yet, for most Americans, they remain something they've only read about; proof that even transformative technology can feel both ubiquitous and distant at the same time.

### A \$100B AIR TAXI BACKLOG

Electric air taxis are carrying their first paying passengers, while most of humanity has yet to fly in any aircraft.

### DRONES IN SUBURBIA

In pockets of the world, the sky has quietly become a logistics network. Commercial drone delivery is live. Amazon, Zipline, Wing are delivering hundreds of thousands of packages. Sidewalk robots are rolling through neighborhoods. What was once a speculative rendering of frictionless commerce is now a daily occurrence in ZIP codes across Florida, Texas, and California.

### INTERNET FROM ORBIT

What began as a bold engineering experiment has become something far more consequential. Starlink is quietly, almost subversively, emerging as one of the most democratizing connectivity platforms ever deployed.

# AUTONOMOUS VEHICLES ARE NO LONGER A SCIENCE EXPERIMENT; THEY ARE A COMMERCIAL REALITY

## WAYMO HAS PROVEN THAT PASSENGER AV'S MAKE SENSE COMMERCIALY

**More than 170M**  
rider-only miles driven

**90% reduction**  
in serious injury crashes  
vs. human drivers

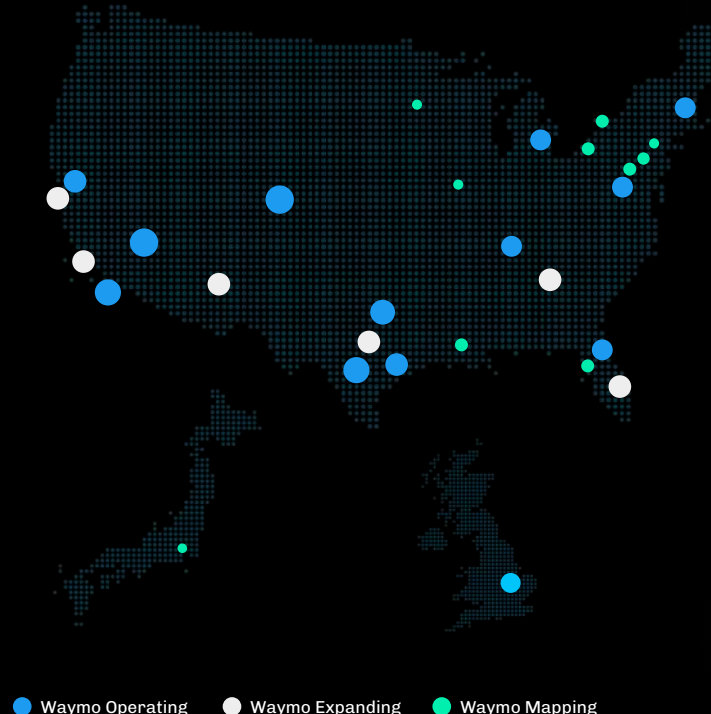
**82% fewer**  
airbag deployment crashes

**85% reduction**  
in police-reported crashes

## WAYMO IS NOW COMMONPLACE (AND BORING) IN THE CITIES WHERE IT OPERATES

Waymo is operating in LA, Miami,  
Phoenix, and the SF Bay Area

Expansion underway into new  
markets including Atlanta, Austin,  
Nashville, D.C., Dallas, Houston, San  
Antonio, and Orlando



● Waymo Operating   ● Waymo Expanding   ● Waymo Mapping

## TESLA FSD IS THE DATA ENGINE BEHIND THE NEXT FRONTIER

Tesla FSD has logged >1 billion  
autonomous miles, the largest AV  
training dataset in the world

FSD V12 deleted 300,000 lines of  
code in favor of neural networks, a  
fundamental architectural shift

Tesla confirmed production for the  
Cybercab: a purpose-built vehicle  
without a steering wheel or pedals



## JENSEN HUANG PREDICTS AV'S AS A TRILLION DOLLAR OPPORTUNITY

# NEW ECOSYSTEM PARTNERSHIPS ARE ACCELERATING ACCESS TO AUTONOMOUS VEHICLE DEPLOYMENT AT SCALE

Technology platforms, OEMs, and network operators are converging to enable real-world AV commercialization.



Uber is betting big on AV integration, looking to retain control of the network.

- Formed AV Labs to focus on real-world data capture at scale
- Announced a goal to deploy 25k robotaxis
- Plans to offer robotaxi services using the Mercedes S-Class in major global cities



Rivian is entering the robotaxi arena with plans to deploy 50k vehicles.

- Uber will invest up to \$1.25B in Rivian in a deal to deploy its upcoming R2 EV as a robotaxi across the U.S., Canada, and Europe



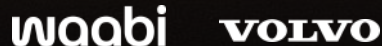
Lyft is building its own AV ecosystem.

- Established partnerships with Mobileye, May Mobility, and Nexar to create a "Lyft-ready" AV tech ecosystem
- Targeting commercial AV launches in Dallas and Nashville in 2026
- Strategy mirrors Uber's: be the platform, not the manufacturer



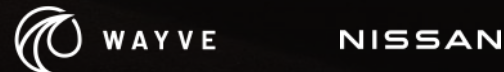
NVIDIA is building the brain for the next generation of AVs.

- At CES, NVIDIA announced Alpamayo: a new family of open source AI models and tools designed to act as the central intelligence layer for next-generation autonomous vehicles



Waabi is expanding beyond AV trucking through a \$1B robotaxi partnership with Uber

- Partnering with Volvo to deploy fully driverless trucks in Texas by end of 2025



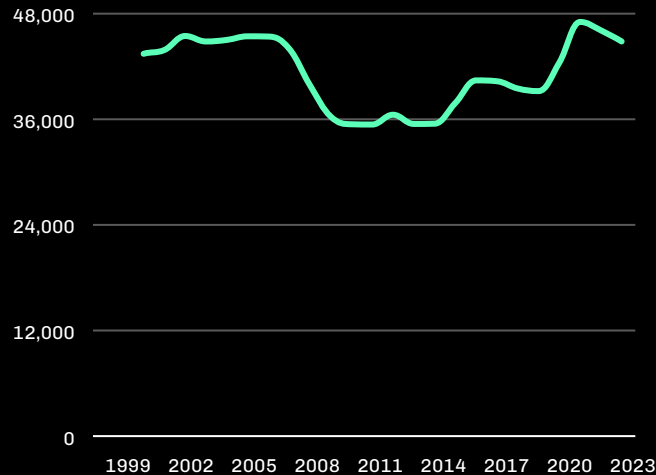
Wayve is scaling an end-to-end AI driver for global AV deployment.

- In 2026, raised ~\$1.5B with backing from Microsoft, NVIDIA, Uber, and major OEMs
- Partnering with Uber & Nissan to launch robotaxis in Tokyo in '26 and expand globally
- Demonstrated zero-shot driving across 500+ cities, enabling mapless scalability

# DESPITE THE MOMENTUM, FOR MOST AMERICANS, AV'S REMAIN SOMETHING THEY READ ABOUT, NOT SOMETHING THEY RIDE

While Waymo's are commonplace in SF and LA, rural, lower-income, and mid-sized cities still don't have a credible timeline for access.

Deaths and MV rates, 1999-2023



Regulators are demanding rigorous safety validation and accountability

Only 23 U.S. states explicitly permit AV passenger operations, creating a fragmented regulatory landscape that stymies nationwide scaling.

Public trust is fragile: only 27% of US citizens trust AVs

Tesla's accelerated approach has raised concerns, and potentially increased crash rates (3x higher). NHTSA revealed that Tesla's robotaxi was involved in 14 reported incidents since its mid-2025 launch.



**40,000 AMERICANS ARE KILLED ON U.S. ROADS EVERY YEAR, NOT BECAUSE SOLUTIONS ARE UNKNOWN, BUT BECAUSE THE SAFEST TECHNOLOGY REMAINS OUT OF REACH FOR MOST DRIVERS**

# IN A WORLD WHERE 80% OF HUMANS HAVE NEVER FLOWN ON AN AIRPLANE, FLYING TAXIS ARE NEARING REALITY

The US eVTOL market has gone through a shakeout. Three clear leaders remain, vying for position in a \$1T+ market.



 Joby

Joby remains the U.S. certification frontrunner, moving through the FAA's multi-stage certification process with its S4 aircraft.

- **Flight testing at scale:** 850+ flights, 9,000+ miles, 4,900 test points (+260% YoY)
- **Blade acquisition** adds routes, terminals, and riders positioning Joby as a full urban air service operator
- **Manufacturing underway:** targeting ~4 aircraft/month by 2027, backed by Toyota
- **Commercial launch targeted 2026–2027**, pending final FAA certification



 BETA  
TECHNOLOGIES

BETA went public on the NYSE in Nov 2025, raising >\$1B and reaching a ~\$7.6B first-day valuation

- **Certification momentum:** Advanced FAA testing and achieved Type Certification for its electric propeller; a critical step toward commercial flight
- **Powering the future:** \$300M GE Aerospace deal to deliver next-gen hybrid-electric propulsion
- **Real commercial pull:** ~900-aircraft, multi-billion dollar backlog and \$1B in propulsion orders
- **Scaling the ecosystem:** Expanded to 50+ charging sites and deepened defense mission adoption.



 ARCHER

Archer is a fast follower, while quietly building a serious defense business

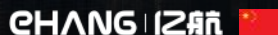
- **Formalized commercial launch corridors** with United Airlines, targeting service between Newark and New York City
- **International expansion** accelerated through a partnership with the Abu Dhabi Investment Office,
- **Delivered its first Midnight aircraft** for military logistics and medevac evaluation. Entered final implementation phase of FAA type certification

In March 2026, the FAA selected Joby, BETA, and Archer to begin flying real-world pilot program operations across 26 U.S. states

# MEANWHILE IN CHINA...



AutoFlight (Fengfei Aviation) built the world's first 5-ton eVTOL, carrying 10 passengers or heavy cargo up to 1,500 km with full cargo certification in 2026.



EHang holds the world's first triple certification for its EH216-S and has accumulated 80,000+ safe pilotless flights globally.

In March 2025, EHang's partners received the first Air Operator Certificates from the CAAC, officially enabling commercial pilotless air taxi flights in China.



TCab Tech signed the largest overseas eVTOL order to date: 350 aircraft for the UAE.



Major Chinese automakers Xpeng, Geely, and Changan have all entered the eVTOL space, bringing automotive scale and distribution to the industry.

# DRONES IN SUBURBIA: COMMERCIAL DRONE DELIVERY HAS CROSSED THE THRESHOLD FROM PILOT PROGRAM TO REAL INFRASTRUCTURE

Walmart has quietly become the world's largest operator of commercial drones spanning 7 states, 36 hubs, and 4 million households.



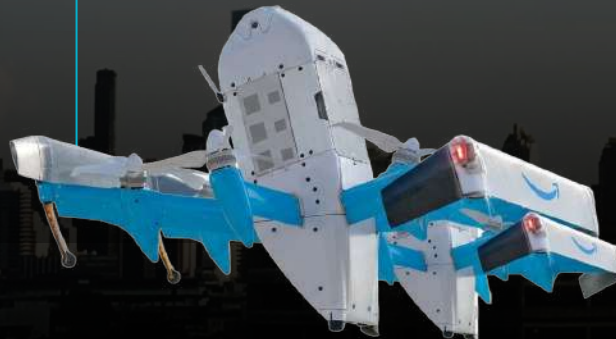
**750,000+ residential deliveries across 3 continents**

Partnering with Walmart to enable drone deliveries averaging under 10 minutes



**16,000 flights and 4,000 flight-hours**

Launched in 2022, operating in Texas, Arizona, Michigan, and Florida



**Over 125M miles flown globally**

Surpassed 2 million autonomous deliveries, delivering more than 20 million items



# WHILE DRONES FIGHT FOR AIRSPACE, **SIDEWALK ROBOTS RULE THE STREETS**

Ground robots are scaling across campuses, cities, and suburbs, completing millions of real-world deliveries. But like every mobility breakthrough before them, their reach remains uneven.

Starship Technologies leads with 8M+ autonomous deliveries across 50+ cities and 30+ universities in the U.S., UK, and Europe.

Coco, Serve Robotics, and Kiwibot are active in LA, Miami, San Jose, and college campuses nationwide.

# THE MARKET IS FRAGMENTED BUT THE DELIVERY NUMBERS **ARE REAL**

# IN FIVE YEARS, STARLINK HAS DONE WHAT A CENTURY OF TERRESTRIAL INFRASTRUCTURE COULD NOT: CREATE A TRULY UBIQUITOUS, DEMOCRATIZED CONNECTIVITY PLATFORM

## OVER THE PAST YEAR ALONE:

Expanded to **42 new** countries

Grew by **2.7 million+** active customers globally

Launched more than **100 Starlink** missions

Added **2,300+** satellites to the constellation

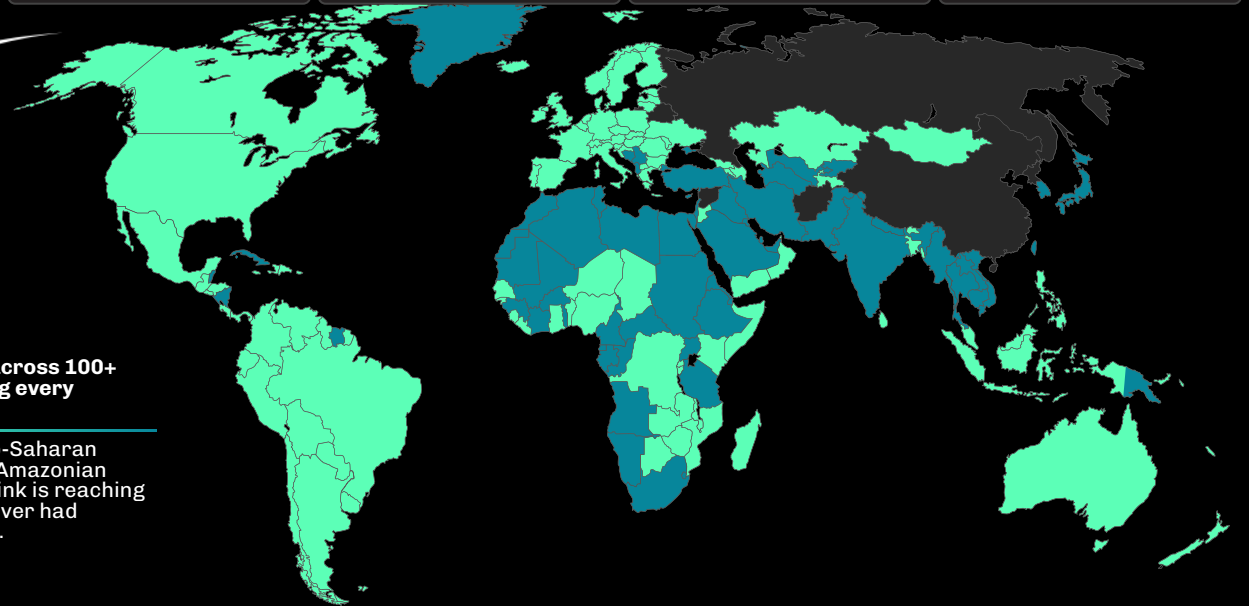
Invested heavily in ground infrastructure, network backbone, and internal technologies and systems



- Available
- Coming soon

**6M+ subscribers across 100+ countries, spanning every continent**

From Alaska to Sub-Saharan Africa and remote Amazonian communities, Starlink is reaching populations that never had reliable broadband.



## Humanitarian use is expanding rapidly

Deployments in refugee camps, disaster zones, and rural hospitals across Africa, southeast Asia, and Latin America are enabling telemedicine, education, and economic participation where none existed before.

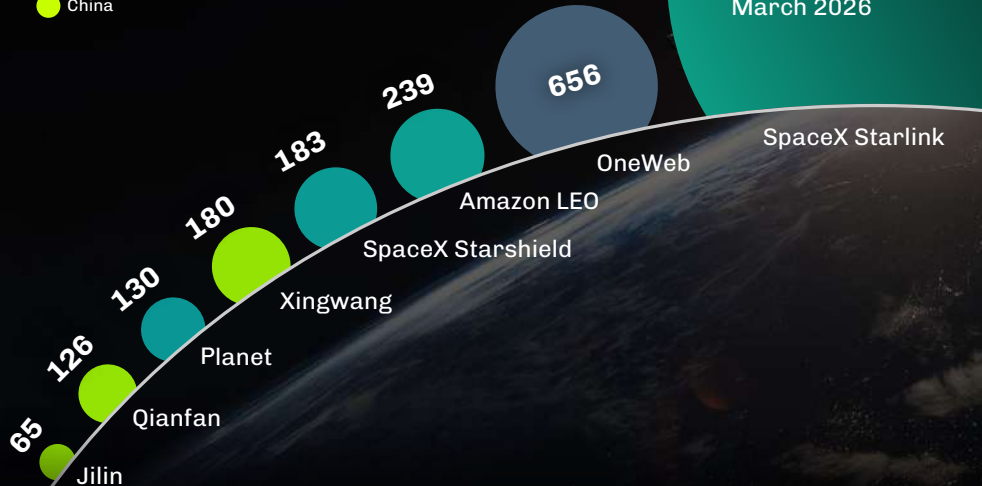
## But, 2.2 billion people remain offline

LEO constellations, led by Starlink's 6,000+ satellites, offer the first viable path to closing the global access gap.

# STARLINK HAS DOMINATED, BUT THE LEO CONSTELLATION RACE IS HEATING UP

Active Satellites in Low Earth Orbit – Top 8 Operators

- U.S.
- U.K.
- China



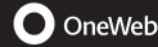
Surpassed **10,000** active satellites in March 2026



Amazon's Project Kuiper rebranded as Amazon Leo alongside a \$10B+ commitment from Jeff Bezos. The FCC has granted approval to launch another 3,236 satellites as Amazon aims to compete head-on with Starlink.



China is rapidly proliferating its satellite presence in LEO. XingWang plans to launch 13,000+ satellites focusing on national telecom, whereas Qianfan ("Thousand Sails") will compete with Starlink with a 10,000+ constellation.



Amidst a bankruptcy, the UK government rescued the company with a \$1B investment alongside India's Bharti Global, granting each ~40% ownership. OneWeb since merged with Eutelsat & restarted its launch cadence.



Planet's earth observation satellites have come to represent a real-time "source of truth" in modern geopolitics, shaping reporting and military strategies across Iran, Ukraine, and Israel.

LENS 1  
ACCESS

## LENS 2

### UNEQUAL BENEFITS/ HARMS

New technologies do not distribute their gains evenly and they rarely distribute their harms fairly.

LENS 3  
GEOPOLITICAL GAPS

### AI'S UNEVEN PRODUCTIVITY DIVIDEND

Technical expertise is no longer the bottleneck. AI is enabling entrepreneurs to no longer need to know how, instead, you just need a clear view of what to build. As a result, product management and vision are being rewarded more than pure engineering.

### THE AUTOMATION OF PHYSICAL LABOR

Robots are no longer just confined to labs. They're already clocked in on factory floors, in warehouses, fulfillment centers, and construction sites. Again, there are two sides: robots augment human productivity where populations are shrinking, but also displace some existing workers.

### THE HIDDEN COST OF AI INFRASTRUCTURE

The communities that host data centers are absorbing the water strain, energy load, and societal disruption, while the economic upside flows elsewhere.

# THE BEST ENGINEERS JUST GOT 10X BETTER. AI IS COLLAPSING THE TIME BETWEEN IDEA AND EXECUTION

## Code faster, not harder:

AI coding tools cut routine development time by **40–55%** and halve time spent on debugging and reviews.

## Design HW in weeks not years:

For hardware design and simulation, AI-assisted workflows reduce design-to-validation cycles by **~30–50%**

## Simulate and discover the unknown:

Microsoft screened **32 million battery** material candidates in weeks, a task that would have taken human researchers centuries.

## Radically improve efficiency:

Generative AI can improve a highly skilled worker's performance by nearly **40%** compared with workers who don't use it.

**THE GAP BETWEEN AI-NATIVE ENGINEERS AND EVERYONE ELSE IS COMPOUNDING. STARTUPS WITH 10 AI-AUGMENTED ENGINEERS ARE COMPETING WITH ENTERPRISES THAT HAVE THOUSANDS.**

# “

**From inception to flight in 71 days** is a clear demonstration of what's possible when Divergent's Adaptive Production System is utilized from day one.”

— **Kevin Czinger, CEO of Divergent, on the development of the Venom autonomous strike drone**

# THE ENGINEER'S GROWING AI TOOLKIT

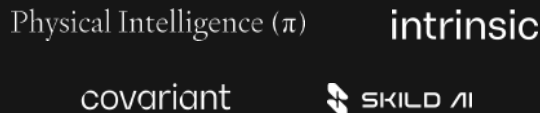
## FOUNDATION LLM MODELS



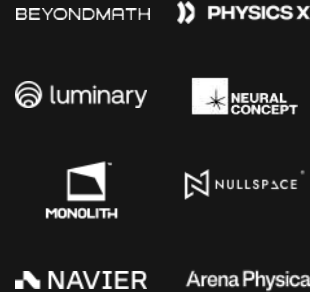
## CODING & SW PROTOTYPING



## ROBOTIC BRAINS & AUTONOMY



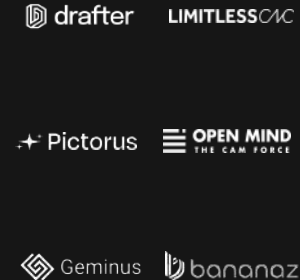
## CAE & SIMULATION



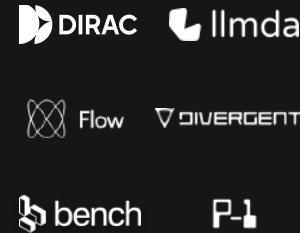
## CAD & OPTIMIZATION



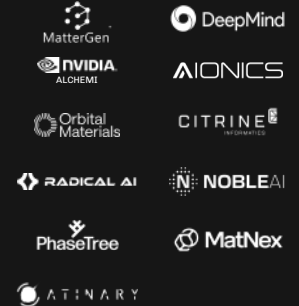
## DFM & CAM



## PLM & REQUIREMENTS MANAGEMENT



## MATERIALS DISCOVERY



## MANUFACTURING & PROTOTYPING



# COMPANIES SEE PRODUCTIVITY GAINS WHILE JUNIOR WORKERS ARE DISPLACED

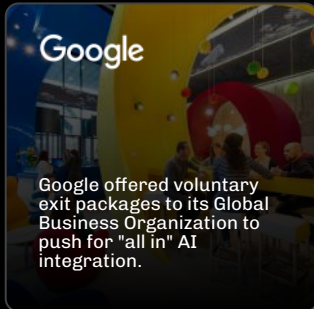
Entry-level job are often the first casualty. Junior white collar roles largely perform work that AI now does faster and cheaper.

## 2025 SAW MAJOR WORKFORCE CUTS AT TOP TECH AND PROFESSIONAL SERVICES FIRMS



**amazon**

Amazon cut 16,000 corporate staff (late 2025/early 2026) to remove management layers, while exploring plans to automate up to 75% of its labor force.



**Google**

Google offered voluntary exit packages to its Global Business Organization to push for "all in" AI integration.



**Microsoft**

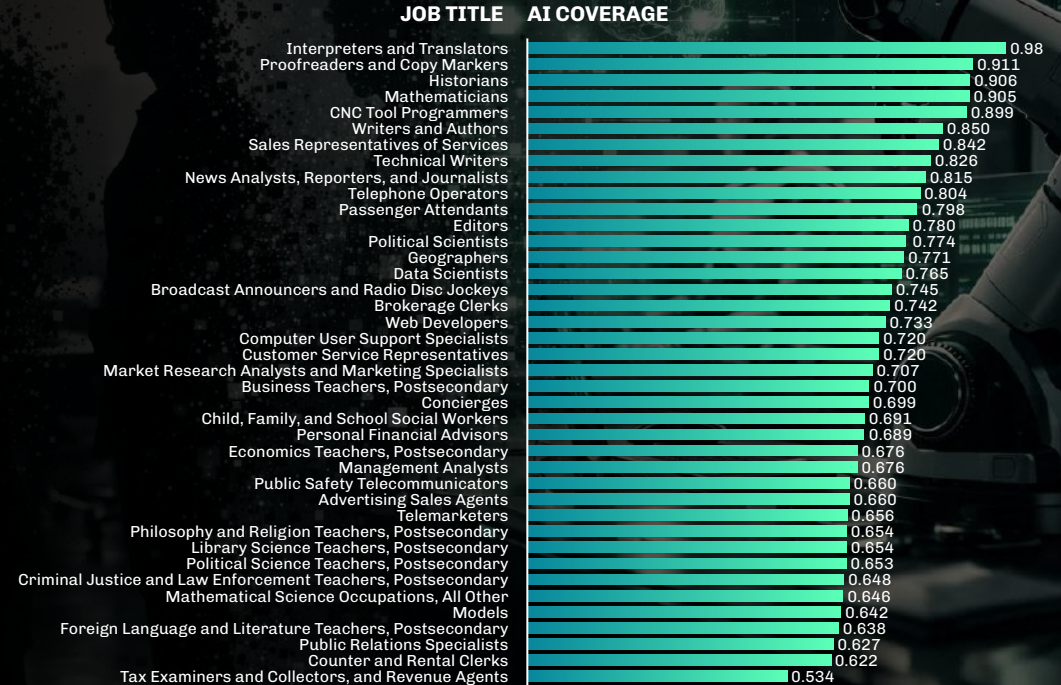
Microsoft cut 15,000 jobs in 2025 to "reimagine" the company for the new technological era.



**McKinsey & Company**

McKinsey & Co. planned to cut about 10% of its workforce (including 200 global tech jobs in November 2025), mainly in AI-supportable functions.

## TOP 40 OCCUPATIONS WITH HIGHEST AI APPLICABILITY SCORE



# THE ROBOTS HAVE ARRIVED

## AI-POWERED DRONE

Autonomously performs visual and thermal inspections, detecting faults and anomalies while streaming insights to technicians and other machines

## AUTONOMOUS HEAVY EQUIPMENT

Operates autonomously to perform specific tasks such as excavation, transport, and heavy material handling, using perception and AI models to work alongside humans and other machines

## HUMANOID ROBOTS

Perform inspection, maintenance, and manual tasks using human-like dexterity, enabling tool operation and work within existing environments

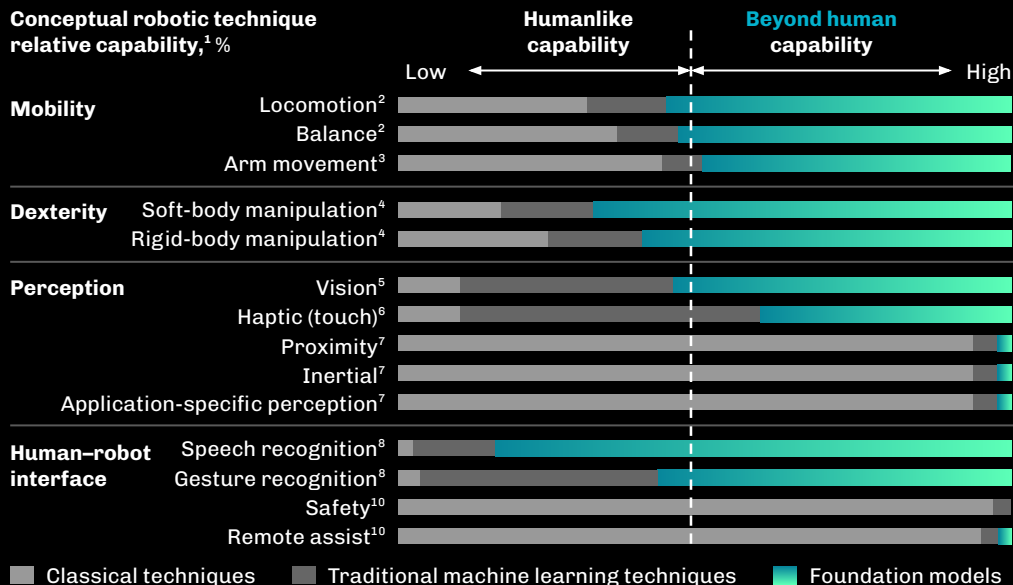
## HUMAN FIELD ORCHESTRATOR

Oversees AI agents and robots. Coordinates maintenance plans, trains robots, and ensures safety, compliance, and performance across sites and workflows

# THE CONVERGENCE OF CAPABILITY, COST, CAPITAL, AND NEED

Advances in embodied AI have pushed robots beyond scripted automation into adaptive, generalizable behavior.

AS FOUNDATION MODELS IMPROVE, THEY COULD POTENTIALLY ENABLE ROBOT CAPABILITIES THAT EQUAL OR EXCEED THOSE OF HUMANS.



**Robotics-Optimized Reasoning Models**  
Structured reasoning architectures enabling logical inference, model-based planning, and long-horizon decision-making under physical constraints

**Vision-Language-Action Policies**  
End-to-end models that learn skills via demonstration, language, and corrective feedback and generalize across environments

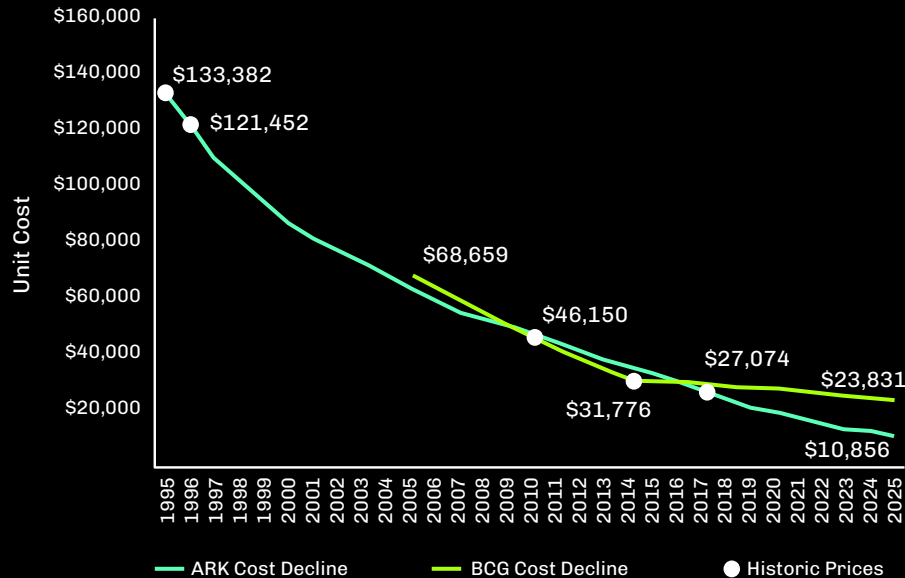
**Always-On Intelligence**  
200x drop in model inference costs has made continuous, real-time robotic reasoning economically viable

<sup>1</sup>Based on expert opinions. <sup>2</sup>Traditional machine learning (ML) techniques allow robots to nearly reach this humanlike capability, but foundation models are needed to surpass it. <sup>3</sup>Traditional ML techniques are sufficient to reach superhuman ability. <sup>4</sup>Foundation models are essential even to match human ability. <sup>5</sup>Traditional ML techniques (eg, convolutional neural networks) allow robots to nearly reach this human ability, but foundation models are needed to surpass it. <sup>6</sup>Traditional ML techniques (if complemented by hardware advances) are sufficient to reach superhuman ability; foundation models can help but are not essential. <sup>7</sup>Classical software (less advanced than ML) is sufficient to exceed human ability since the bar for human ability is quite low. <sup>8</sup>Foundation models are essential to exceed human capability; state-of-the-art large language models have already likely exceeded baseline human ability. <sup>9</sup>Foundation models are essential to exceed human capability; state-of-the-art vision language models have already likely exceeded baseline human ability. <sup>10</sup>Limited scope for ML or foundation models since classical techniques have already exceeded human baseline for safety. Source: McKinsey & Company, "Robotics grasps new possibilities" (September 2025)

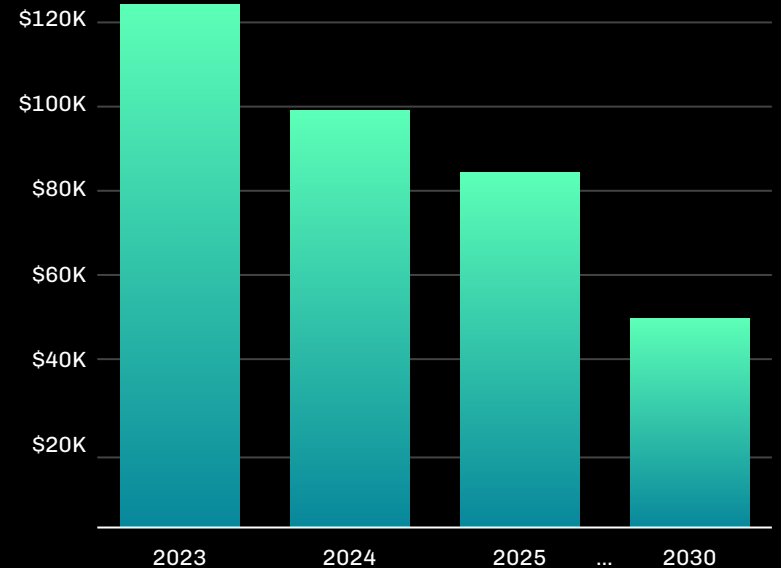
# THE CONVERGENCE OF CAPABILITY, COST, CAPITAL, AND NEED

Between 2022 and 2024, BOM costs have fallen by roughly 40%. They are projected to decline another ~50% by 2030.

### Industrial Robot Cost Decline (2017 Dollars)



### The cost of building an autonomous vehicle is set to fall

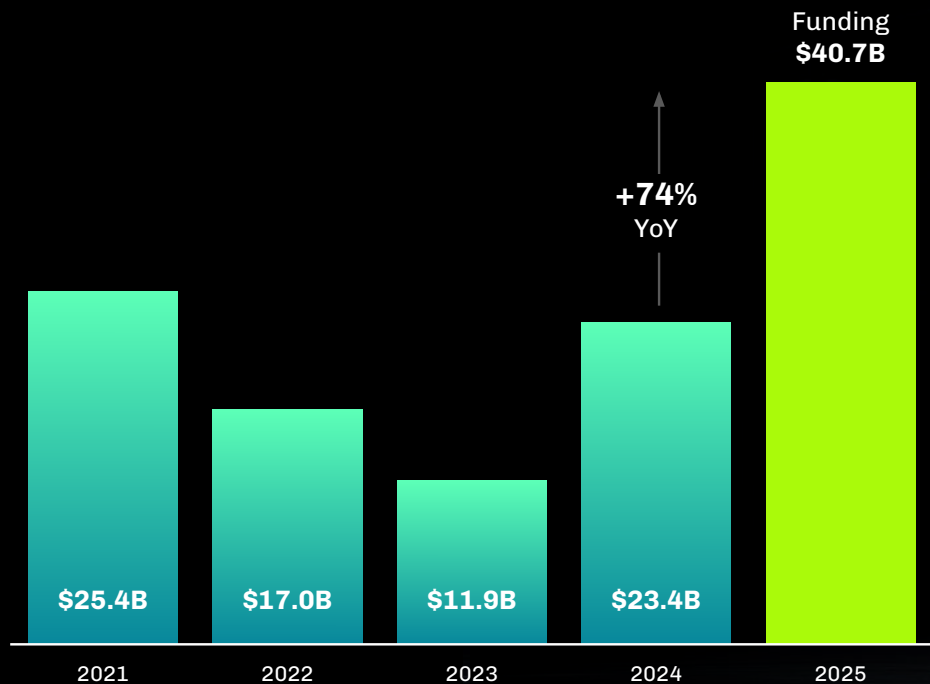


Sources: ARK Investment Management LLC (2019); Boston Consulting Group, "How Robots Will Redefine Competitiveness" (September 2015), based on data from United Nations Economic Commission for Europe; International Federation of Robotics; Sirkin, Hal, et al.

Note: Figures for 2024 onwards represent analyst estimates  
Source: Goldman Sachs, K. Hamlin (April 2025)

# THE CONVERGENCE OF CAPABILITY, COST, CAPITAL, AND NEED

A record-breaking ~\$41B in 2025 fundraises are accelerating robotics from lab prototypes to industrial deployment.



scale

\$14.8B

Meta acquired 49% |  
6/11/25

FIGURE

\$1.0B

Series C | 9/16/25

APPTRONIK

\$0.9B

Series A | 2/11/26

Helsing

\$0.7B

Series D | 6/16/25

Physical Intelligence ( $\pi$ )

\$0.6B

Series B | 11/20/25

Applied Intuition

\$0.6B

Series F | 6/7/25

# THE CONVERGENCE OF CAPABILITY, COST, CAPITAL, AND **NEED**

Aging workforces, chronic vacancies, and operational volatility are pulling robotics into the industrial mainstream.

Goldman: U.S. manufacturing labor surplus/(shortage), million people



“The limiting factor for the economy is labor.”

— Elon Musk

# A NEW ERA OF ROBOTICS IS ACCELERATING HIGH-MIX, LOW-VOLUME WORKFLOWS

## ROBOTICS 1.5 (PRE-2023)

Deterministic models

Best in structured environments. Edge-cases require heavy pre-training

Commercial pilots after 10 years and \$683M raised

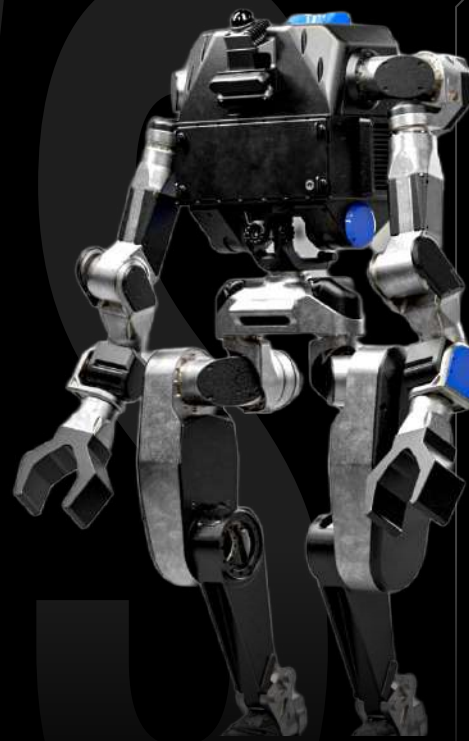


## ROBOTICS 2.0 (POST-2023)

Vision-Language-Action (VLA) models

Semantic reasoning adapts well in unstructured environments

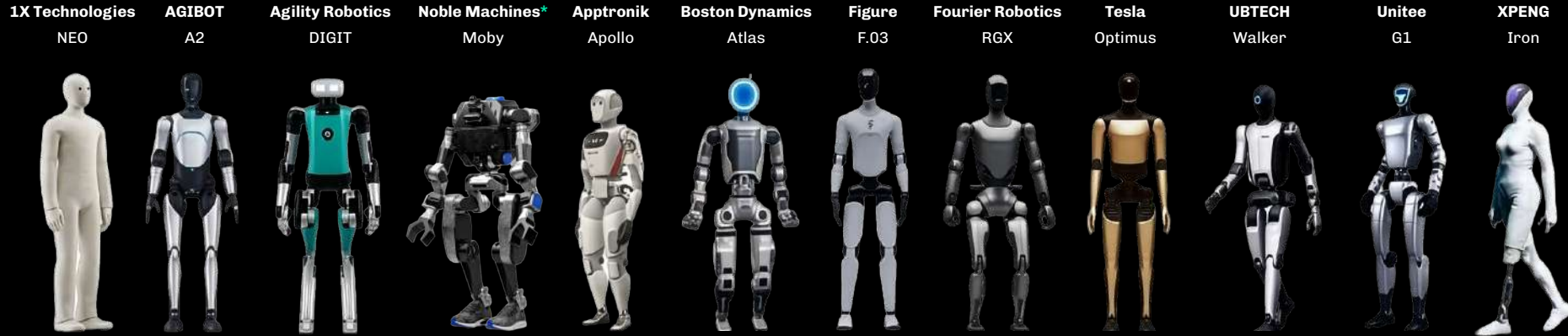
Commercial pilots after 1 year and \$12M raised



# HUMANOIDS ARE HERE TO BRIDGE THE GAP

Over 60 humanoid robots have entered the generalizable robotics competition.

## GENERALIZABLE ROBOTICS



### FIGURE

Raised >\$1B Series C at \$39B valuation. Announced BotQ, a 12k humanoid-per-year production line

### Noble Machines

Noble Machines\* became one of the fastest humanoids to commercialize, with robots operating at customer sites just 18 months after inception

### BostonDynamics






At CES 2026, Boston Dynamics officially launched the production version of Atlas

### TESLA

Optimus cemented as the future of Tesla: Musk stated will be 80% of Tesla's value, billions of units, while Model S/X wind down

# HUMANOID LABOR COST OF ~\$1/HR

 Factor	 Details	 Cost
Purchase Price	\$30k amortized over 5 years	\$500/month
Software Fee	Monthly Subscription	\$199/month
Total Monthly Cost		\$699/month
Daily Cost	Assuming 30-day month	\$23.30/day
Hours Available/Day	75% of 24 hours	18 hours
Cost per Hour		\$1.29/hour



# FUNCTION OVER FORM: SOME OF THE BIGGEST INDUSTRIAL ROBOTICS WINS WON'T BE HUMANOID

## CONSTRUCTION

Bedrock raised \$270M Series B to pave way for autonomous excavators



Teleo controls multiple machines simultaneously and was acquired by HavocAI



## AGRICULTURE

John Deere revealed next-gen autonomy platform, extending autonomy from tillage into spraying, orchards, and more



Orchard Robotics raised \$22M to help growers manage crops more precisely



## TRUCKING & DELIVERY

Waabi raised \$1B in new funding to scale its self-driving truck platform and expand its partnership with Uber



Gatik has completed >60k driverless orders with more than \$600M in contracted revenue



## MANUFACTURING

UnitX\* has inspected >\$15B in manufactured parts, automating the critical role of manual defect detection



Hadrian raised an additional \$260M for AI-powered factory expansion



# ROBOTICS ARE EXPANDING BEYOND THE INDUSTRIAL SECTOR

## HEALTHCARE

The promise of the best surgeon anywhere in the world



Intuitive Surgical launched its 5th generation of the da Vinci adding AI-assisted motion for the first time

10k systems deployed with 2M+ procedures performed annually



Researchers at Johns Hopkins demonstrated the first AI-driven soft-tissue surgery with no human intervention

## IN THE HOME

Matic raised \$30M for AI-driven cleaning robots



Bot Company raised \$150M with aim to create home robots that will assist people with everyday tasks



Sunday exited stealth and raised \$165M Series B for their home robot

## FOOD & BEVERAGE

Chef robotics raised \$43M



Hyphen raised \$25M to automate the makeline, in partnership with Chipotle and Cava



Miso Robotics launched its Next-Generation Flippy Fry Station, and is deployed in ~100 White Castles



## HOSPITALITY

LG Electronics acquired a majority stake in Bear Robotics for over \$60M



1X Technologies has raised over \$136 million for its housekeeping robot Neo



# THE COMMODITIZATION OF ENGINEERING AND MANUFACTURING WILL BRING CONSEQUENCES, BUT THE END OF WORK HAS BEEN “IMMINENT” SINCE THE 1920S

## THE FEAR:

Automation compresses the need for human labor, triggering mass unemployment and civil unrest. Every generation believes “this time it’s different.”

## THE REALITY:

Humans adapt. The invisible hand creates new industries faster than it destroys old ones. Every generation inherits higher global living standards and less extreme poverty.

1920s >>



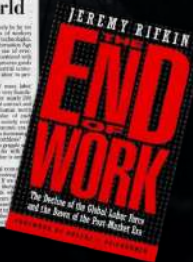
1940s >>



<< 1960s



1980s >>



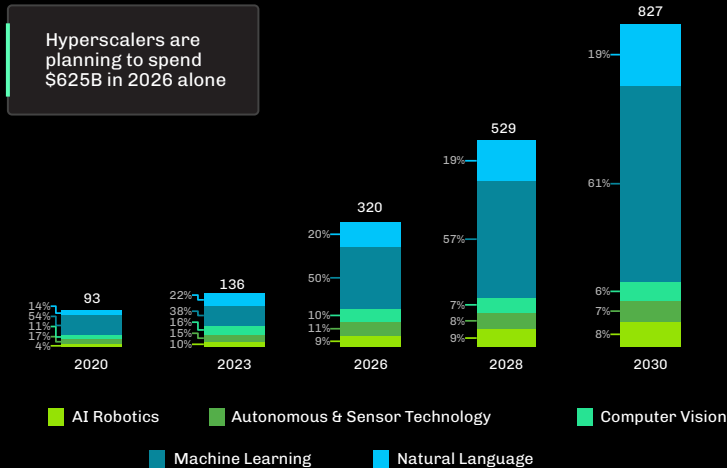
2000s



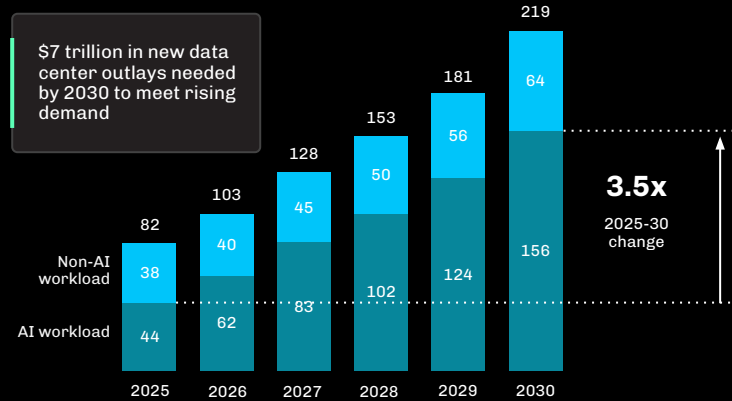
# AI'S COMPUTE BOOM IS DRIVING AN UNPRECEDENTED DATA CENTER BUILD CYCLE

AI workloads are materially more compute- and power-intensive, forcing hyperscalers and new entrants into a rapid global capacity expansion cycle.

AI global market size forecast, USD bn



Estimated global data center capacity demand, gigawatts



## Alphabet

Alphabet expects 2026 capital expenditures to be in the range of \$175 billion to \$185 billion

## Microsoft

Microsoft expected to double its data center footprint over next 2 years; FY26 capex of ~\$143 billion

## Meta

Meta targeting 15GW incremental U.S. capacity, committing over \$600 billion by 2028

## amazon

Amazon is deploying ~\$200B in 2026 to defend AWS leadership in the AI era

# WHILE AI BENEFITS ARE GLOBAL, THE INFRASTRUCTURE BURDEN IS OFTEN LOCALIZED

## GLOBAL GAINS

### Healthcare



- AI drug discovery timelines can be reduced from 5–10 years to 5-10 months
- DeepMind's AlphaFold predicted 200M+ protein structures (vs 180k discovered in all prior history)

### Education



- Translation models now support 100+ languages, enabling near-universal access to knowledge

### Agriculture



- AI-driven precision agriculture can increase crop yields by 10–25% and reduce fertilizer use by 20-30%

“With the help of AI, maybe we can cure all disease... within the next decade.”

— Demis Hassabis, CEO of Google DeepMind



## LOCAL CONSEQUENCES

In Mississippi, xAI is deploying 41 natural gas turbines to power its data center, generating **1.2GW of power** and emitting **~4M tons of CO<sub>2</sub> per year**

In California, health impacts from pollution associated with data centers **tripled from 2019 to 2023** and could rise by another **72% by 2028**

### THERMAL VIEW OF XAI'S MISSISSIPPI DATA CENTER



LENS 1  
ACCESS

LENS 2  
UNEQUAL BENEFITS/ HARMS

## LENS 3

### GEOPOLITICAL GAPS

In several critical industries, technology is developing faster outside of the United States than within it. Specifically, the US-China tech chasm is widening, creating strategic white space for other nations to occupy.

### CHINA'S INDUSTRIAL-SCALE CLEAN TECH DOMINANCE

China produces 6x the U.S.'s electric vehicle output, is home to the world's two largest battery manufacturers, and deploys ~\$400B annually into the energy transition.

### DEEPSEEK'S WAKE-UP

The U.S. bet export controls would cap Chinese AI. DeepSeek built a frontier model on restricted chips for a fraction of the cost.

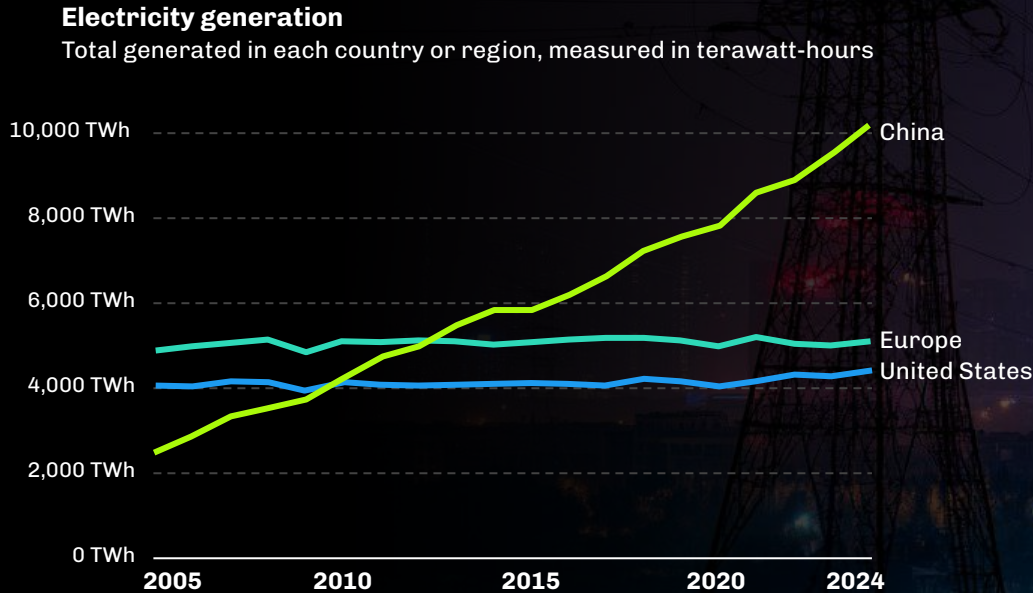
### THE SHIPBUILDING CHASM

China has 232 times the shipbuilding capacity of the United States.

### A COMPOUNDING TALENT GAP

China graduates 3.57M STEM students a year vs. 820k in the U.S. Foreign nationals make up a significant portion of U.S. STEM graduate degrees.

# CHINA'S ELECTRICITY GENERATION HAS SURGED MORE THAN 4x SINCE THE MID-2000S, NOW PRODUCING OVER TWICE THE POWER OF THE UNITED STATES



**China is the world's largest energy transition investor at over \$400B annually**, installing more solar and wind capacity than the rest of the world combined

**China is building ~30 new nuclear reactors** including the world's first commercial small modular reactor

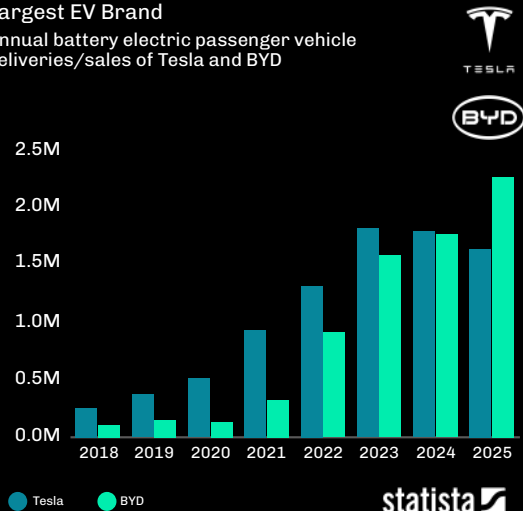
**China also holds ~60% of the world's manufacturing capacity** for renewable technologies, including solar PV, wind systems and batteries

# CHINA ISN'T JUST WINNING THE EV RACE, THEY ARE WINNING THE ENTIRE BATTERY & AUTO MARKET

BYD has overtaken Tesla as the world's top EV seller, outselling it for four straight quarters with vehicles priced at roughly half the cost

## BYD Surges Past Tesla to Become World's Largest EV Brand

Annual battery electric passenger vehicle deliveries/sales of Tesla and BYD



## 6 of the 10 largest battery producers are Chinese players

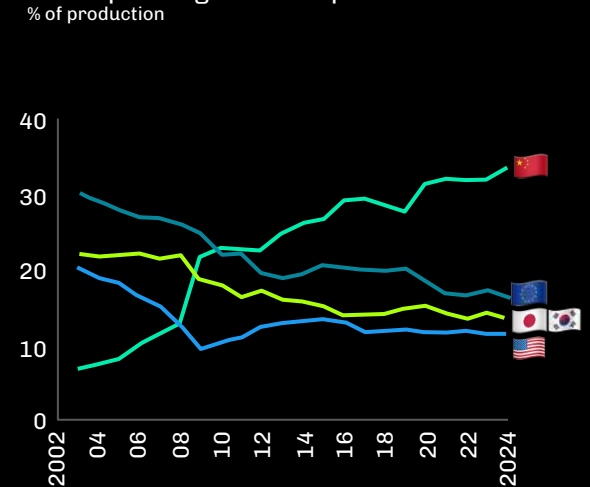
CATL and BYD alone control more than 50% of global Li-ion battery production

### Top 10 largest battery producers by market cap

CATL	
BYD	
LG Energy Solutions	
Guoxuan	
Panasonic	
EVE	
Samsung SDI	
SK On	
Gotion	
Sunwoda	

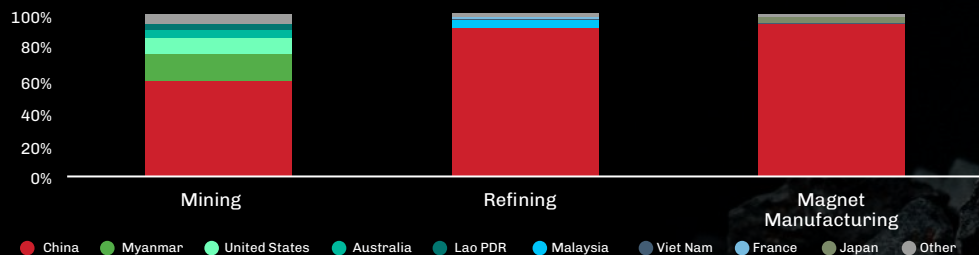
Since 2024, China has gained 18% of sales and 25% of production share for global passenger vehicles

## Global passenger vehicle production % of production



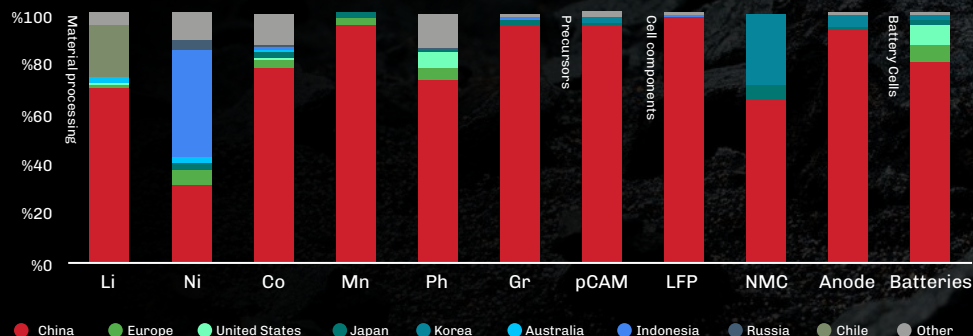
# CHINA DOMINATES THE UPSTREAM AND MIDSTREAM MINERAL SUPPLY CHAIN, CONTROLLING THE REFINING OF LITHIUM, COBALT, NICKEL, AND GRAPHITE AT SCALE

Regional composition of rare earths and permanent magnet production, 2024



China accounts for 94% of rare earth and permanent magnet production

The global midstream and downstream battery supply chain, 2024



China has a near monopoly in battery precursors, with shares of >95%

Source: IEA "With new export controls on critical minerals, supply concentration risks become reality" (2025)

# DEEPSEEK'S WAKE-UP CALL: THE U.S. BET EXPORT CONTROLS WOULD CAP CHINESE AI; DEEPSEEK BUILT A FRONTIER MODEL ON RESTRICTED CHIPS FOR A FRACTION OF THE COST

## THE U.S. ASSUMED EXPORT CONTROLS WOULD CAP CHINA'S FRONTIER AI PROGRESS...

### Biden Administration Clamps Down on China's Access to Chip Technology

The White House issued sweeping restrictions on selling semiconductors and chip-making equipment to China, an attempt to curb the country's access to critical technologies.

### U.S. Tightens China's Access to Advanced Chips for Artificial Intelligence

The further limits on shipments could cripple Beijing's A.I. ambitions and dampen revenues for U.S. chip makers, analysts said.

### Biden Targets China's Chip Industry With Wider Trade Bans

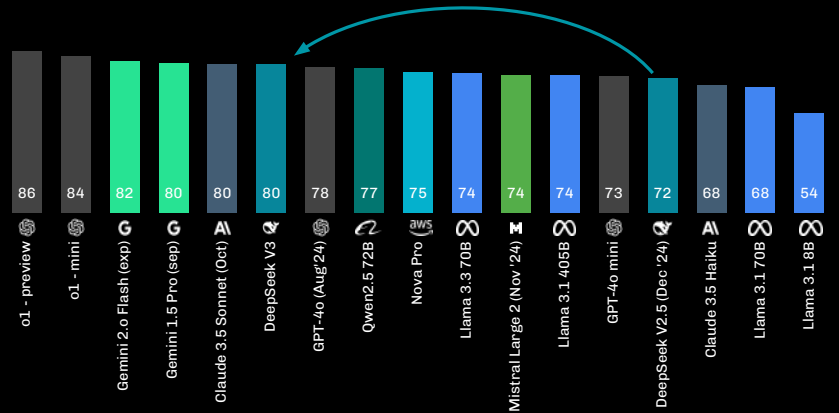
New rules significantly expand restrictions on selling China chip technology, but critics say they also contain carve-outs that are favorable to industry.

In 2022, 2023, and 2024, the Biden administration tightened China's access to state-of-the-art A100, H100, and Blackwell chips

## ...INSTEAD, DEEPSEEK TRAINED A FRONTIER-CLASS MODEL ON RESTRICTED HARDWARE & CLAIMED MATERIALLY LOWER TRAINING COST VS. WESTERN LABS

### Artificial Analysis Quality Index

Artificial Analysis Quality Index Includes MMLU, GPQA Diamond, MATH-500 and HumanEval; Evaluation results measured independently by Artificial Analysis; Higher is better




Performance in January 2025, upon Deepseek V3 release


"Deepseek R1 is one of the most amazing and impressive breakthroughs I've ever seen — and as open source, a profound gift to the world" —**Marc Andreessen**

# THE SHIPBUILDING CHASM: CHINA HAS 232 TIMES THE SHIPBUILDING CAPACITY OF THE UNITED STATES


China's shipyards have a capacity of ~23M tons versus less than 100k tons in the United States.

 Chinese shipbuilding capability



 U.S. shipbuilding capability



 = 100,000 gross tons

The Trump administration has made shipbuilding a stated strategic priority in 2025. However, rebuilding capabilities may take decades, not years.

“The erosion of U.S. and allied shipbuilding capabilities poses an urgent threat to military readiness, reduces economic opportunities, and contributes to China’s global power-projection ambitions.”

— Center for Strategic and International Studies

# CHINA IS ALSO DOMINATING GLOBAL MARITIME TRADE WITH MASSIVE INFRASTRUCTURE AND PORT INVESTMENTS

## China Is Investing in the Most Connected Countries

Top twenty countries or territories by shipping connectivity

Country or territory	Shipping connectivity Index, 2024 Q2 <sup>1</sup>	Total Chinese Investment in ports	Port projects
South Korea	640	\$1.2B	1
Singapore	586	\$2.6B	1
United States	504	\$161.9M	2
Malaysia	486	\$544M	2
Spain	425	\$454M	2
Japan	423	\$0	0
Vietnam	403	\$163.3M	2
United Kingdom	381	\$0	0
Netherlands	380	\$139M	1
Hong Kong	376	\$0	0
Belgium	343	\$39.1M	2
India	342	\$180.6K	1
Taiwan	340	\$0	0
Germany	305	\$76M	1
United Arab Emirates	296	\$227.5M	3
Italy	286	\$59.1M	1
Turkey	283	\$940M	1
Thailand	267	\$1B	2
France	263	\$446M	3
Morocco	263	No Data	3

“Chinese companies now own or operate terminals at more than 90 deep-water ports overseas, including 34 of the world’s 100 busiest.”

— Bloomberg

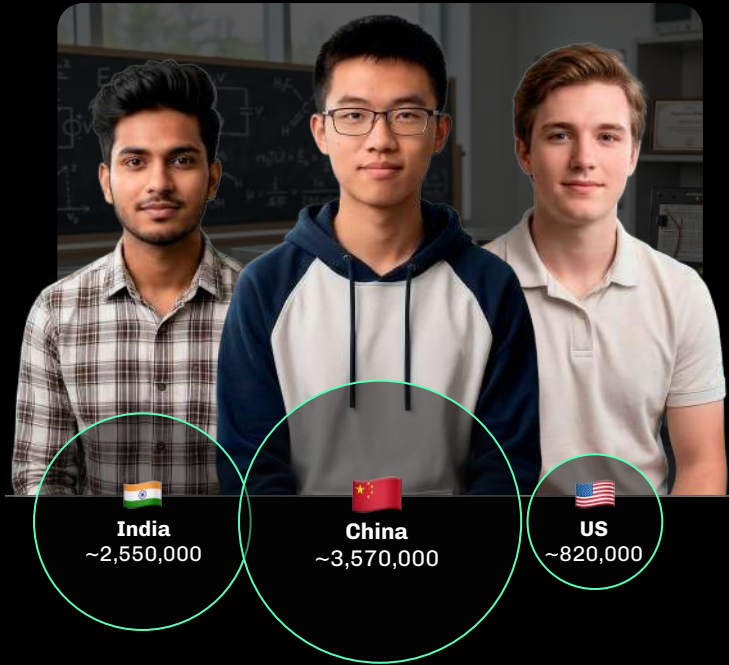
1. The shipping connectivity index is a measure of a country or territory’s integration level into global liner shipping networks  
Source: Council of Foreign Relations “Tracking China’s Control of Overseas Ports” (2024)

Source: Bloomberg “China’s Port Dominance Adds Strategic Leverage to Its Economic Reach”

# THE CHINA-U.S. STEM TALENT GAP IS WIDENING

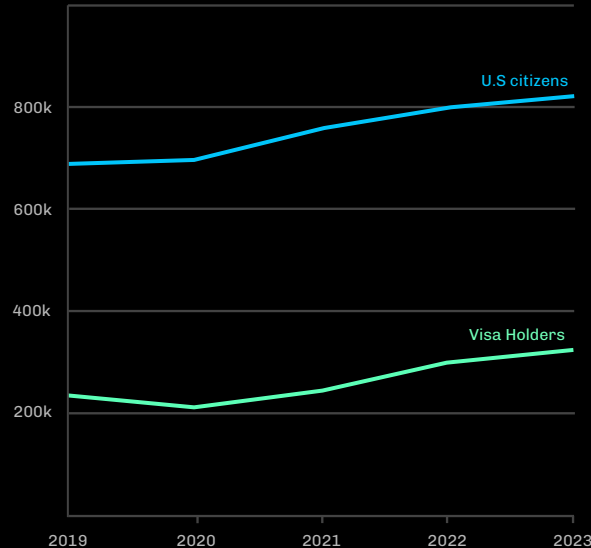
The talent pipeline gap between the U.S. and China is structural, measurable, and getting wider every graduation cycle

## Annual STEM Graduates (all levels)



The most aspirational career for American kids today is social media influencer. In 1971 it was astronaut.

## Over a Third of Graduates in U.S. STEM PhD and Master's Programs Are International Students



**Foreign-born STEM talent remains a core U.S. advantage.** The U.S. must continue to leverage its education ecosystem to win the rising competition for talent.

“The U.S. has a lead in brain power, but America’s edge is deteriorating dangerously.”

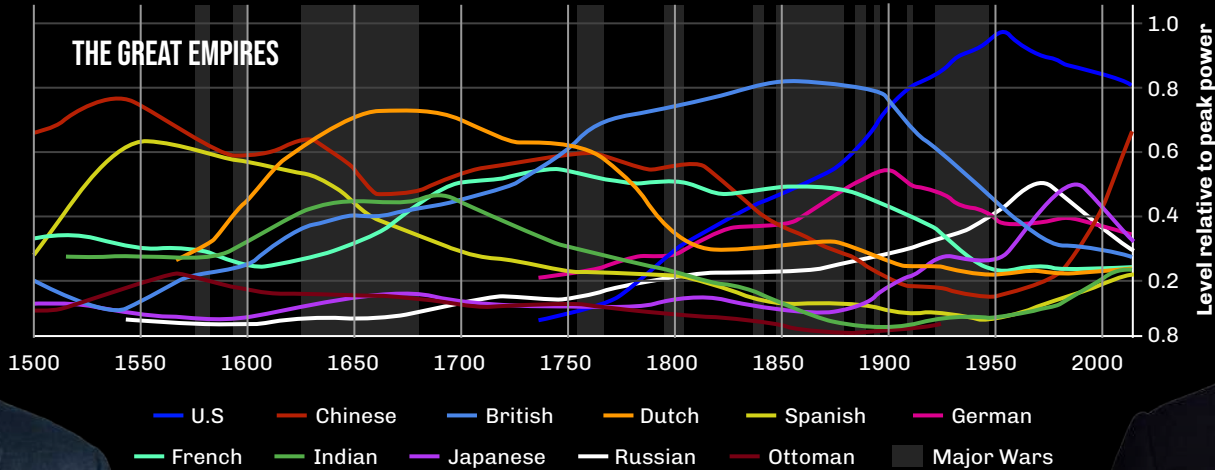
— Chris Miller, Author of *Chip Wars*

**AS TECHNOLOGICAL INEQUALITY  
COMPOUNDS BETWEEN THE U.S.,  
CHINA, AND “EVERYBODY ELSE,”  
NATION-STATES SEEK CONTROL.**

THE  
**KINETIC  
AGE**  
2026

# SOVEREIGNTY & THE RISE OF THE GCC

# A “RUPTURE” IN THE RULES-BASED INTERNATIONAL ORDER



“The world order is changing in big, disruptive ways that haven’t happened in our lifetimes but have happened many times before in history.”

— Ray Dalio, Founder, Chairman of Bridgewater Associates

“In a world of great-power rivalry, the countries in between have a choice: compete for favor or combine to create a third path with impact.”

— Mark Carney, PM Canada

# MIDDLE-POWER COUNTRIES ARE FORMING NEW COALITIONS TO SECURE SOVEREIGNTY ACROSS FOUR MAJOR INDUSTRIES

## 1. SOVEREIGN AI

Nations are building domestic AI stacks (compute, models, and data centers) to reduce dependence on U.S. hyperscalers and secure strategic control of digital infrastructure.

## 2. SOVEREIGN ENERGY

Electrification is reshaping global power dynamics as nations race to secure domestic capacity in renewables, batteries, nuclear, and the grids that power the AI economy.

## 3. SOVEREIGN SPACE

Governments are seeking independent access to orbit as reliance on privately controlled satellite networks raises new questions of security and autonomy.

## 4. SOVEREIGN MANUFACTURING

Countries are investing heavily in domestic industrial capacity — the foundation required to compete across AI, energy, space, and the broader physical AI stack.

**Strategic alliances marshal natural resources & capital beyond traditional U.S. leadership**

COALITION OF THE WILLING



CRITICAL MINERALS ALLIANCE



BRICS



I2U2



# SOVEREIGN AI: EVERY MAJOR NATION NOW DEMANDS INDEPENDENCE FROM U.S. HYPERSCALERS



India commits to a **\$11B fund** aimed at bolstering domestic chipmaking and developing LLMs in local languages.



South Korea is tripling AI investment to **\$7B**, seeking to build a national AI supercluster.



Japan invests **\$13B+** in subsidies to revitalize its status as a semiconductor powerhouse.



French public investment bank commits **€10B** to develop domestic foundation models and infrastructure.



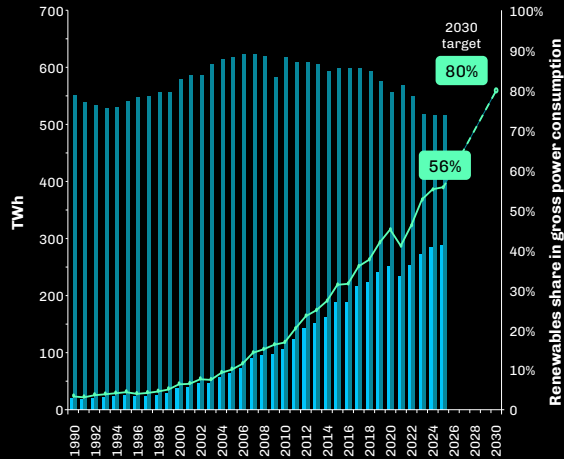
China's hyperscalers expected to invest **\$70B** into data centers next year.

# SOVEREIGN ENERGY: THE NEW OIL

Electrification is disrupting historic power dynamics between petrostates and vassal states.

## RENEWABLES

Germany hits 56% renewable energy after Russia/Ukraine disrupted natural gas supply



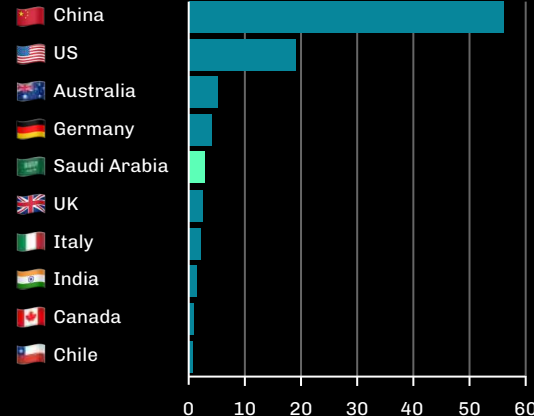
■ Germany Renewable electricity generation  
■ Germany Gross electricity consumption  
— Renewables' share

## BATTERIES

Saudi Arabia a new global leader in storage capacity



### Top 10 countries for battery storage in 2025 (GW)

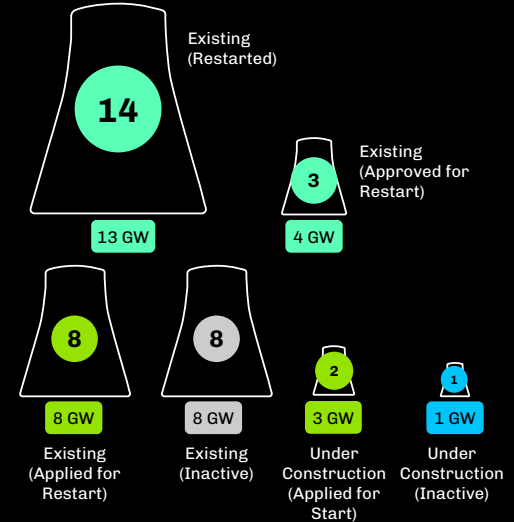


## NUCLEAR

Japan is restarting 25 of its 33 nuclear reactors post-Fukushima



### Japan's Nuclear reactors (2025)



# SOVEREIGN SPACE: THE LOW EARTH ORBIT (LEO) ECONOMY

Nations are increasingly uneasy about depending on Elon for satellite coverage.



The startup ecosystem is responding.



Raised \$130M to develop GPS with 2cm accuracy (100x improvement)



Raised \$830M to provide dedicated broadband to Taiwan, Oman, Philippines, Mexico, etc.



AscendArc won \$59M to deliver 500 Gbps internet to South Korea (in GEO)



Founded by former GC of SpaceX and LucasFilm, building a Starlink competitor for sovereign nations (Brazil, Spain, Portugal, Turkey, etc).

# SOVEREIGN MANUFACTURING: THE FACTORY IS THE PRODUCT



Countries like India are investing heavily to build out a self-sufficient domestic industrial base. Manufacturing has a high economic multiplier effect: every \$1 invested generates >\$2.6.

**\$24B** Investment

**\$225B** Incremental Production

**1.2M** Jobs

Apple moves to ~~China~~ India

Electronics Manufacturing **up 11x**



U.S. startups are “containerizing” cutting-edge manufacturing technologies to export to allied nations.

Startups like Machina Labs provide cutting-edge manufacturing technology (e.g. roboforming sheet metal) which can be shipped overseas in an intermodal container.



After meeting at the UP Summit 2025, Abu Dhabi's SDF invested \$35M into the Machina Labs Series C.

# IN THIS CONTEXT... A THIRD NODE EMERGES

The GCC is a 4-hour flight to 3.5B+ people and <100ms latency from most European capitals.

## U.S.-China Dual Access Arbitrage

### Technology

The GCC is a neutral innovation hub which benefits from both American technology and the Chinese supply chain.

### Talent


The region attracts talent from both Western and Asian markets. UAE's Golden Visa program has grown 900% since 2020.

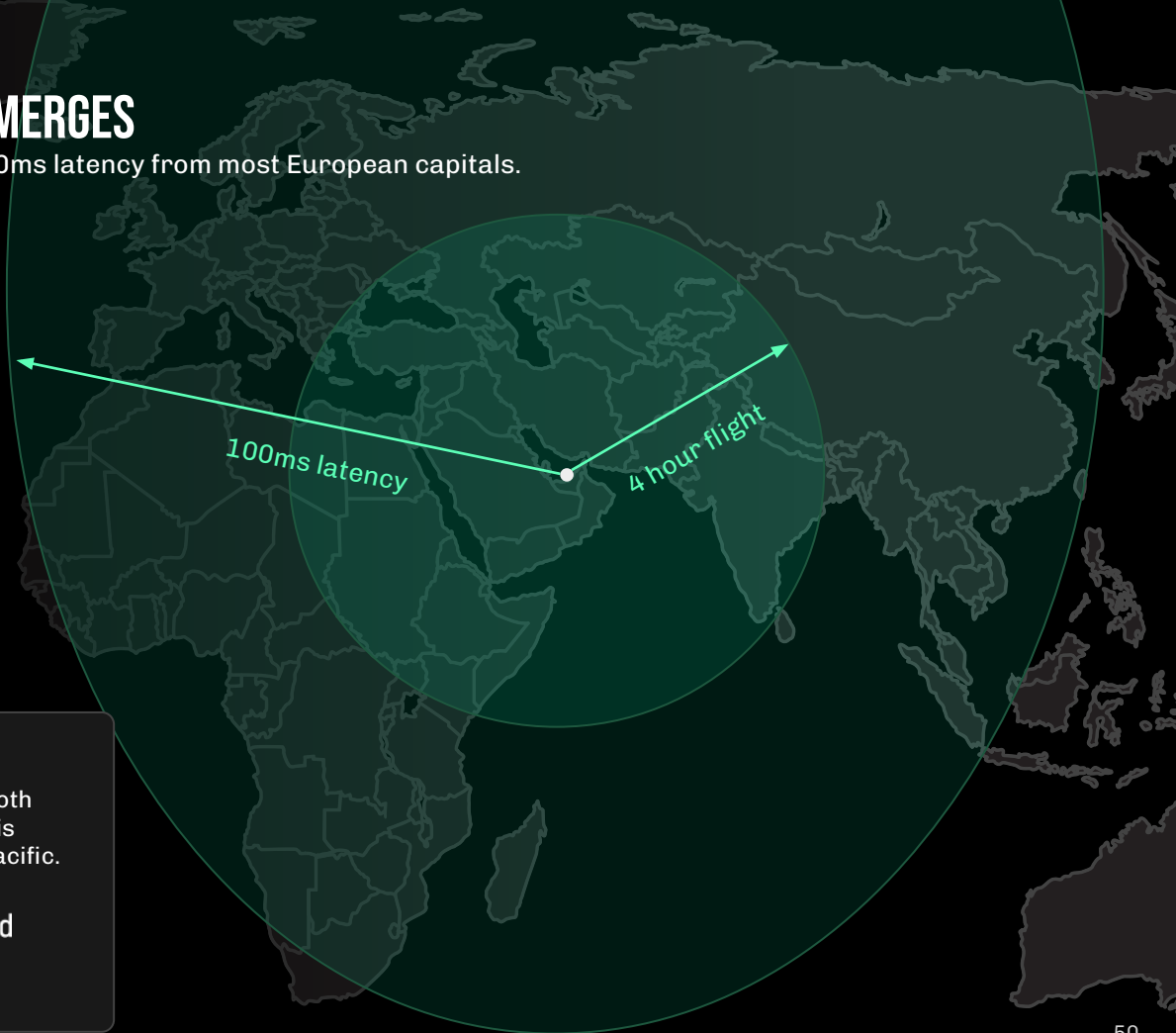
### Trade

The Gulf maintains commercial relationships with both Washington and Beijing. For example, Saudi Arabia is investing in AI infrastructure on both sides of the Pacific.



 Google AI  
\$10B

 Alibaba Cloud  
\$230-500M



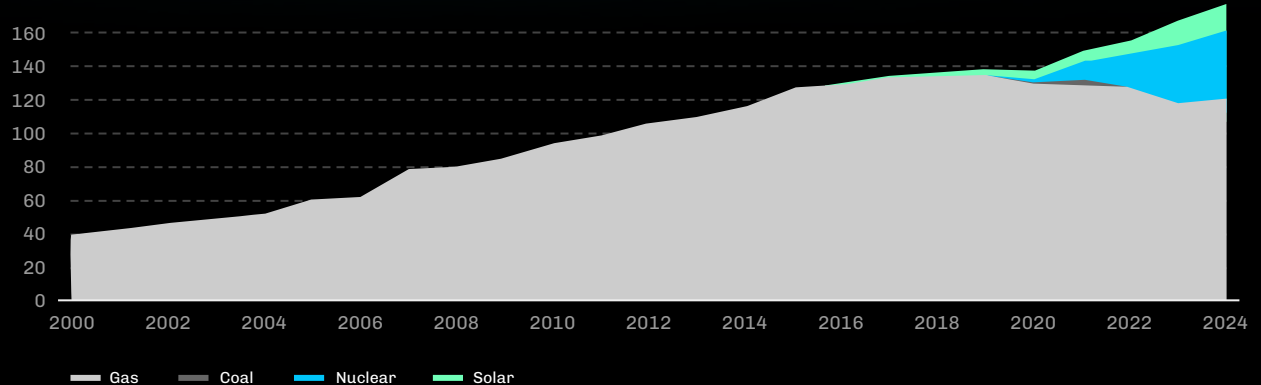
# NUCLEAR IN THE UAE

The UAE has embarked upon a nuclear power program in close consultation with the International Atomic Energy Agency and with huge public support.



Electricity demand is rising in the UAE, which relies entirely on power-intensive desalination to produce potable water. Per capita electricity consumption has increased from about 11,400 kWh in 2000 to about 15,700 kWh in 2022.

United Arab Emirates electricity generation by source (TWh)



# AI IN THE UAE

The UAE was an early-mover, anointing the world's first Minister of AI in 2017 who has mobilized sovereign capital to catalyze AI commitments and partnerships at unprecedented scale and speed.

  Microsoft    OpenAI

Abu Dhabi's Group42 intends to deploy \$100B to develop AI across healthcare, finance, and energy in partnership with Western firms like Microsoft, BlackRock, Oracle, and OpenAI.

**STARGATE UAE**  NVIDIA

In May 2025, G42 announced that Abu Dhabi will host **the largest data center on earth**, deploying 500,000 Nvidia H100 chips per year to deliver 5GW of compute.



UAE's Minister of AI, Omar Sultan Al Olama, spoke at UP Summit '23 about the Gulf's structural advantages in the global AI race.

# THE NEW CAPITAL GEOGRAPHY

Sovereign wealth funds are fundamentally restructuring the traditional venture capital stack.

Middle East sovereign capital has become the life-saving marginal dollar for Physical AI companies beyond the Series B.

  
APPTRONIK




Qatar Investment Authority  
led \$520M Series A+

  
BETA



Qatar Investment Authority  
led \$318M Series C

  
ARCHER




Abu Dhabi Investment Office led  
"multi-hundred-million dollar"  
framework agreement

  
AXIOM  
SPACE



Aljazira Capital (Saudi Arabia)  
led \$350M Series C

  
MUBADALA

Gulf SWFs deployed \$136 billion globally in 2024, representing 54% of all sovereign capital flows. Mubadala alone wrote \$29 billion across 52 direct deals.

# NOT JUST NATIONS: NEW MEXICO IS CREATING A NATION-SIZED INDUSTRIAL POLICY

The New Mexico State Investment Council (NMSIC) is the second largest sovereign wealth fund in the U.S.

New Mexico is cutting red tape, attracting world-class talent and surgically deploying capital into DeepTech

These incentives are life-or-death for CapEx hungry startups across Energy, Defense, and Quantum

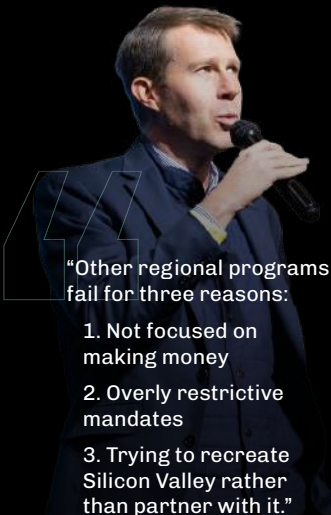


NMSIC oversees **\$70B+** of assets. They have quietly built the largest regional venture capital program in the country:

**\$1.9B**  
across

**30+** top venture firms

Fund managers make a commitment to invest in companies operating in or expanding to New Mexico.



“Other regional programs fail for three reasons:

1. Not focused on making money
2. Overly restrictive mandates
3. Trying to recreate Silicon Valley rather than partner with it.”

**Chris Cassidy,**  
NMSIC Director, VC/PE



**Pacific Fusion chooses Albuquerque for its \$1B research campus**



The project will create 200 permanent jobs, generate tax revenue, and expand STEM education across the state

*Castelion*  
**Castelion has selected New Mexico for its 1000-acre hypersonics manufacturing campus**

The initiative will generate over \$650M in economic output and create 300 high-quality jobs

As technology continues to shift from bits to atoms, innovative governments like the UAE and New Mexico will play a vital role in ushering technology across the Valley of Death.

**EVEN AS MIDDLE POWERS RISE,  
U.S.-CHINA GREAT POWER COMPETITION IS  
CATALYZING A RENEWED PUSH FOR  
AMERICAN INDUSTRIAL INDEPENDENCE.**

A photograph of an industrial facility at night, featuring large pipes, walkways, and numerous warm lights that create a bokeh effect in the background. The scene is dark, with the lights providing the primary illumination.

THE  
**KINETIC  
AGE**  
2026

# REINDUSTRIALIZE THE WEST

# THE CANARY IN THE LITHIUM MINE: CHINA SANCTIONS SKYDIO

In 2024, China unilaterally sanctioned UP.Partners portfolio company Skydio, threatening its battery supply chain and raising awareness to critical supply chain vulnerabilities.



**CHINESE SUPPLIERS UNDERPIN FOUNDATIONAL COMPONENTS ACROSS AEROSPACE, AUTOMOTIVE, ROBOTICS, INFRASTRUCTURE, AND DEFENSE**

# THE ELECTRO-INDUSTRIAL STACK WILL DEFINE THE 21ST CENTURY

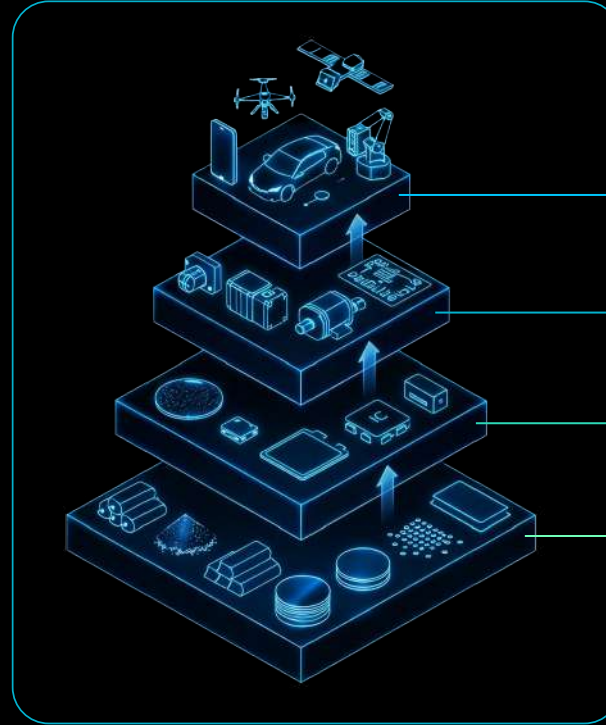
The most consequential industries of the modern era are becoming increasingly electrified.

EVs, drones, robotics, grid storage, satellites, missiles, data centers, etc. all rely on the same:

Increasing geographic concentration, more supply chain risk

- Semiconductors
- MEMS
- Magnets
- Batteries
- Precision manufacturing
- Power electronics
- And more

**Countries that do not have sovereignty over this tech stack cannot fully participate in the next generation of economic growth.**



**END PRODUCTS**

Finished systems integrating many modules

**MODULES & SUBSYSTEMS**

System-specific functional modules assembled from standardized components

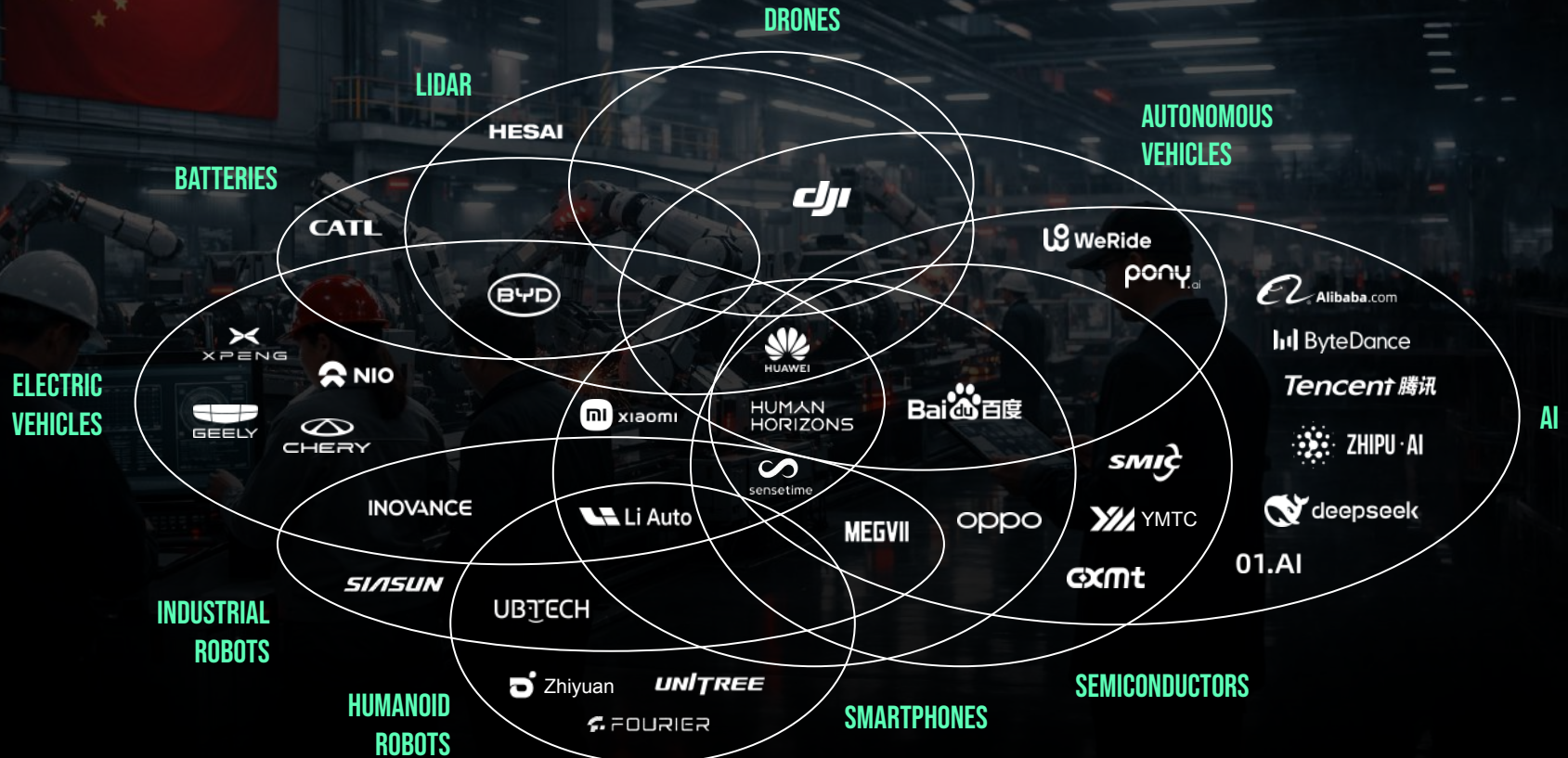
**DEVICE PRIMITIVES & COMPONENTS**

Components produced at massive global scale

**RAW MATERIALS**

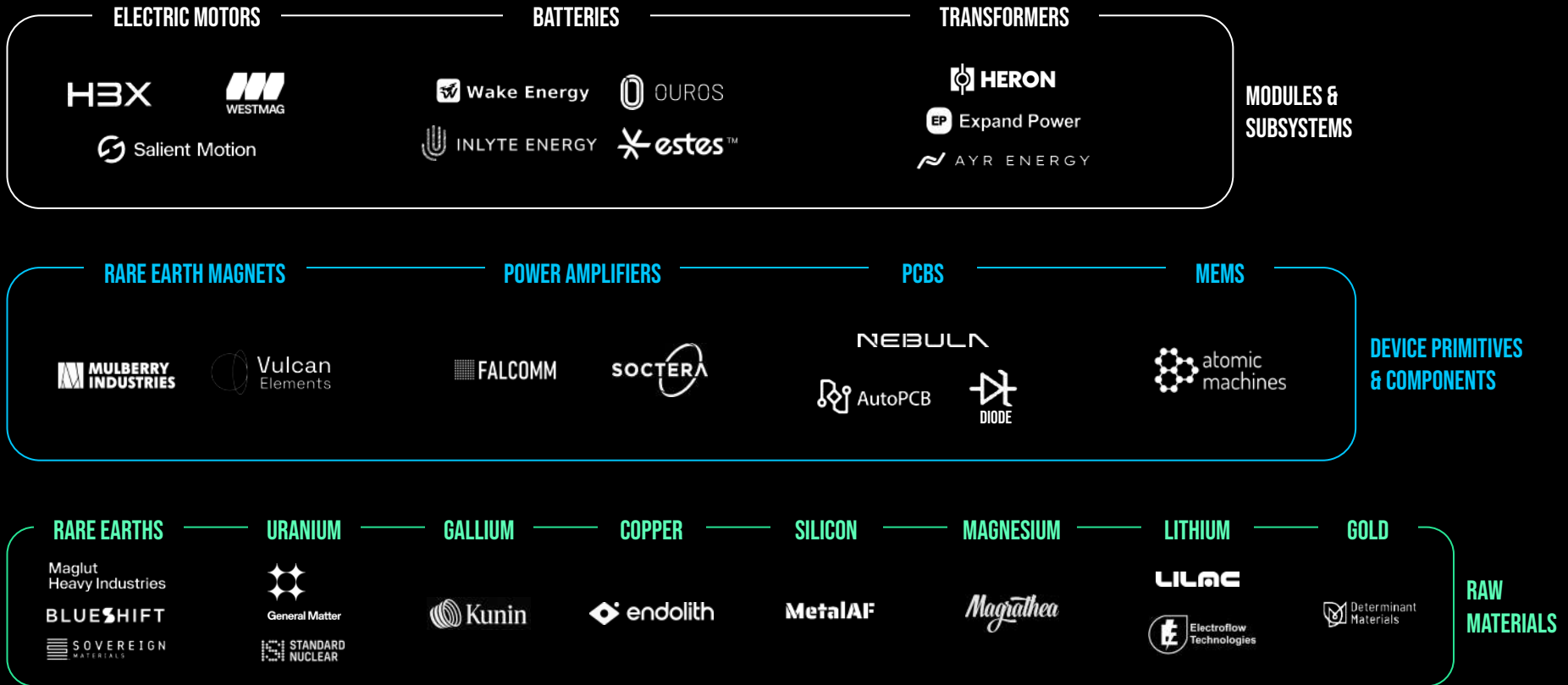
High-volume extracted and refined inputs used across nearly all industries

# TODAY, CHINA DOMINATES THE ELECTRO-INDUSTRIAL STACK



# U.S. STARTUPS ARE RACING TO RESOLVE THESE VITAL VULNERABILITIES

UP.Partners has met dozens of startups building out the ex-China, electro-industrial supply chain.



# REINDUSTRIALIZE HAS BECOME A CULTURAL AWAKENING

What started in 2024 with a few rebellious manufacturing geeks gathering in Detroit has exploded into one of the buzziest events of the year.

 REINDUSTRIALIZE

# 1,200

entrepreneurs, investors, policymakers, and service members are rallying around the call to revive America's crumbling industrial base.



REINDUSTRIALIZE Summit 2025:

**Palmer Luckey** delivered the keynote address via a humanoid robot he sent with his signature mullet & Hawaiian shirt.

# SOUTHERN CALIFORNIA EMERGES AS THE EPICENTER OF THIS NEW HARDTECH MOVEMENT

## El Segundo

Adjoint  
AirClient  
Amec  
Amidon Heavy Industries  
Arbor  
Argo Space  
Ares Industries  
Blue Origin  
Cambium  
CesiumAstro  
CHAOS Industries  
Charter  
CX2  
Dirac  
Drone Forge  
Durin Mining  
Electric Goddess  
EVgo  
First Resonance  
Galatin  
General Galactic  
GRAM  
HABIT  
HiveWatch  
Hyber  
Hybron  
Launchpad  
LISUS  
Long Wall  
Lumafield  
Lumaryl  
Magenta  
Matter Intelligence  
Metal Cross  
Morpheus Space  
Neros Technologies  
Nooks  
Odyssey  
Pacific Defense  
Picogrid  
Radiant  
Rainmaker  
Rangeview  
Roboze  
Second Order Effects  
Shinkei Systems  
Sift  
Singularity  
Skyryse  
Skyton  
Smack Technologies  
Soaring  
Space Kinetic  
Upgrade Energy  
Vanda Space Industries  
Viridian Space Corporation  
Vuecason

## Seal Beach

AstroForge

## Culver City

Avnos  
Clairity Technology  
HStar  
Nominal  
Observable Space  
Pinto Robotics  
reOrbital

## Santa Clarita

ATR-X

## Valencia

Jaco Aerospace

## Santa Barbara

Apeel  
Redwire  
Teledyne Flir  
Umbrá

## Camarillo

Energy Audit

## Thousand Oaks

Castheon  
Frontier Aerospace  
Epic Advanced Materials

## Oxnard

Swarm Aero

## Inglewood

Splash Industries  
Widget Makers

## Burbank

AM Creations  
Terraform Industries

## Pacoima

TransAstra

## Chatsworth

Machina Labs

## Mojave

Evolution Space  
Spin Garage  
Stratolaunch

## Gardena

Airwave  
Alpha King  
Cover  
Mesh Optical  
Motivo

## Santa Monica

BornForge  
Epsilon3  
Moonware  
Nevoya  
ZeitView

## Moorpark

EBAD  
PteroDynamics Inc.  
Quantum-Systems Inc.

## Simi V.

AV

## Westlake Village

InVia Robotics

## Malibu

Zoo

## Los Angeles

Airrow  
Downmass  
Ethos Space Resources  
Flyby Robotics  
Gambit  
Macro  
Quilter  
RFA Electric  
Rollup  
SysGit

## Downtown Los Angeles

Airship Industries  
Kyte Dynamics  
Parallel Systems  
Proteus Space

## Glendale

Glenair

## Pasadena

Atomic Industries  
Continuum Space Systems  
Ecliptic Enterprises  
Elementary  
Helicity Space  
HelioGen  
Motiv Space Systems  
RealDefense  
Rotor Vault

## Garden Grove

Auniga Space  
Harbinger Motors  
Orbital Outpost

## Monrovia

Planetary Utilities

## Redondo Beach

General Matter  
Impulse Space  
Senra Systems

## Torrance

AerospaceLab  
Antares  
AnySignal  
Aro Boats  
Broaddata  
Communications  
CarbonBuilt  
Castelion  
Claros  
Divergent  
Epirus  
FBC  
Fortastra  
GITAI  
Hadrian  
Heart Aerospace  
Inorbit Aerospace  
Intellisense Systems  
K2 Space  
Northwood Space  
Salient Motion  
Titan Dynamics  
Verus Aerospace

## Carson

Apogee Composites  
FlightWave Aerospace  
Systems MIMO Technik  
GrayMatter Robotics

## Venice

Stell

## San Gabriel

Hologram  
Pacific Light

## Rosemead

Cislune

## San Bernardino

Fenix Space

## Playa Vista

Apex Space Framework  
Automation Heavyside  
Industries Inversion  
Space Outpost Space  
Revel

## Costa Mesa

Anduril Industries

## Newport Beach

Dreamstar Lines

## Huntington Beach

Acceliot  
Adient Aerospace  
Archer Aviation  
Karman Space & Defense  
Layup Parts  
Mach Industries  
RossMerica  
Volund Manufacturing

## Irvine

AC Future  
Anduril Industries  
Field AI  
Menlo Micro  
Rivian  
Supernal  
Syntiant  
TRL11  
Turion Space  
Xsync AI

## Santa Ana

Anduril Industries  
APEX Space & Defense  
Kinetic  
Overair, Inc.  
TOMI Engineering

## Los Alamitos

Brelle

## Carlsbad

Airspace Technologies  
Aptera

## Hawthorne

Andrenam  
Critical Energy  
Freeform  
Gradient Robotics  
Hermeus  
Hgen  
Moleaer  
Oligo Space  
Phase Four  
Reflect Orbital  
SpaceX  
Starpath Robotics  
Thermopylae Aerospace  
Valar Atomics  
Vital Lyfe  
Venturi Astrolab

## Long Beach

Advanced Spade Co.  
AIBOT  
Airhart Aeronautics  
Ampaire  
Anduril Industries  
Carbon Capture  
Cofactr  
Coronal  
JetZero  
Karman Industries  
Long Wall  
M4 Engineering  
Mayman Aerospace  
NuSpace  
Odys Aviation  
Open X  
Orbital Operations  
Rebel Space Technologies  
Relativity Space  
Rocket Lab  
Spaceium  
SpinLaunch  
Starship Technologies  
True Anomaly  
Vast

## San Diego

Deepwater Exploration  
Firestorm  
Natilus  
Saronic  
Seasats  
Shield AI  
SkySafe

## Tustin

Virgin Galactic

## Vernon

Dyrt

## Cypress

Senra Systems

# EL SEGUNDO'S THIRD INDUSTRIAL RENAISSANCE

The once-sleepy aerospace town now hosts the highest density of defense and manufacturing startups in the country. Talent and capital are both flooding into "The Gundo" as Gen Z founders avow that "Gundo is to HardTech what Florence was for art."

## ARSENAL OF DEMOCRACY ERA

[1940S-1980S]



HUGHES

NORTHROP  
GRUMMAN

## NEW SPACE ERA

[2000S - 2010S]

SPACEX

## "THE GUNDO" ERA

[2023 -



RADIANT



NEROS

RAINMAKER

RANGEVIEW

PICOGRID



General Matter

MACH  
INDUSTRIES



VALAR  
ATOMICS

### NARRATIVE DISRUPTION:

It's easy to caricature the "Gundo Bro" founders as creatine-fueled hyper-nationalists. But we see something more meaningful behind the facade. These young entrepreneurs reject the frivolities of The Attention Economy. They came of age watching "Silicon Valley's most brilliant minds" optimize for clicks and engagement, poisoning an entire generation's habits in pursuit of ad dollars. Disillusioned, they are turning toward something very different: blue-collar grit, hard engineering problems, and the spirit of American ingenuity. Their ambition is not to build the next app, but to rebuild the country's industrial foundation. They systematically identify gaps in the U.S. industrial base and launch companies to fill them. These founders see themselves on a mission: to re-domesticate manufacturing, strengthen national resilience, and tackle consequential problems in defense, energy, and climate. Their message resonates with top engineering talent which yearns for work that feels tangible and world-positive. They find exactly that in El Segundo.

# REINDUSTRIALIZE IS NOW A FEDERAL PRIORITY

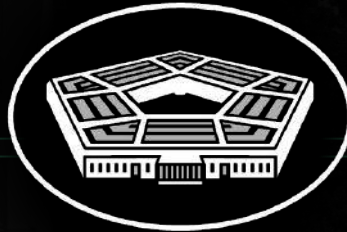
The U.S. government is making unprecedented investments in private companies in a bold effort to close the electro-industrial gap.



\$1.4B partnership with the U.S. DoW to build a domestic rare earth magnet supply chain.



The DoW took an equity stake in Mountain Pass, the only significant U.S. supply of rare-earths. Sets a price floor of \$110/kg (a ~33% premium) to catalyze the market



U.S. Department of War



~\$565M deal with Brazilian mine to diversify ex-China supply of rare earths. Includes option for minority equity stake.



Landmark \$8.9B investment to accelerate domestic semiconductor manufacturing. The U.S. Government took 9.9% equity stake.

# WHY CAN'T CHINA MAKE A JET ENGINE?

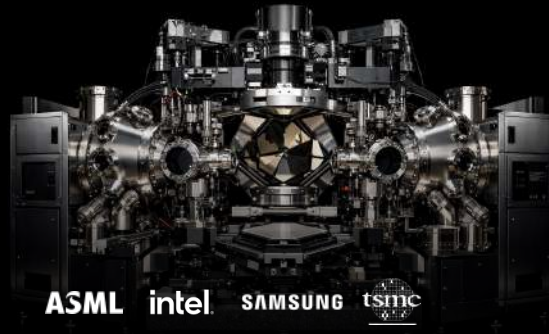
Despite China dominating on EVs, robotics, solar, and electronics, **The West still enjoys a lead on ultra-complex systems built upon decades of institutionalized knowledge.**



## HIGH BYPASS TURBOFAN JET ENGINES

Requires:

- **Decades of field data**
- Extreme material science (single-crystal superalloys, ceramics)
- Precision manufacturing at micron tolerances



## EUV LITHOGRAPHY & SEMICONDUCTOR FAB\*

Requires:

- **Decades of optical refinement**
- Ultra-precise mirrors
- Plasma light generation



## NUCLEAR SUBMARINES

Requires:

- **Decades of acoustic testing** to reduce signature
- Deeply classified knowledge
- Nuclear reactor designs

\* There are substantiated rumors that China is developing 100MW+ EUV, targeting 0.33NA (comparable to current-gen ASML)

# BUT IS U.S REINDUSTRIALIZATION ACTUALLY FEASIBLE?

Or is this all political pandering?

## Aging workforce, factories, and equipment

The median age of the U.S. worker in the aerospace supply chain is

**50** YRS OLD

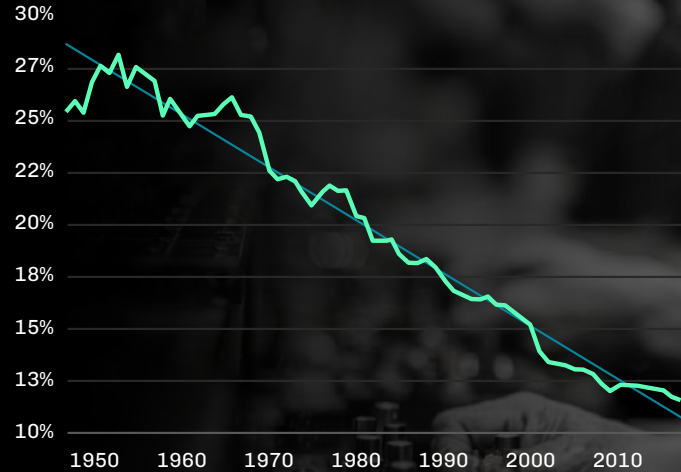
The average U.S. factory is

**25** YRS OLD

The average piece of equipment is

**9** YRS OLD

US Manufacturing's Share of GDP, 1947 to 2017



**TO REGAIN HARDTECH  
SUPERIORITY, THE WEST  
MUST LEAN ON AI.**

THE  
**KINETIC  
AGE**  
2026

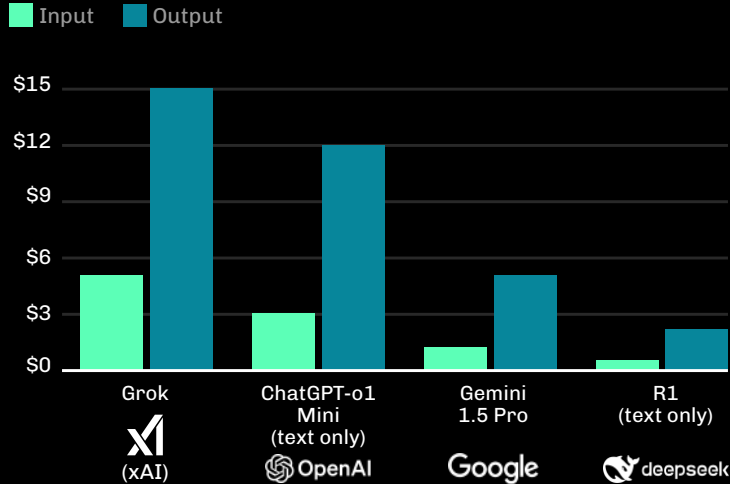
# THE CHATGPT MOMENT FOR HARDWARE

# THE OLD HARDWARE/SOFTWARE PARADIGM IS NO LONGER SUFFICIENT

## DIGITAL AI SPUTNIK MOMENT deepseek

### DeepSeek-R1 Upsets AI Market With Low Prices

Estimated price for processing one million input/output tokens on different AI models

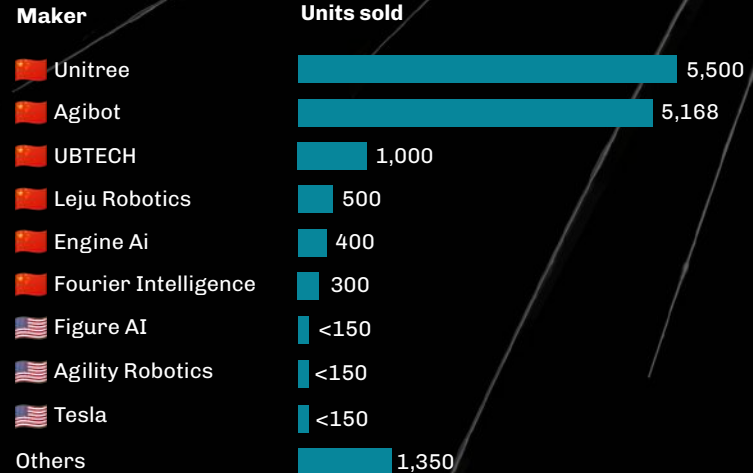


List includes the most comparable model to ChatGPT-o1 (state-of-art when Deepseek was released). Performance has since changed dramatically.

## PHYSICAL AI SPUTNIK MOMENT UNITREE

### Humanoid robot deployed in 2025

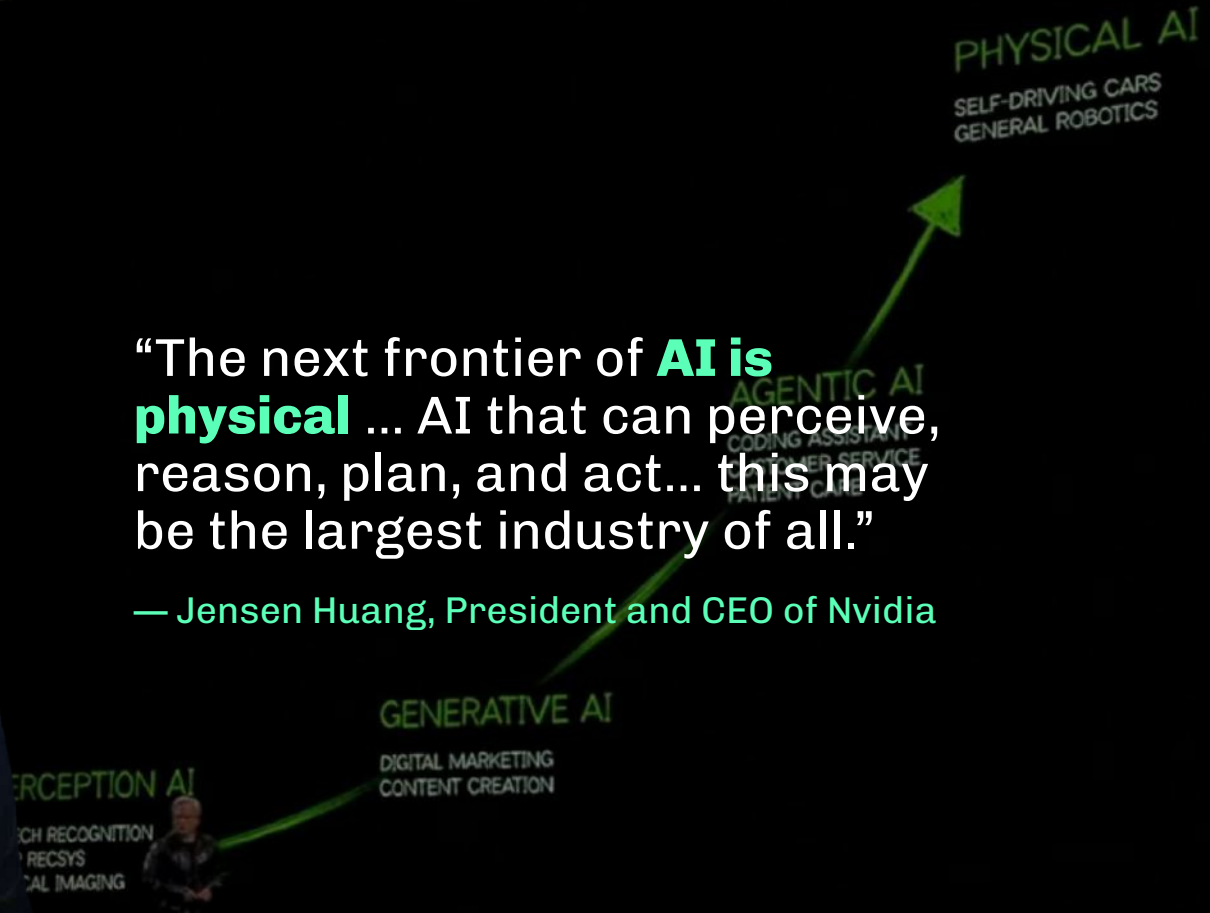
Nearly 90% of humanoid robots deployed globally last year were Chinese





“The next frontier of **AI is physical** ... AI that can perceive, reason, plan, and act... this may be the largest industry of all.”

— Jensen Huang, President and CEO of Nvidia



# ENGINEERING TOOLS ARE ENTERING A NEW 'INTELLIGENT' ERA

↑ Impact



**ANALOG**

Many:1

Many engineers work together to achieve one task



**DIGITAL**

1:1

One engineer owns and executes a single workflow



**INTELLIGENT**

1:Many

One engineer orchestrates an army of agents to design and fine-tune entire engineering projects

1980's

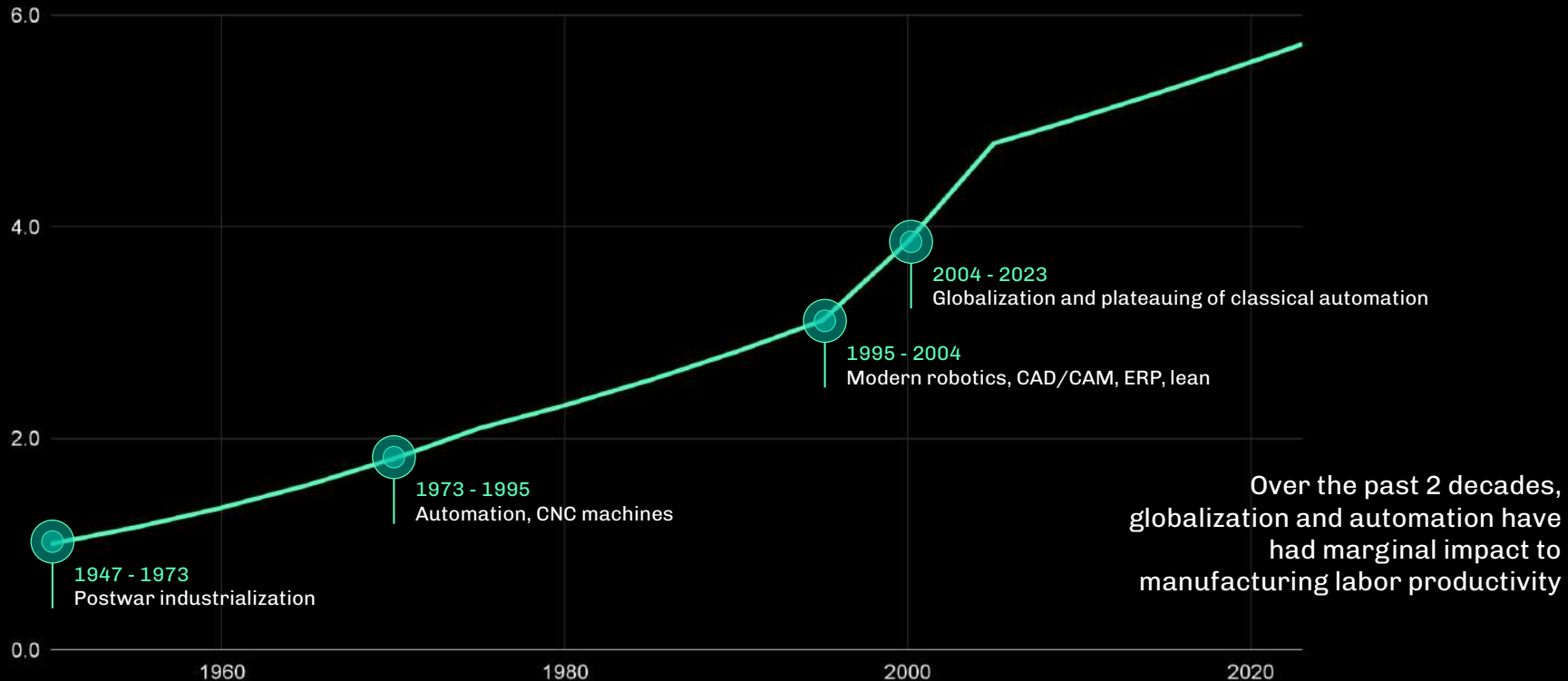
2025

**TECHNOLOGY IS ENABLING A NEW RENAISSANCE OF POLYMATHS**

**A SINGLE, MODERN ENGINEER IS ABLE TO ACCOMPLISH  
WHAT ONCE REQUIRED ENTIRE TEAMS**

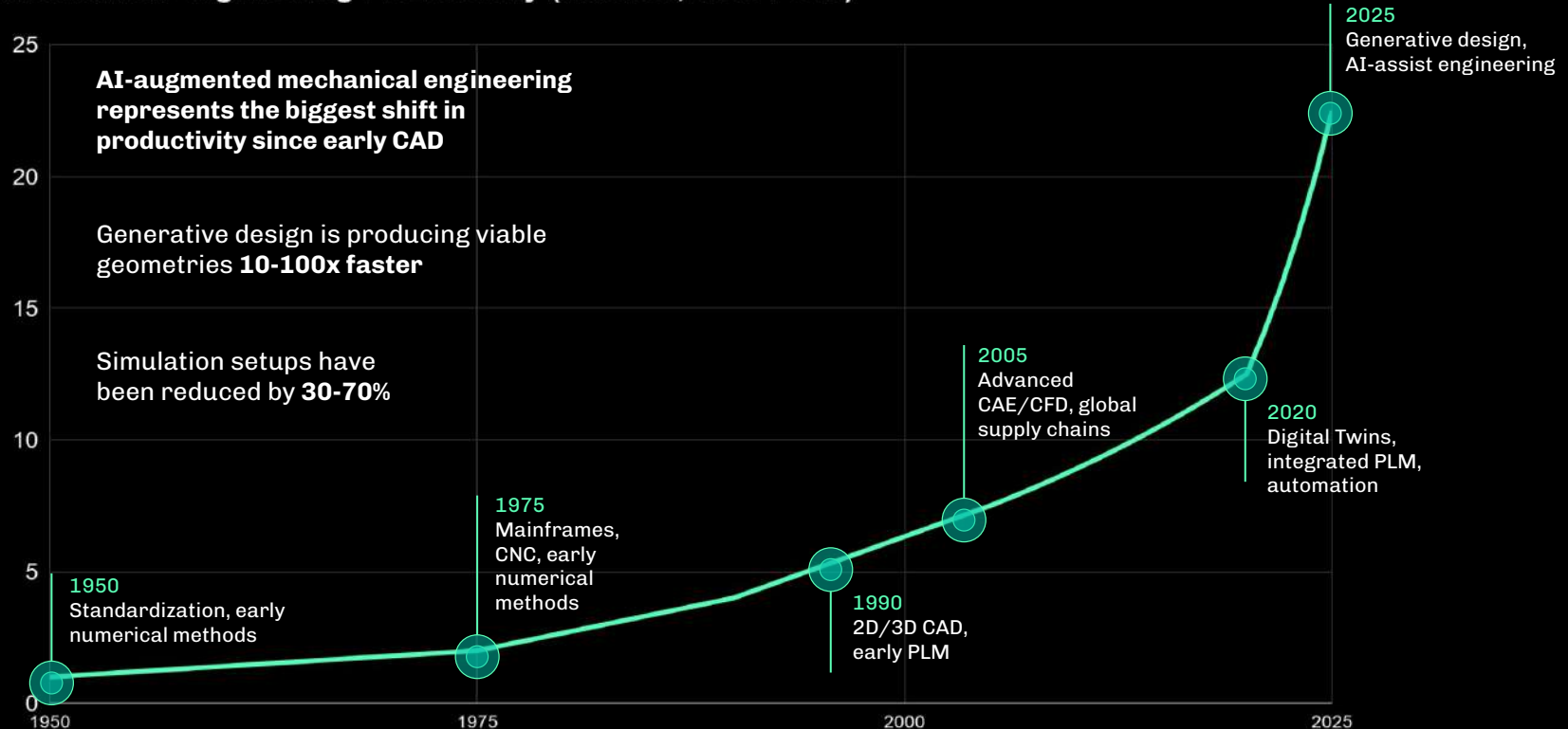
# THE MANUFACTURING-DRIVEN PRODUCTIVITY GAINS THAT DEFINED PRIOR WAVES OF INDUSTRIALIZATION PLATEAUED IN THE LATEST ERA OF CLASSICAL AUTOMATION

US Manufacturing Labor Productivity (Index, 1950-2023)



# PRODUCTIVITY GAINS HAVE SHIFTED UPSTREAM: ENGINEERING TOOLS HAVE EMERGED AS THE LARGEST DRIVER OF EFFICIENCY IMPROVEMENTS IN SPEED, COST, AND PRODUCT QUALITY

Mechanical Engineering Productivity (Indexed, 1950-2025)



Source: U.S. Bureau of Labor Statistics: Comparing 50 years of labor productivity in US and foreign manufacturing

# ACROSS INDUSTRIAL SECTORS, EVEN AS HW SYSTEMS BECOME MORE COMPLEX, MODERN ENGINEERING TOOLS HAVE ALLOWED FOR **FASTER DEVELOPMENT WITH FEWER RESOURCES**

## AUTOMOTIVE

Over the past 40 years, equivalent productivity per engineer has increased by 5-10x

Across GM Toyota, and Ford internal SOC reports show:

**50%** Reduction in development cycles

**85%** Reduction in number of physical prototypes

**60%** Reduction in validation time



TOYOTA



## INDUSTRIAL MACHINERY

Design and commissioning teams are **3-4x smaller** for comparable systems compared to 1970s

Across NASA, Siemens, and Autodesk, engineer are reporting **20-40% time savings** by automating repetitive HW tasks

SIEMENS NASA

AUTODESK

## AEROSPACE

Aerospace product complexity is estimated to have **grown by 100x** since the 1940s

Despite this, average development timelines have only increased **from ~2.5 years to ~6 years**

AI optimization has led to a **30-50% development** time decrease in the past 10 years

BOEING AIRBUS

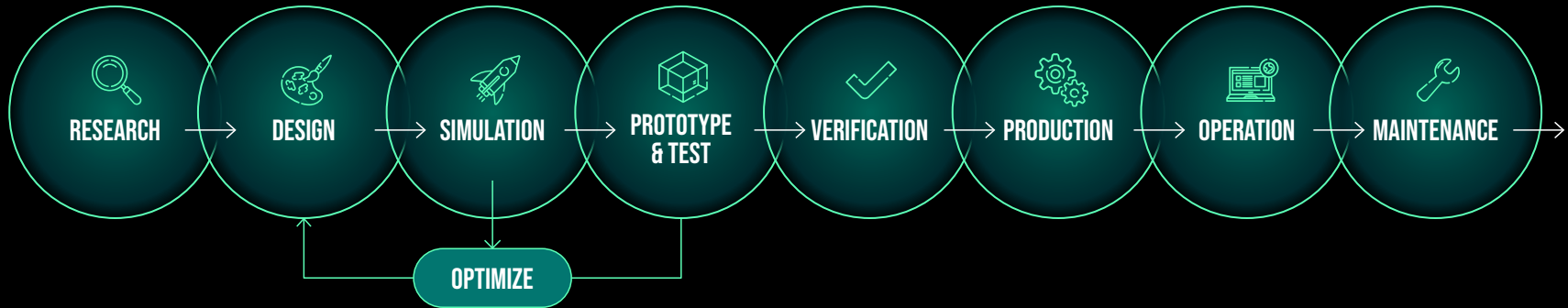
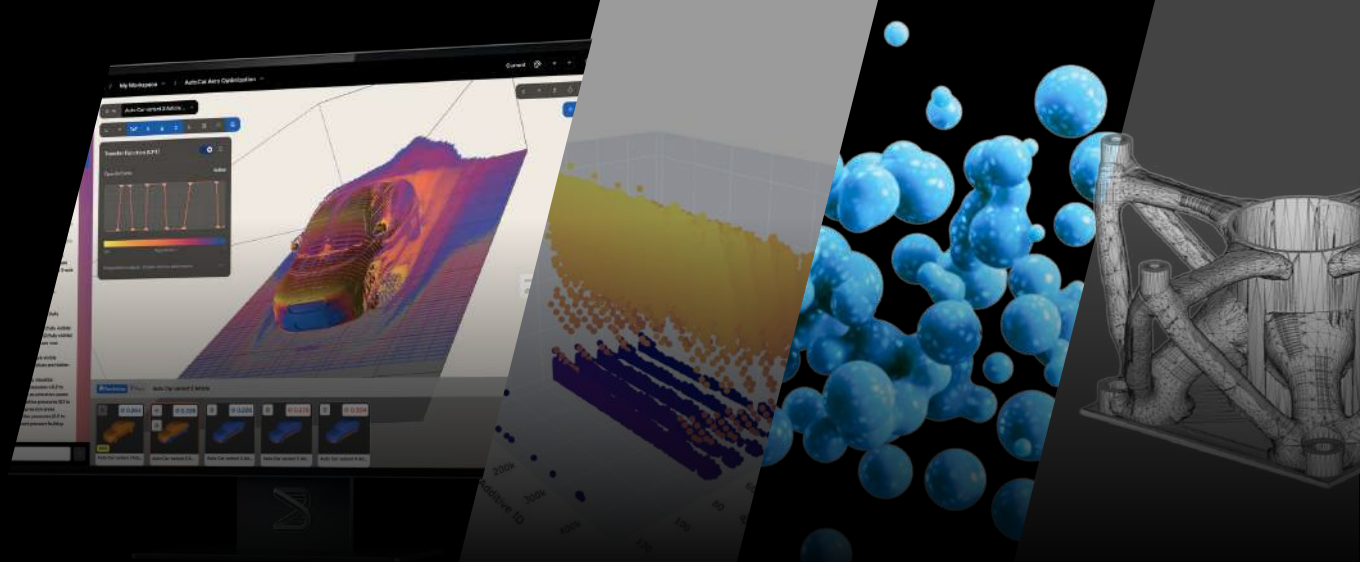
NORTHROP GRUMMAN

# NEXT “GEN” ENGINEERING

AI is disrupting every stage of the engineering workflow.

Physics-based foundation models and generative AI are

**FUNDAMENTALLY CHANGING THE ROLE OF THE ENGINEER**



# UP.PARTNERS SEES THE “SOFTWARE FOR HARDWARE” STARTUP LANDSCAPE DIVERGING INTO TWO DISTINCT VALUE CREATION MODELS

And one is much more interesting than the other.

## WAVE 1: Modernizing clunky 1990's era tools

ERP/MES



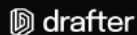
Requirements



Work Instructions



2D Drawings



PLM



Hardware-in-the-Loop



**UP.Partners investment thesis:** It's easy to sell into other startups, but difficult to overcome the bureaucratic inertia inside larger (more lucrative) incumbents who have legacy software deeply embedded. Wave 1 startups often plateau at \$2-10M ARR. Nominal is the outlier winner, unlocking new capability and supplanting Matlab (low switching costs).

## WAVE 2: AI that expands the realm of what's possible

Physics Foundation Models



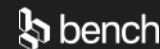
Material Discovery



Generative Design



End-to-End AI Orchestration




**UP.Partners investment thesis:** These models promise 10,000x efficiency gains or altogether novel capabilities. The value is so staggering that even sluggish incumbents (think: NASA, Cadillac, etc.) are racing to adopt them or **risk obsolescence**. Wave 2 winners will emerge as Deca-corn peers to Altair, Ansys, and Synopsys.

# AS AI COMPRESSES ENGINEERING CYCLES, MANUFACTURING BECOMES THE BOTTLENECK


OEMs face untenable 18+ month lead times on critical componentry, stymieing innovation. Startups are rushing to fill this demand. Speed — not price nor capability — is the new differentiator. “Your backlog is my opportunity.”

## WIRE HARNESSES

 Senra Systems

 Q5D

## COMPOSITES

 LAYUP

 ARRIS

 iCOMAT

## INVESTMENT CASTINGS

RANGEVIEW

## METAL PARTS

 SendCutSend

A E T H E R

## SURFACE FINISHING

 GRAY  
MATTER  
ROBOTICS

## NATURAL GAS TURBINES

STONE TECH®

 BOOM

## SATELLITE BUSES

APEX

## MICROTURBINE JETS

 Blisk Dynamics

 VOLUND  
MANUFACTURING

## NAVAL WELDING

 ABYSS DEFENSE

valstad

## SUBSYSTEM ASSEMBLY

[IBIS INDUSTRIES]

# HARDWARE WILL HAVE ITS CHATGPT MOMENT, AND IT WILL RESHAPE THE REAL WORLD

REAL-WORLD  
DATA

PHYSICS FOUNDATIONAL  
MODELS

COMPUTE AND  
MANUFACTURING

**BREAKTHROUGH**

IMPACT IN THE  
PHYSICAL WORLD



## RADICAL EFFICIENCY GAINS

The Design/Simulate/Test workflow shrinks from months to minutes. The incremental cost of pursuing perfection becomes ~zero.



## SHIPPING HW AT THE SPEED OF SW

HW design copilots and flexible manufacturing compress design cycles. Engineers can iterate HW overnight.

## “CHATGPT MOMENT” FOR HARDWARE

## THE SOLO-FOUNDER UNICORN

A single dedicated engineer, armed with next-era tools, can take an idea from concept to closing bell.



## A CLEANER, MORE RESILIENT WORLD

Less drag. Stronger structures. More heat efficient chips. Safer. Less waste. Longer lifetimes. Less carbon. Affordable for all.



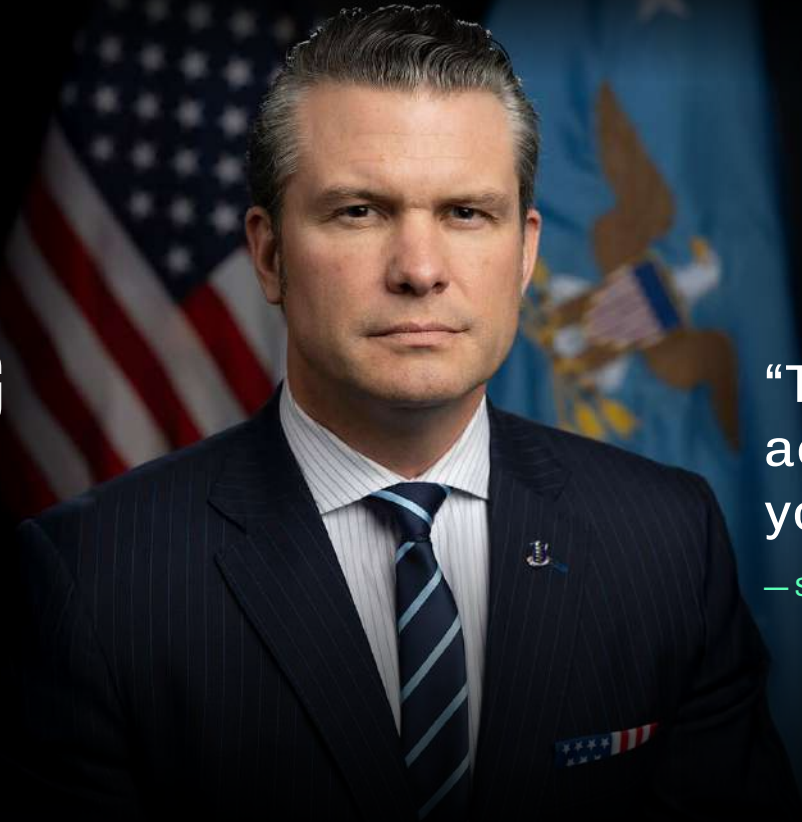
## REVIVING AMERICA'S GLOBAL COMPETITIVENESS

The only way for America to reclaim its industrial edge is to leverage innovation. Intelligent orchestration of engineering tools is America's answer to China's scale and industrial policy.

**HIGH-STAKES ENVIRONMENTS DRIVE INNOVATION.  
DEFENSE WILL BE THE FIRST PROVING GROUND  
FOR AI-NATIVE HARDWARE.**



# WARFIGHTING ACQUISITION REFORM



“The defense acquisition system as you know it is dead.”

— Secretary of War Pete Hegseth

# DEFENSE IS REWRITING THE INCENTIVE STACK FOR HARD TECH

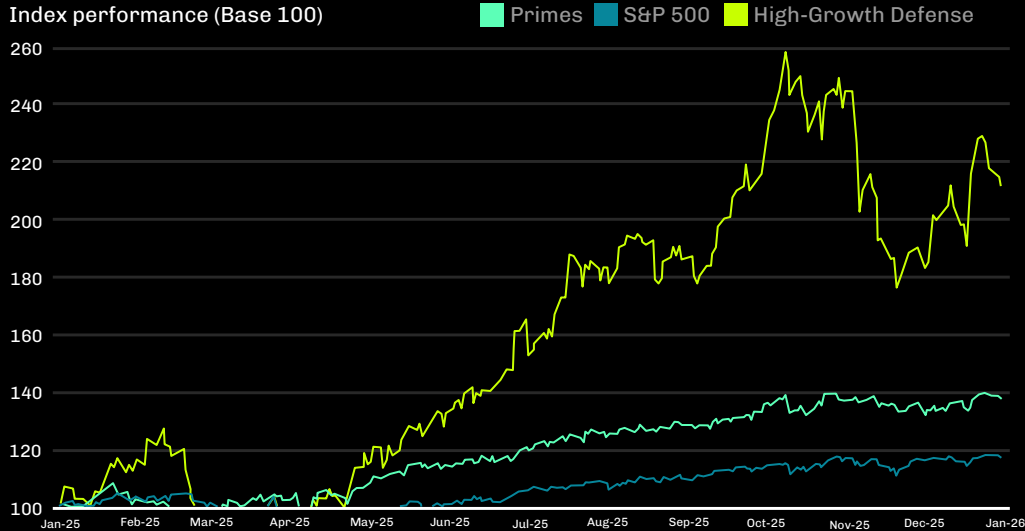
**Security is the forcing function fueling a second industrial revolution**

Supply chains, comms, cyber, minerals, autonomy, infrastructure

**DoW isn't just a customer, it's a market maker**

Requirements → Contracts → Standards → Urgency

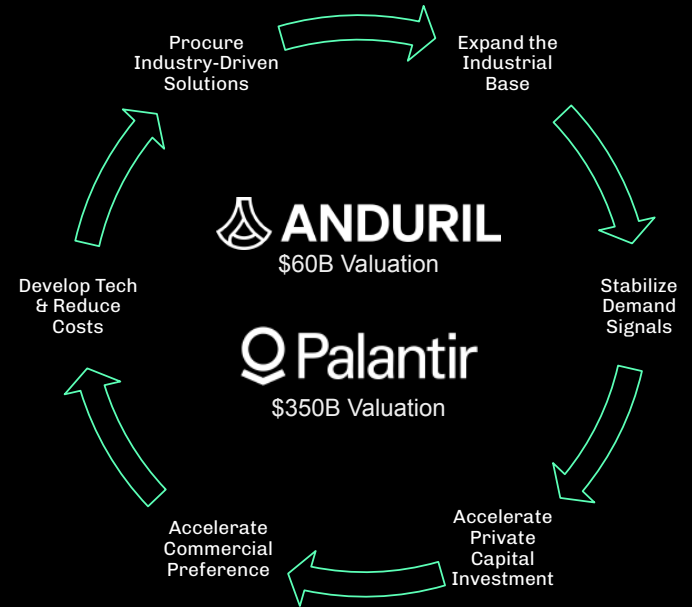
## High Growth Defense Sector Outperforms S&P 500 And Primes



Note: Primes cohort includes BA, RTX, LMT, NOC, GD, LHX, HWM, LDOS, CACI; High-Growth Defense cohort includes: PLTR, AXON, AVAV, KTOS, RKLK, VOYG

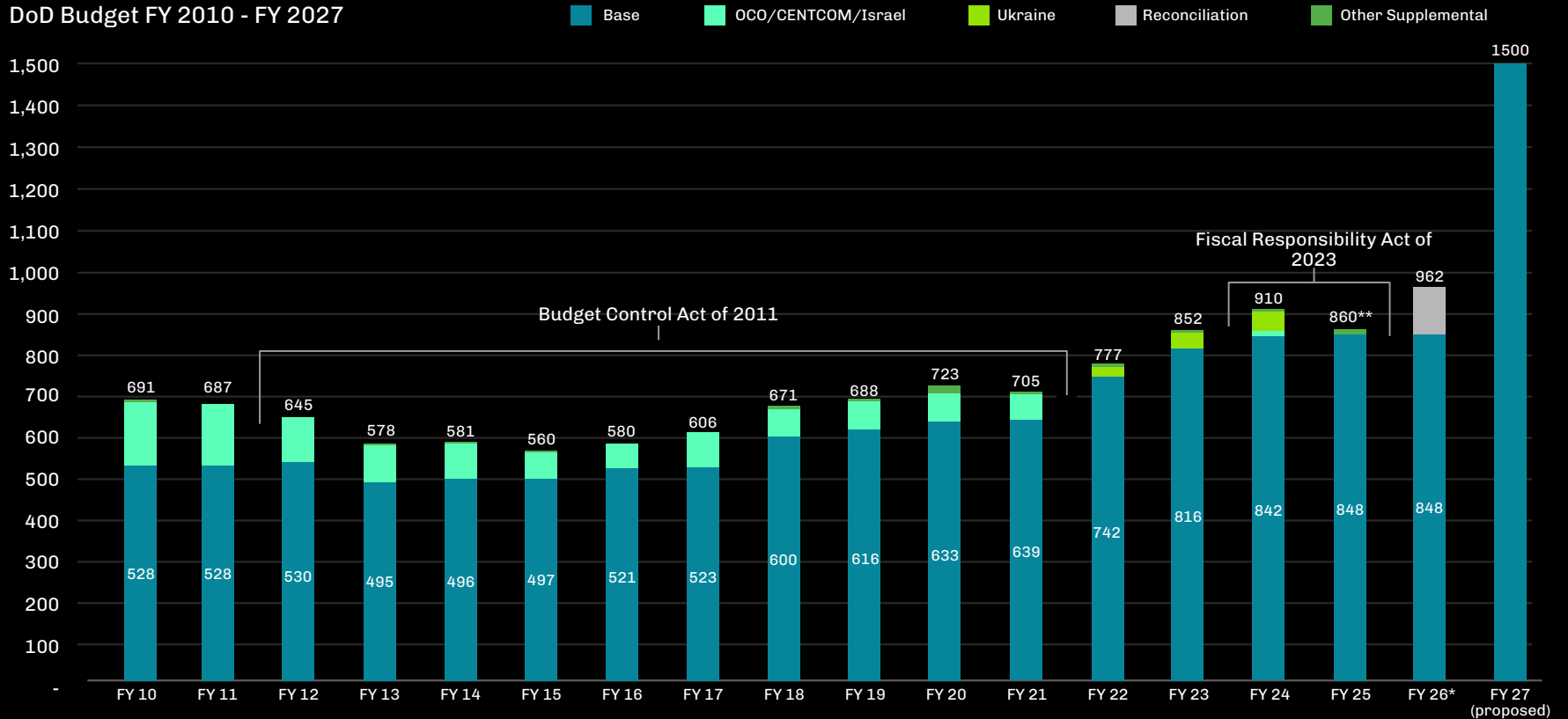
Source: Bessemer Venture Partners, 2026 Defense Tech Roadmap

## REBUILDING THE DEFENSE INDUSTRIAL BASE FLYWHEEL



# \$1.5T PROPOSED DoW FY27 BUDGET IS A MESSAGE TO INDUSTRY: SCALE WINS

DoD Budget FY 2010 - FY 2027



\*Discretionary Budget Authority with Mandatory Reconciliation Funding in FY 2026; \*\* FY 2025 Enacted

Source: US DoD Fiscal Year 2026 Budget Request

# THE MENTALITY SHIFT: “85% NOW BEATS 100% NEVER”

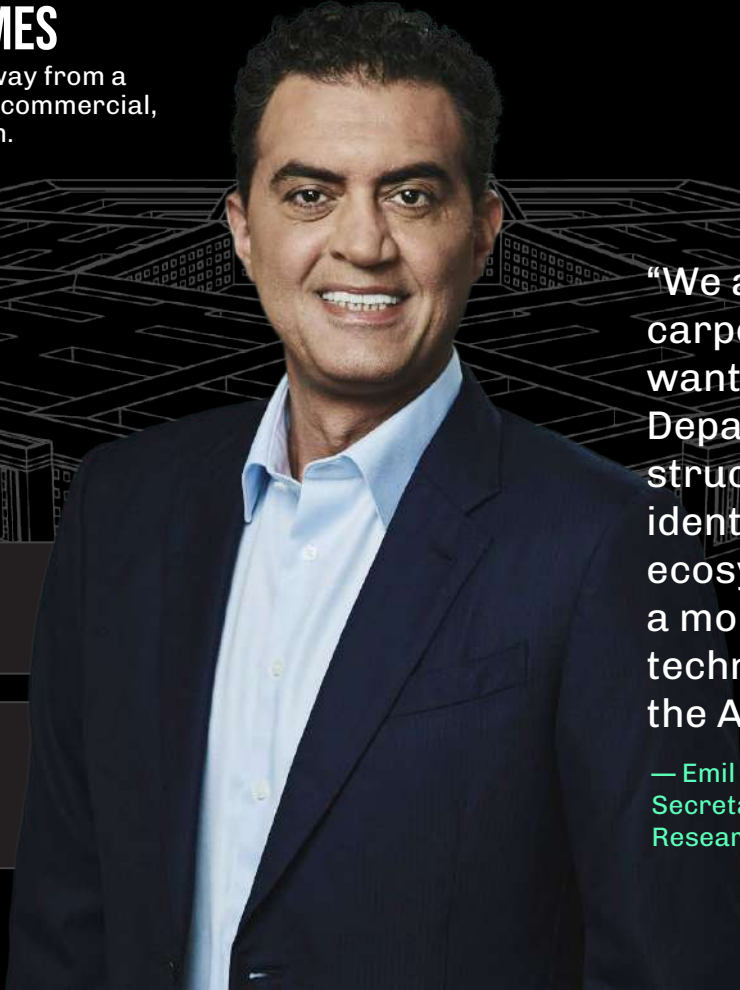
— Secretary of War Pete Hegseth

The DoW is explicitly trading perfection for speed and scale, quantity over quality.



# PIVOT AWAY FROM THE PRIMES

The Pentagon is intentionally shifting away from a prime-dominated model toward a more commercial, venture-backed, fast-moving ecosystem.



“We are rolling out the red carpet for innovators who want to work with the War Department. This new structure creates a stronger identity for our innovation ecosystem and gives industry a more direct path to move technology into the hands of the American warfighter.”

— Emil Michael, Under Secretary of War for Research and Engineering

Default to commercial-first where possible.

Deep emphasis on rapid contracting mechanisms and scaling proven technology.

# PIVOT AWAY FROM THE PRIMES: DoW DRONE DOMINANCE PROGRAM

The Department of War announced a \$1.1B Drone Dominance Program (DDP) competition designed to “rapidly field domestically manufactured low-cost, one way attack drones.”

RELEASE

War Department Announces  
Vendors Invited to Compete in  
Phase I of the Drone  
Dominance Program

Feb. 3, 2026



Not a single Defense Prime was selected, highlighting DoW commitment to diversify and expand the industrial base.

## Companies selected:

Anno AI

ASCENT  
AEROSYSTEMS

Auterion

DZYNE

EWING  
AEROSPACE

Farage  
Precision

FIRESTORM

GENERAL  
CHERRY

GREENSIGHT

GRIFFON  
AEROSPACE

Halo  
Aeronautics

KRATOS  
DEFENSE & SECURITY SOLUTIONS

MODAL  
AEROSYSTEMS

Napatree  
Technology

NEROS

NOKTURNAL AI

PALADIN

PDW

Responsibly  
LTD

SWARM  
DEFENSE

TEAL

DEFENSE TECH FOR  
UKRAINE

VECTOR

Darley

XTEND

# ACQUISITION REFORM IN ACTION: 72 HOURS FROM BID TO AWARD

In March 2026, the U.S. Army awarded a \$52M contract for 2,500 Skydio drones. **The complete acquisition cycle took just 3 days**, proving that procurement can now move at the speed of conflict.



Skydio is a Series F startup delivering capabilities that, just years ago, would've sold for \$1M/system. Today, they're mass manufactured in California at 100x lower cost.



GPS-denied autonomy



Advanced optical zoom



Thermal imaging

# UKRAINE/RUSSIA HAS FUNDAMENTALLY CHANGED WARFARE

Scaled employment of COTS systems has unlocked a new level of flexibility and regeneration in warfare. **Tactics are developing daily, not yearly.** "Technological Superiority" is a fast-moving target.

## Russia Increasingly Relies on One-Way Attack Drones to Sustain Its Attack on Ukraine

Monthly missiles and drones launched by type, September 28, 2022 to December 28, 2024

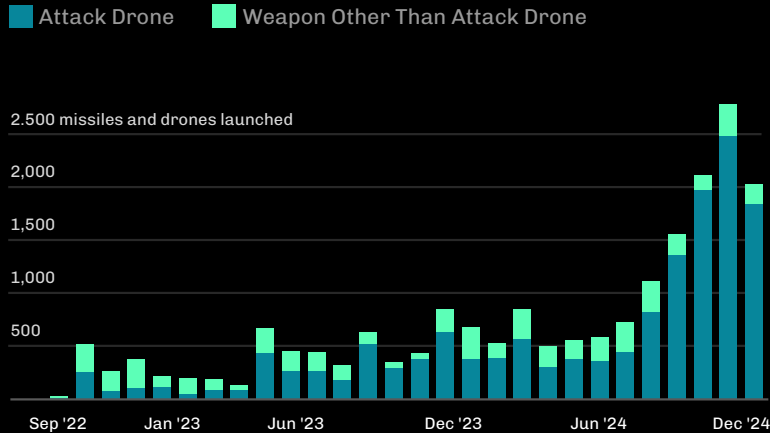
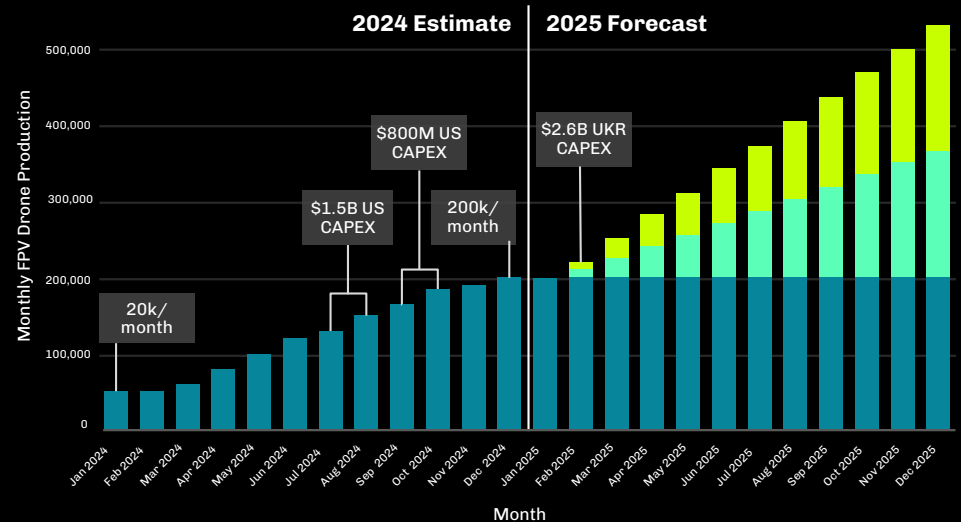


Chart: CSIS Futures Lab. Source: Author's analysis of Ukrainian Air Force data compiled by Petro Ivaniuk.

## Ukrainian FPV Drone Production

Legend: Base Production (Blue), Increment 1 (Green), Increment 2 (Yellow)



Source: War Quants

A swarm of four white, V-shaped drones flying against a sunset sky. The drones are arranged in a loose formation, with one in the upper left, one in the upper right, one in the lower left, and one in the lower right. The sky is a mix of orange, yellow, and blue, with some clouds. The text is overlaid on the left side of the image.

# THE FUTURE IS CLEAR: SIMULTANEOUS MASS DRONE SWARMS ARE HERE

How do we stop them?

What are the “picks and shovels” that enable them?

# DOZENS OF INCUMBENTS AND STARTUPS ARE DEVELOPING A ROBUST COUNTER-UAS SOLUTION SPACE

Each technology has distinct relative advantages; an effective defense will require a layered multi-solution architecture.



LASER

KINETIC



HIGH-POWERED MICROWAVE

JAMMING + SPOOFING

# COUNTER UAS PICKS AND SHOVELS: POWER + COMPUTE + COMMS AT THE EDGE

Autonomous drones are the new munitions:

- Power is ammo
- Communication is armor
- Throughput is stealth

The real leverage isn't in the drones themselves. **It's in the enabling tech stack.**

## COUNTER-UAS MISSION TECHNOLOGY STACK

Power

Batteries, Generators, Charging, Thermal Management

Compute

Edge GPUs/ASICs, Onboard AI

Comms / PNT

Anti-jamming, Mesh Networking, GPS-Denied Autonomy

Packaging

Ruggedization, Modularity, Test Automation

**UP.Partners investment thesis:** The venture-scale winner in this UAS transition may not be any singular point-solution, but rather the infrastructure company that enables mass deployment and sustained operations across all defense vectors.

# RE-EMERGENCE OF THE MARITIME DOMAIN



**71%**

of the earth's  
surface is covered  
by water

**~80%**

of the volume of  
international trade  
in goods is carried  
by sea

**The global economy rides  
on sea lanes**

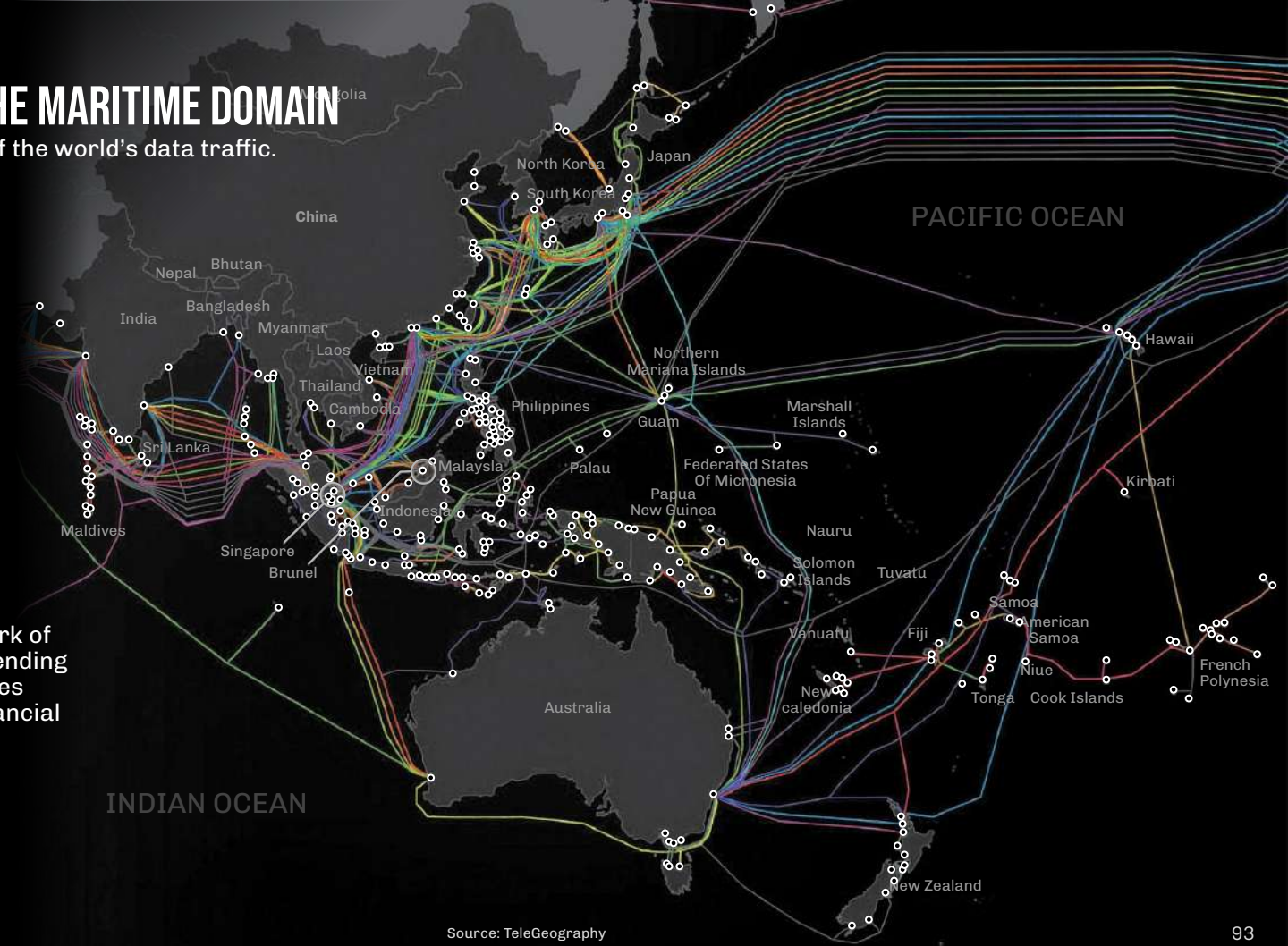
# RE-EMERGENCE OF THE MARITIME DOMAIN

Submarine cables carry 95% of the world's data traffic.

## THE DIGITAL ECONOMY RIDES ON THE SEABED

An undersea fiber optic network of nearly 600 cable systems, extending 1.4 million kilometers, facilitates \$10T+ in daily internet and financial throughput

○ = CABLE LANDING SITE



# WHITE HOUSE RELEASES AMERICA'S MARITIME ACTION PLAN

A clear vision for the resurgence of the Maritime Industrial Base.

## National Security Infrastructure

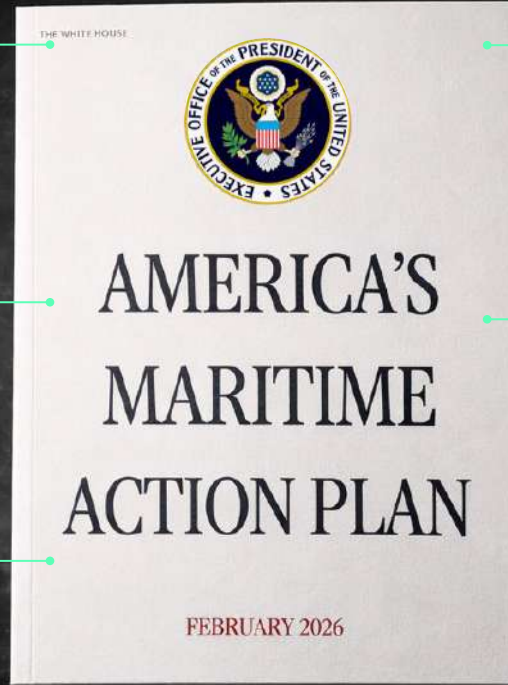
Maritime power recentered as the backbone of military logistics, sealift capacity, and wartime economic sustainment

## Supply Chain Sovereignty

Less than 1% of global commercial ships built domestically makes shipbuilding a strategic vulnerability requiring industrial rebuilding

## Industrial Mobilization Doctrine

A whole-of-government push: multiyear procurement, shipyard modernization, and capital incentives aimed at rebuilding the Maritime Industrial Base at scale



## Geographic Expansion of Competition

Emerging sea routes are reopening maritime geography as a central arena of economic and military competition

## Robotics & Distributed Production

Autonomous surface and subsurface systems enable modular, distributed shipbuilding and scalable, attritable maritime force structure

# THE PACING THREAT IS STRATEGIC COMPETITION WITH CHINA: THE INDO-PACIFIC THEATER IS SHAPING MARITIME EVOLUTION

Overcoming the tyranny of distance requires a network of sensors spanning every domain to maintain persistent maritime domain awareness.



SAR



Signals Intelligence



PNT

SPACE



AWACS



UAVs andUCAVs



Airborne Early Warning



Helicopters

AIR



Over-the-Horizon Radars



Long Range Radars



SIGINT Sites



Mobile Radars

LAND



Naval and Coast Guard Ships



Specialized Tracking Ships



Civil Ships



Over Ground Intelligence and Special Forces

SEA SURFACE



Ship-based and Air-based Sonar



UUVs



Underwater Sensors

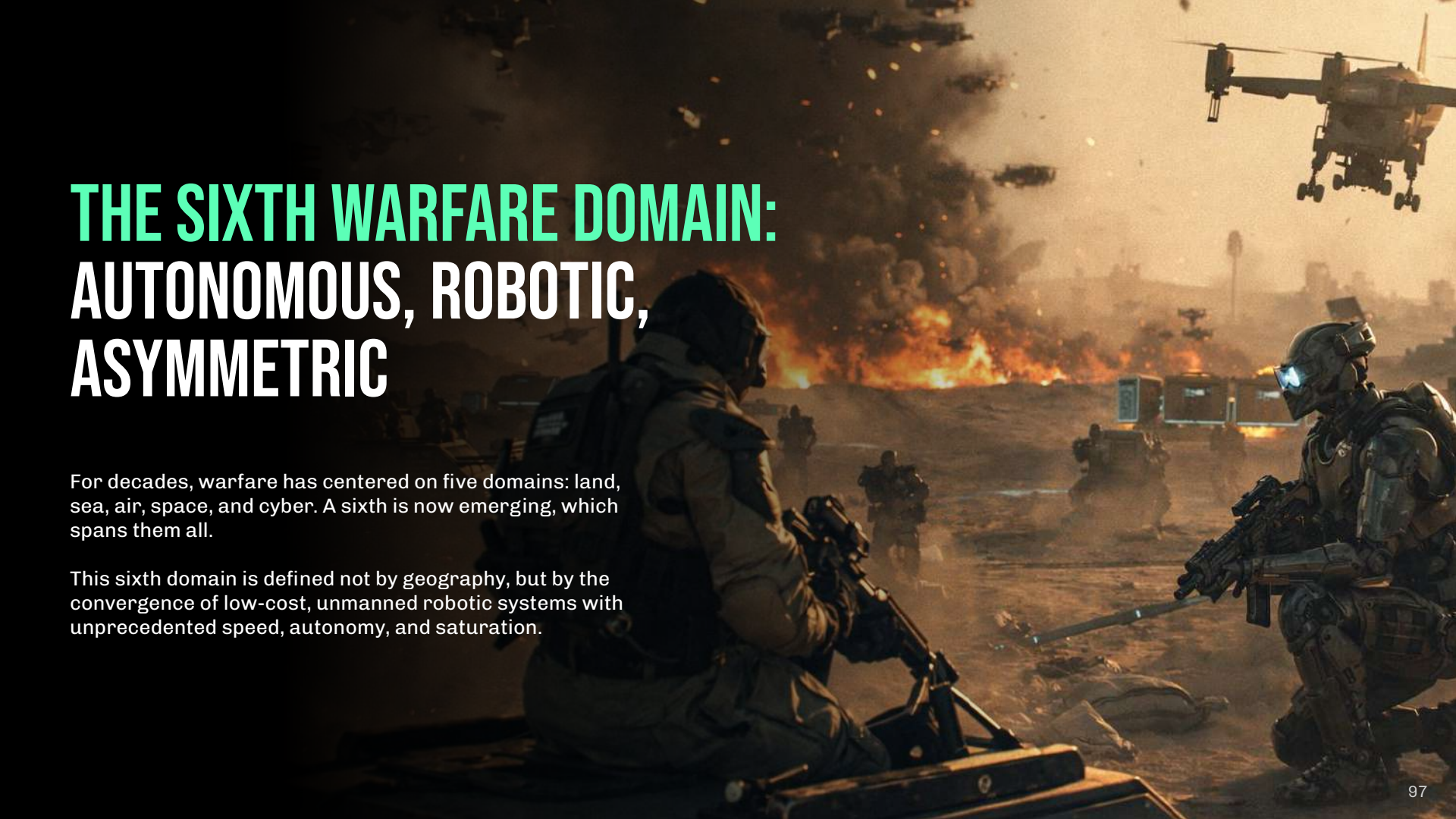
SUB-SURFACE

# MARITIME AUTONOMY AT SCALE UNLOCKS NAVAL DOMINANCE

INDOPACOM introduces an inflection point in how maritime autonomy is positioned for operational sea denial, covert assured access, and distributed effects.

Physics, clutter, and attribution complexity tilt the advantage toward the defender in crowded littorals and narrow chokepoints.



A dramatic, high-contrast scene of a futuristic battlefield. In the foreground, a soldier in a dark, tactical uniform is seen from the side, looking towards the right. To his right, a highly advanced, metallic robot with glowing blue lights on its helmet and joints is crouching, holding a futuristic rifle. The background is a chaotic urban environment with a large fire burning in the distance, billowing smoke, and several military drones flying in the sky. The overall atmosphere is one of intense, high-tech warfare.

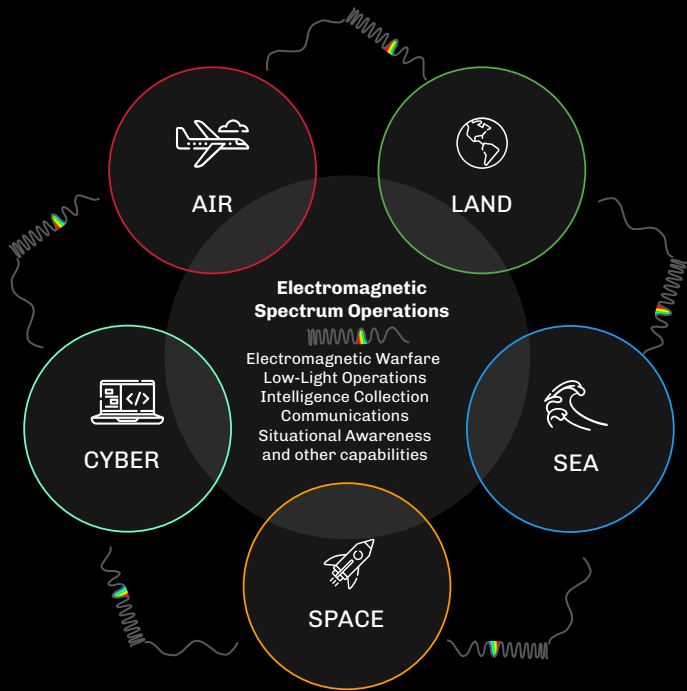
# THE SIXTH WARFARE DOMAIN: AUTONOMOUS, ROBOTIC, ASYMMETRIC

For decades, warfare has centered on five domains: land, sea, air, space, and cyber. A sixth is now emerging, which spans them all.

This sixth domain is defined not by geography, but by the convergence of low-cost, unmanned robotic systems with unprecedented speed, autonomy, and saturation.

# RF SPECTRUM DEFINES THE 6TH DOMAIN: WHEN RF FAILS, THE KILL CHAIN FAILS

- **Congested and contested:** Commercial density + deliberate electromagnetic warfare create constant friction.
- **GPS denial is mainstream:** Maritime & aviation disruptions show routine navigation warfare.
- **Electronic warfare is a rapid-cycle arms race:** Adaptation happens at battlefield tempo.



The joint force depends on the electromagnetic spectrum for operations in all domains



Software-only spectrum intelligence. Real-time RF map that can pinpoint jamming within 50-200m

\$13M Seed, Feb '26



Drones which detect, geolocate, and eliminate hostile RF threats

\$31M A, May '25



Full-stack RF resilience platform spanning comms, radar, and anti-EW hardware

\$24M A, Dec '25

# UNDERSECRETARY OF WAR MICHAELS HAS ORDERS TO BUILD "5 NEW PRIMES"

## WINNERS

### DATA



### AUTONOMY



### SPACE



## CONTENDERS

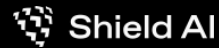
### LAND



### MARITIME



### AIR



### ORCHESTRATION

Contested logistics



C5



### INDUSTRIALS

HADRIAN™



5 NEW PRIMES

**THE COMPLEX SYSTEMS RESHAPING  
DEFENSE AND AI-NATIVE HARDWARE ALL  
DEPEND ON THE SAME UNDERLYING  
CONSTRAINT: ELECTRONS.**

The background of the slide is a server room. In the foreground, several thick black cables are bundled together and curve across the frame. In the background, server racks are visible with various lights, including bright blue LEDs and warm yellow/orange lights, creating a bokeh effect. The overall atmosphere is high-tech and futuristic.

THE  
**KINETIC**  
**AGE**  
2026

# ENERGY AS THE AI BOTTLENECK

# THE U.S. HASN'T SPENT THIS KIND OF MONEY SINCE LANDING A MAN ON THE MOON. WITHOUT DOUBT, AI IS THE NEW FRONTIER

## MORE THAN:

- The U.S. interstate highway system (\$630B)
- The Apollo Moon program (\$257B)
- The International Space Station (\$150B)
- Walmart's revenue last year (\$648B)

*Inflation-Adjusted*

## EQUIVALENT TO:

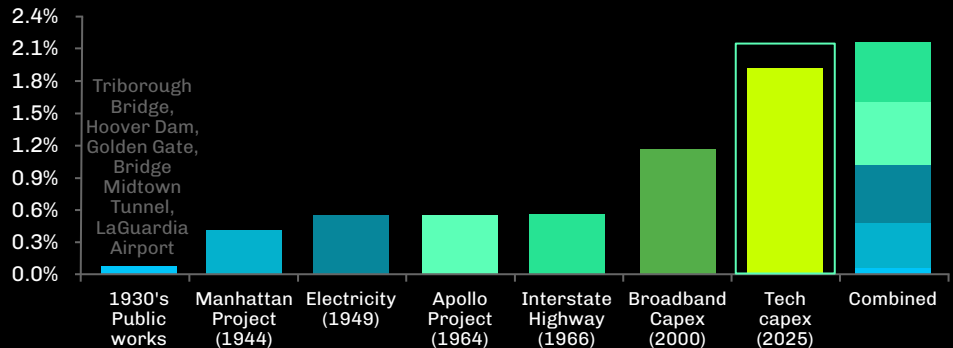
- ~25% of ALL military spending globally
- Buying 50 Gerald R. Ford class aircraft carriers
- Spending \$1.8B every day
- Spending \$1.2M every minute

U.S. tech invested \$670B into AI in 2025

## THE BIGGEST PROJECT IN THE HISTORY OF CAPITALISM

And we are spending all of it...  
in one year

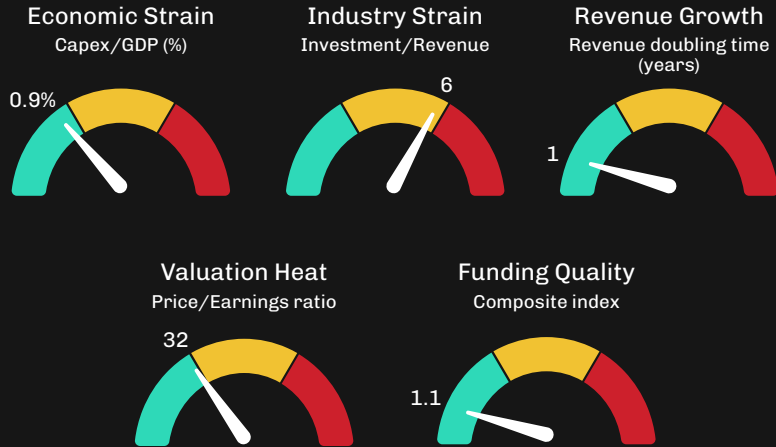
Tech capital spending in 2025 vs. spending on major U.S. infrastructure projects  
Peak annual project percent of GDP



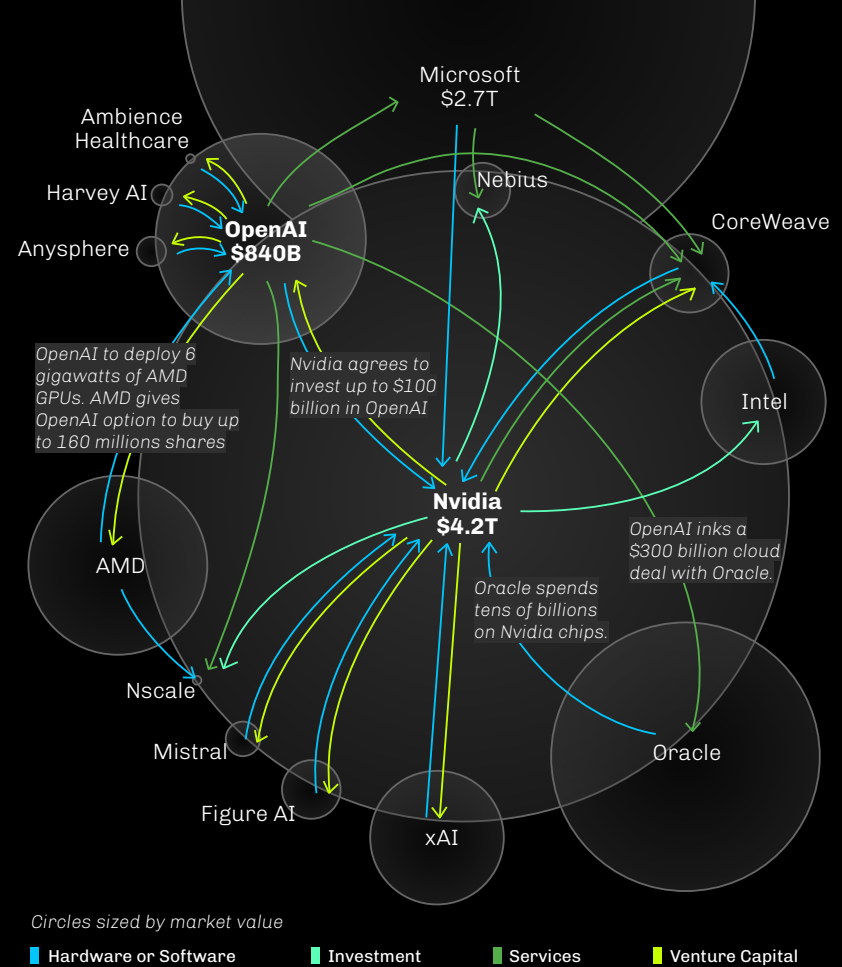
# THE ENGINE IS WHINING, BUT NOT OVERHEATING

AI is not immune to market dynamics, but **current economics are relatively healthy** compared to conditions surrounding historical bubbles.

AI Boom or Bubble?  
Two reds = trouble



Source: Exponential View, boomorbubble.ai (September 2025)



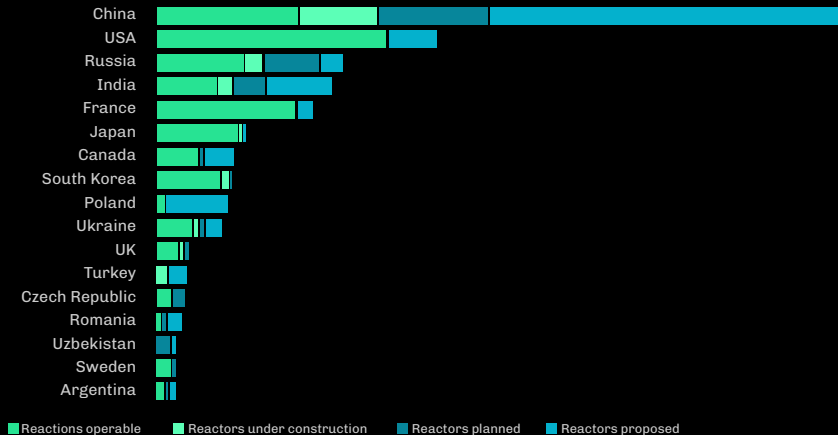
Source: Bloomberg, "OpenAI, Nvidia Fuel \$1T AI Market with Web of Circular Deals" (October 2025)



# NUCLEAR IS BACK IN THE MIX

- May 2025** Red tape gets slashed on new U.S. reactors
- July 2025** U.S. DOE launches pilot program for nuclear reactors
- Nov 2025** \$1B loan to restart PA nuclear power plant
- Dec 2025** \$800M from DOE for small reactors
- Jan 2026** \$2.7B investment to expand U.S. uranium capacity

Number of reactors proposed, planned and being built across the globe, July 2025



Source: World Nuclear Association, World Economic Forum

## Investors commit billions into fission, fusion, and Small Modular Reactors



Vistra, TerraPower, and Oklo are partnering with Meta to deliver >6 GW of nuclear power to AI data centers by 2035

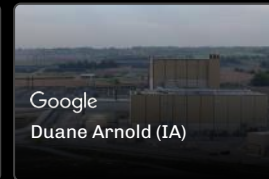
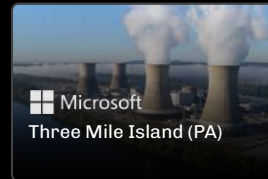


Pacific Fusion\* raised \$900M Series A to develop pulsed magnetic fusion



Radiant raised \$300M to deploy portable SMRs for military operations

## Hyperscalers race to secure baseload nuclear power



\* UP.Partners Portfolio Company

# THIS IS WHAT AN 'ALL OF THE ABOVE' ENERGY STRATEGY LOOKS LIKE

## GEOTHERMAL



Fervo Energy applies fracking processes to geothermal resources



Zanskar\* uses AI to discover overlooked geothermal resources

## HYDROGEN

### VERNE



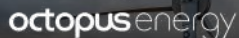
Verne and Electric Hydrogen convert clean energy into portable, storable, hydrogen fuel

## CLEAN NATURAL GAS

### Terraform Industries

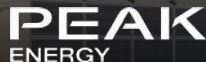
Terraform Industries produces synthetic natural gas from electricity and air

## GRID OPTIMIZATION SOFTWARE



Octopus Energy's software brings clean, distributed energy to the masses

## GRID SCALE STORAGE



Peak Energy's low-cost sodium ion battery is growing to giga-scale

## INDUSTRIAL HEAT



Karman deploys high-efficiency electric heat pumps into data centers & industrials

## GRID MAINTENANCE



Buzz empowers utilities to inspect, analyze, and repair infrastructure at scale



Stealth Startup

A digital replica of the electricity grid that unlocks hidden value for utilities\*



Rondo's batteries store heat in bricks

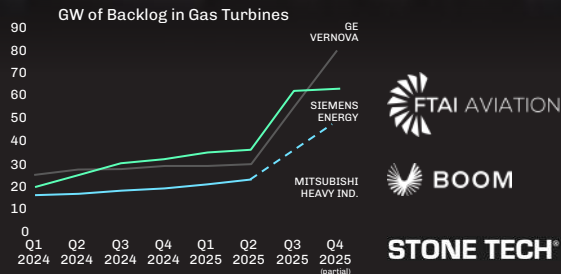
## INTERCONNECTION



Pearl Street Technologies' software is tackling the interconnection queue head-on

# TRADITIONAL TECH ISN'T ENOUGH; TRAILBLAZERS ARE BREAKING THE MOLD TO MEET SURGING DEMAND

## AIRCRAFT ENGINES REPURPOSED TO POWER AI



Boom is converting their supersonic engine into gas turbines, while FTAI is repurposing retiring CFM56 engines and Stone Technologies is racing to deliver clean-slate gas turbines

## DATA CENTERS IN SPACE



"In the long term, space-based AI is obviously the only way to scale."

— Elon Musk

ODYSSEY

Sophia

## DATA CENTERS ON WHEELS

Skygrid

Skygrid connects the GPUs inside idle EVs into "decentralized data centers"

## DATA CENTERS OFF THE GRID

RUNE

Rune uses surplus power at solar and wind farms to perform computational workloads

## BIG TECH VERTICALIZES ENERGY

Alphabet to buy clean energy developer Intersect in \$4.75 billion deal amid AI push



Alphabet is building an internal energy development arm

Reuters

## NOVEL CHIP ARCHITECTURES

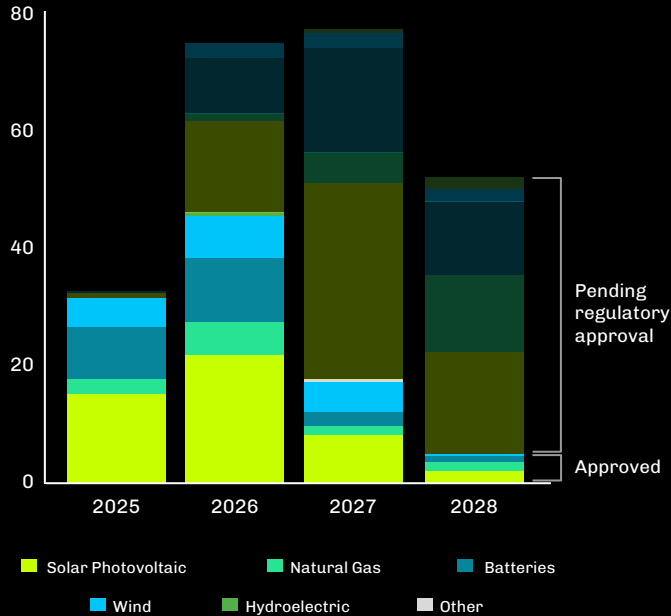
EXTROPIC

Pioneer in thermodynamic compute, 10,000x more energy efficient than a GPU

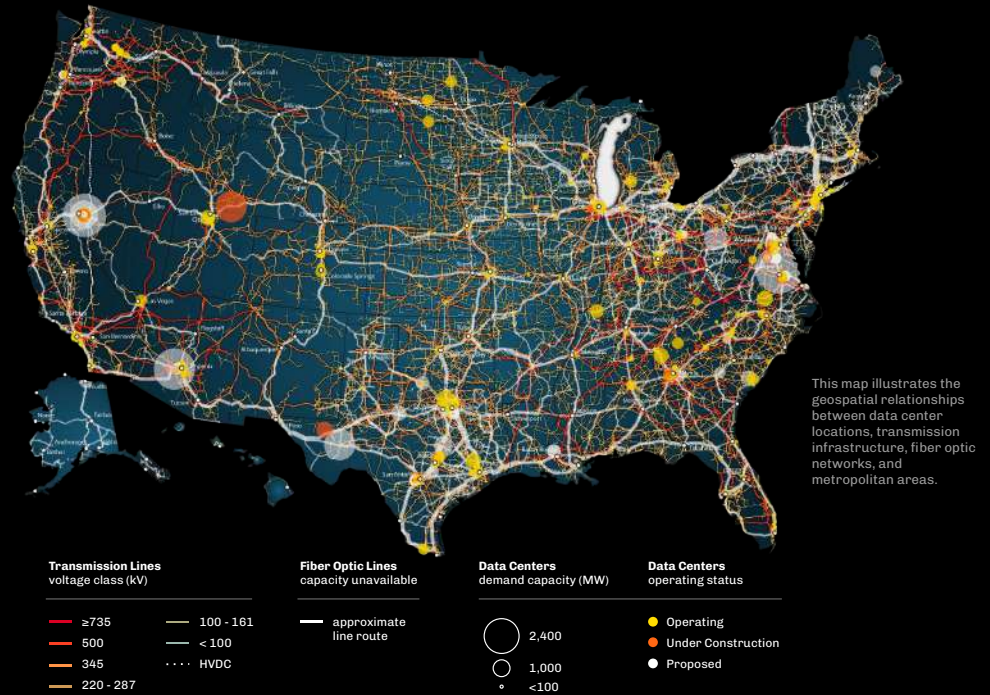
# THE GRID IS BURSTING. WILL EXISTING INFRASTRUCTURE SUPPORT THE SURGING TRAFFIC?

China can build a power plant in less than 2 years; in the U.S. it can take up to a decade. In PJM alone, hundreds of gigawatts (enough to power 60 million homes) are stuck in the interconnection queue. At the same time, aging powerlines, substations, and control systems are increasingly prone to failure.

Planned US capacity (GW)



Data Center Infrastructure in the United States, 2025



# STARTUPS ARE ANSWERING THE CALL TO MODERNIZE AND HARDEN THE GRID

Hyperscalers have enlisted emerging resiliency tech across transmission, storage, and asset inspection.

## TRANSMISSION



LineVision ensures grid reliability through real-time virtual monitoring

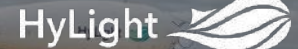
## STORAGE

Backed by Google



Repurposes EV batteries for behind-the-meter storage

## ASSET INSPECTION



Autonomous blimps inspect energy infrastructure

Backed by Microsoft



Superconductor power lines which maximize capacity and minimize loss

Backed by Sam Altman



Modular battery systems deliver dispatchable renewable energy



Drones inspect and perform maintenance on wind turbines

Backed by Nvidia



Solid-state transformers and advanced electronics to modernize the grid

\$1B Series C in 2025



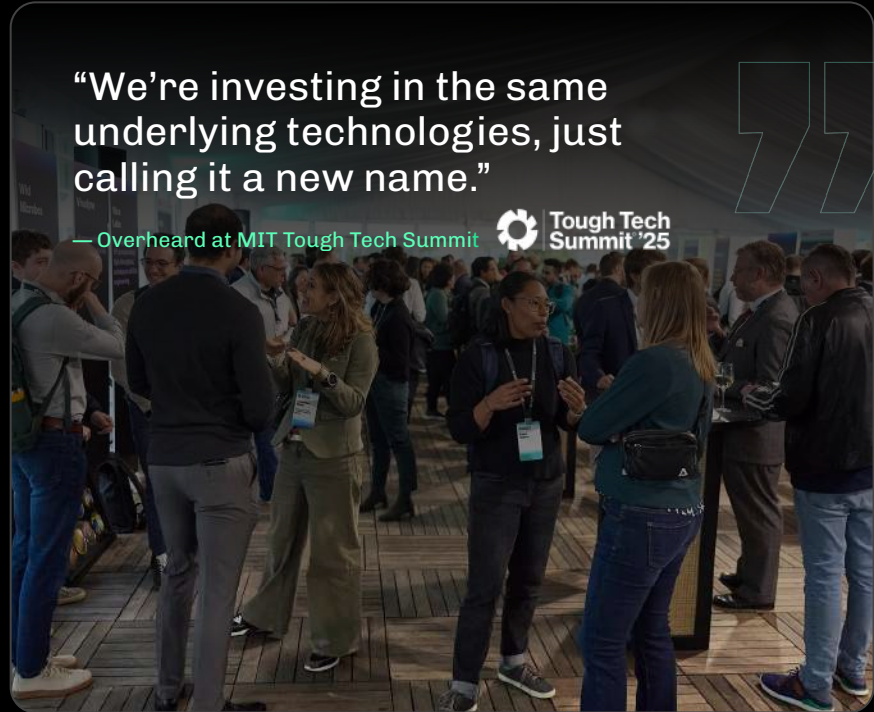
Delivers ~free residential battery storage to Texas homeowners

Backed by U.S. DoW



Robots that climb, crawl, swim, and fly to inspect critical infrastructure

# “GREEN” IS SO 2024. “ENERGY SECURITY” IS THE REBRAND



# AI DATA CENTERS HAVE BEEN GETTING A BAD RAP; IT'S TIME TO DEBUNK SOME RUMORS

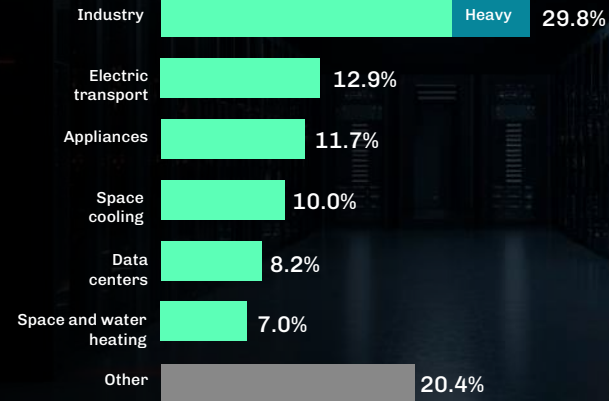
Yes, data centers are water-intensive, with  $\frac{2}{3}$  built in already water-stressed areas. But **modern closed-loop cooling systems continuously recirculate water after a one-time fill**. This cuts consumption by  $>75\%$ , down to similar levels as an office building.

## 17 BILLION GALLONS OF WATER:



It's true that electricity prices are on the rise, but data centers aren't the primary culprit. **Industry and transportation are the two largest drivers of rising demand**, exacerbated by the rising cost of grid infrastructure itself.

## Share of increase in global electricity demand by sector, 2024-30



**Reassigning blame: golf courses, ground beef, and growing industry are worse offenders.**

# USING THESE NEW TOOLS FOR GOOD: PUTTING THE AI IN SUSTAINABILITY



# STARTUPS ARE RISING TO MEET INTENSIFYING CLIMATE CHALLENGES, AND GOVERNMENTS ARE FOOTING THE BILL

The world is witnessing more droughts, dirtier air, fiercer fires, and worsening floods.



WATER

**RAINMAKER**

Rainmaker's drones seed clouds and induce precipitation to eliminate drought



AIR

**AIRCO**

Air Company captures carbon from the air and converts it into jet fuel



EARTH

**TERRANOVA**

TerraNova mitigates flood risk by robotically elevating acres of terrain



FIRE

**BURNBOT**

BurnBot reduces wildfire risk by systematically reducing fuel load with prescribed fires

**A NEW GENRE OF GEOENGINEERING TECHNOLOGIES IS EMERGING TO INCREASE RESILIENCE AGAINST THE MOUNTING EXTREMES OF CLIMATE CHANGE**

# AFTER ENERGY IS SOLVED, ADVANCED MATERIALS WILL BE THE NEXT BOTTLENECK

After labor is automated and energy is “too cheap to meter,” the true constraint becomes fundamental science.

Unlimited electricity is the key to unlocking advanced materials science: Synthetic production of critical materials like concrete, steel, titanium, carbon fiber and more

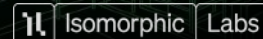
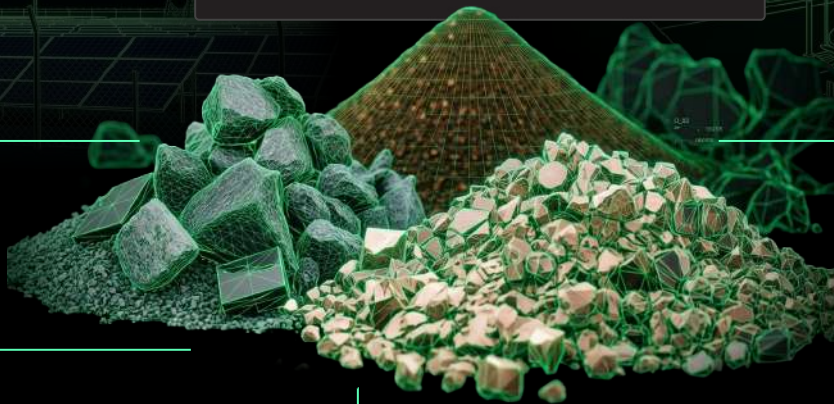
Physical industries will scale like software once fully electrified + autonomous



Ginkgo Bioworks produces synthetic microorganisms through genetic engineering



Cambium USA synthesizes high-performance materials for extreme conditions across land, air, sea, and space



Isomorphic Labs is discovering new drugs using AI



Boston Materials has engineered patented carbon fiber for aerospace, automotive, and electronics



Aionics\* uses an AI material discovery engine to make batteries more efficient and 10x less flammable

\*UP.Partners Portfolio Company

**THESE SHIFTING TIDES ACROSS GEOPOLITICS  
AND THE ELECTRO-INDUSTRIAL STACK ARE  
ERODING THE FAMILIAR INVESTMENT  
PARADIGM.**



THE  
**KINETIC  
AGE**  
2026

# VENTURE CAPITAL IS EVOLVING

# AI IS RESETTING THE SOFTWARE INDUSTRY

Since the AI trade began in public markets, enterprise software companies have traded down to 3-5x revenue. Compare this to 10-15x multiples of 2021.

“

Software is eating the world, but AI is going to eat software.”

— Jensen Huang in 2017



## SOFTWARE MELTDOWN

Icon	Ticker	Company	Market Cap	% YTD	Chart 1Y	% 1Y	Δ 52W High
	FIG	Figma	\$13.5B	-28.62%		-76.46%	-80.98%
	TTD	Trade Desk	\$15.2B	-17.83%		-74.39%	-75.05%
	DUOL	Duolingo	\$6.5B	-20.17%		-60.64%	-74.11%
	HUBS	HubSpot	\$14.6B	-30.63%		-64.18%	-68.38%
	MNDY	monday.com	\$6.0B	-21.58%		-53.44%	-66.03%
WIX	WIX	WIX	\$4.9B	-14.75%		-63.21%	63.90%
	TEAM	Atlassian	\$31.4B	-26.35%		-55.99%	-63.37%
	ASAN	Asana	\$2.5B	-24.04%		-51.80%	-57.31%
	CVLT	Commvault	\$3.9B	-30.96%		-40.46%	-56.44%
	DOCS	Doximity	\$7.2B	-14.15%		-33.62%	-55.08%
	KVVO	Klaviyo	\$6.8B	-30.72%		-50.80%	-54.53%
	BRZE	Braze	\$2.4B	-36.69%		-52.70%	-54.33%
	IOT	Samsara	\$16.4B	-20.97%		-44.34%	-54.17%
	GTLB	SiTlab	\$5.8B	-9.27%		-51.00%	-53.55%
	NOW	ServiceNow	\$119.3B	-25.49%		-50.12%	-51.26%
	DOCU	DocuSign	\$10.5B	-23.17%		-44.78%	-46.92%
	GWRE	Guidewire	\$12.6B	-26.29%		-28.72%	-45.79%
	ESTC	Elastic	\$7.1B	-10.42%		-40.28%	-43.07%
	CLBT	Cellegible	\$3.7B	-15.41%		-36.31%	-41.98%
	CRM	Salesforce	\$198.3B	-20.01%		-40.18%	-39.41%
	WDAY	Workday	\$45.3B	-20.01%		-35.14%	-39.32%
	INTU	Intuit	\$138.0B	-24.91%		-16.35%	-39.02%
	ADBE	Adobe	\$118.8B	-17.48%		-34.48%	-37.86%
	SAP	SAP	\$242.8B	-17.92%		-28.10%	-36.46%
	DDOG	Datadog	\$45.1B	-6.27%		-11.17%	-36.21%
	VEEV	Veeva	\$33.9B	-7.65%		-11.19%	-33.56%
	SNOW	Snowflake	\$68.2B	-9.35%		+9.06%	-28.18%
	ZETA	Zeta	\$4.8B	-5.97%		+7.55%	-27.18%
	ADP	ADP	\$99.4B	-4.33%		-18.19%	-25.45%
	FSLY	Fastly	\$1.4B	-8.62%		-11.19%	-25.02%
	ADSK	Autodesk	\$53.9B	-14.03%		-16.34%	-22.67%
	CFLT	Confluent	\$10.9B	-0.89%		+1.46%	-19.42%
	TWLO	Willio	\$18.6B	-14.10%		-16.01%	-19.42%
	MDB	MongoDB	\$30.3B	-12.03%		+33.54%	-16.43%
	ZM	Zoom	\$27.0B	+5.57%		+4.46%	-6.85%

Share price performance, past six months

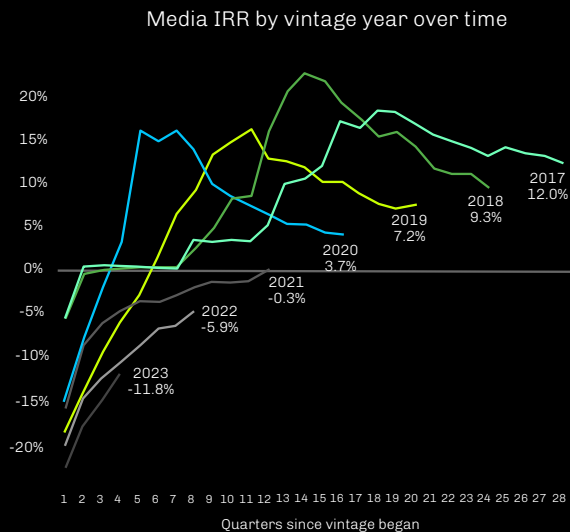


# THE TRADITIONAL VC PLAYBOOK IS UNDER PRESSURE

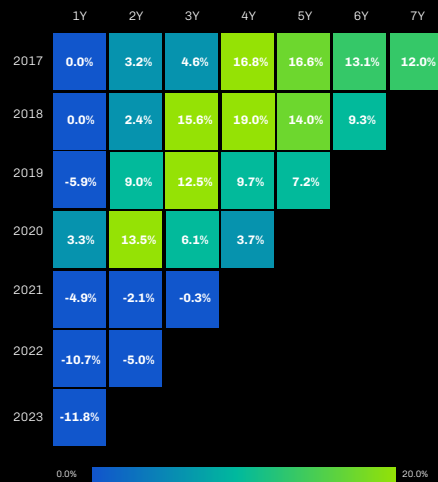
Median fund sizes have expanded, but exit multiples have compressed.

## Median IRR for 2021 fund remains below zero after 3 years

Median net IRR\* by quarters since vintage began / Data as of Q4 2024

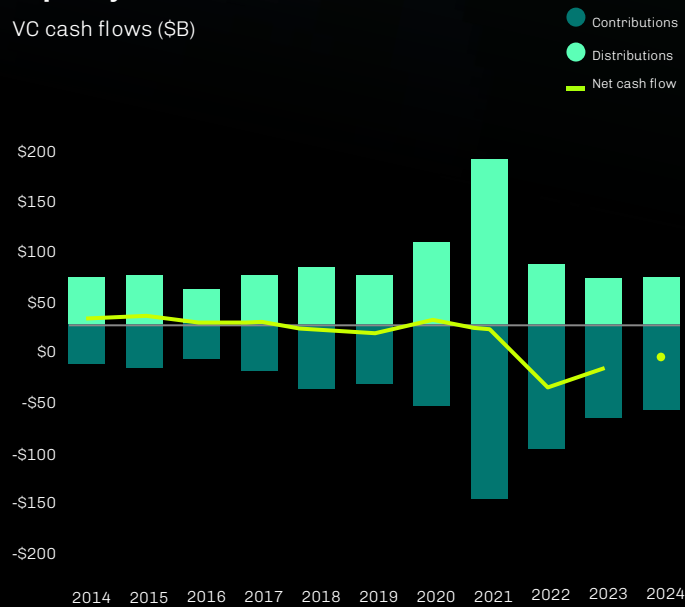


Median IRR by vintage year at select points



## Liquidity remains constrained

VC cash flows (\$B)



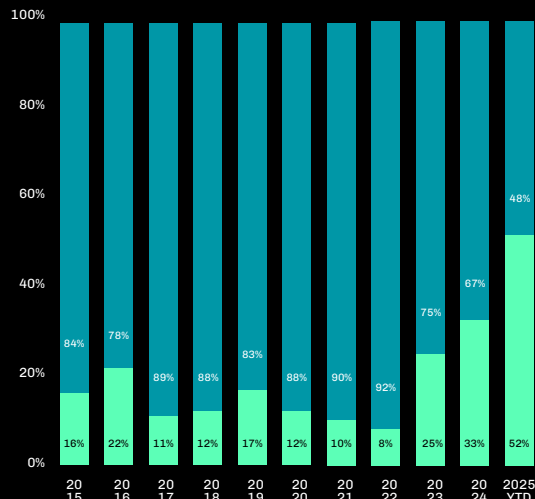
# UNPRECEDENTED CAPITAL CONCENTRATION ACROSS ALL ASSET CLASSES

## PRIVATE COMPANIES

The top 10 companies received over half of the capital invested in 2025

### \$'s Invested

■ Top 10 Deals ■ Other Deals

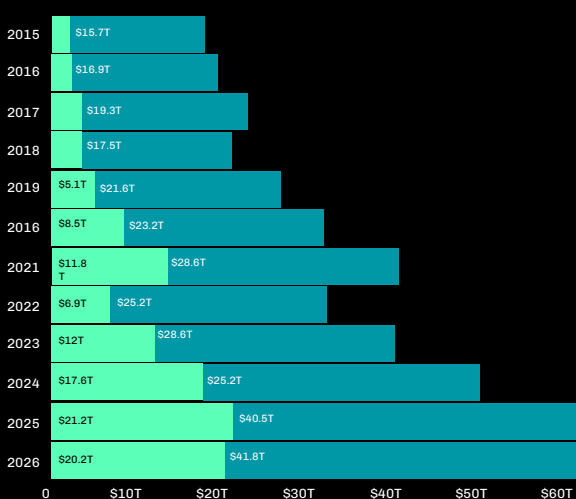


Source: Coatue, 2025 Market Commentary Compound Annual Meeting

## PUBLIC MARKETS

Magnificent 7 is 32.6% of S&P; compare to 12.5% in 2016

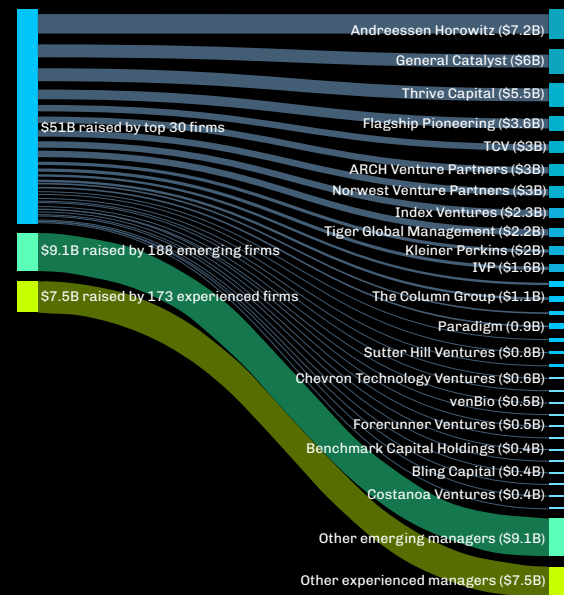
■ Magnificent 7 Market Cap ■ Remaining S&P 500 Market Cap



Magnificent 7 = NVDA, AAPL, GOOG, MSFT, AMZN, META, TSLA  
Source: The Motley Fool data as of February 16, 2026

## VENTURE CAPITAL

The top 30 funds capture three quarters of all venture capital raised



Source: PitchBook data as of December 4, 2024

In this landscape, returns depend on access. In order to generate alpha, investors must leverage sector expertise and asymmetric insight.

# DO BIG CHECKS LEAD TO CHECKMATE?

Unprecedented early-stage valuations and back-to-back funding rounds aim to preemptively establish category leaders. These strategies distort the Darwinian milestone-based funding that has historically underpinned venture returns.

## Kingmaking noun

king·mak·ing 'kiŋ-, mā-kiŋ

: the act or process of deploying massive funding into one startup in a competitive category, aiming to overwhelm competitors with a bank-account advantage so significant that it creates the appearance of market dominance.

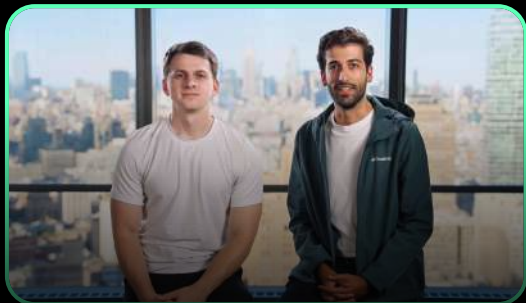
## Coconut Round noun

co·co·nut round | 'kō-kə-, nət raʊnd

: a term coined in early 2026 to describe an initial venture funding round of hundreds of millions of dollars, typically at valuations exceeding \$1 billion.

This dynamic is particularly pronounced in Defense and Frontier AI, markets which don't benefit from the same network-effects that made blitzscaling so effective for Web 2.0 (e.g. Uber, Airbnb).

\* DualEntry



Accounting software valued at **\$415M with only \$400k ARR\***

Shield AI



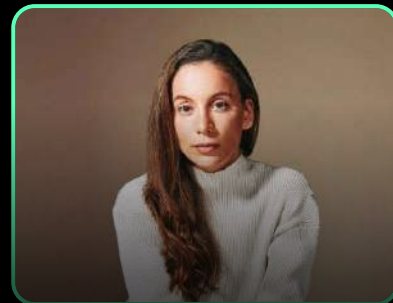
ShieldAI raised **\$240M at a \$5.3B valuation** on 20x revenue multiple

humans&



Humans& raised a **\$480M Seed at \$4.8B valuation**

THINKING MACHINES

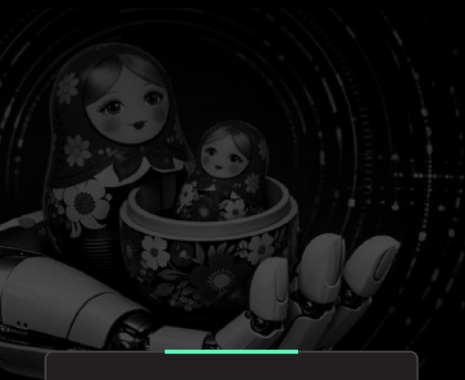


Founded by former OpenAI CTO, raised **\$2B Seed at \$10B valuation**

\*As reported by TechCrunch

# VENTURE IS NOW BACKING BUSINESS MODELS IT USED TO IGNORE

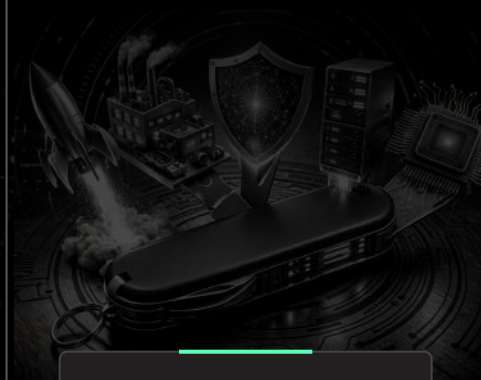
## PE Rollups



Modernizing and improving operating efficiency of legacy businesses to create multiple arbitrage

SCALE

## Holding Companies



Centralized go-to-market with decentralized technology development

STRUCTURE

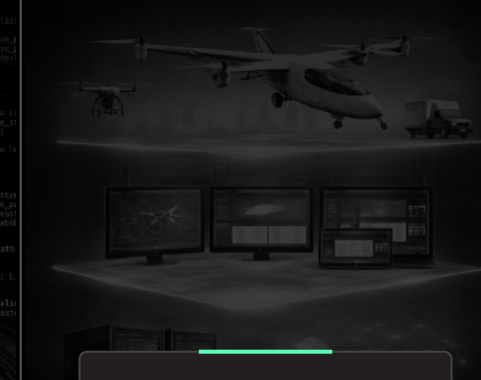
## Forward-Deployed Engineering



Integrating customization into scalable company platforms to boost retention and build long term advantage

PROXIMITY

## Full Stack HW/SW



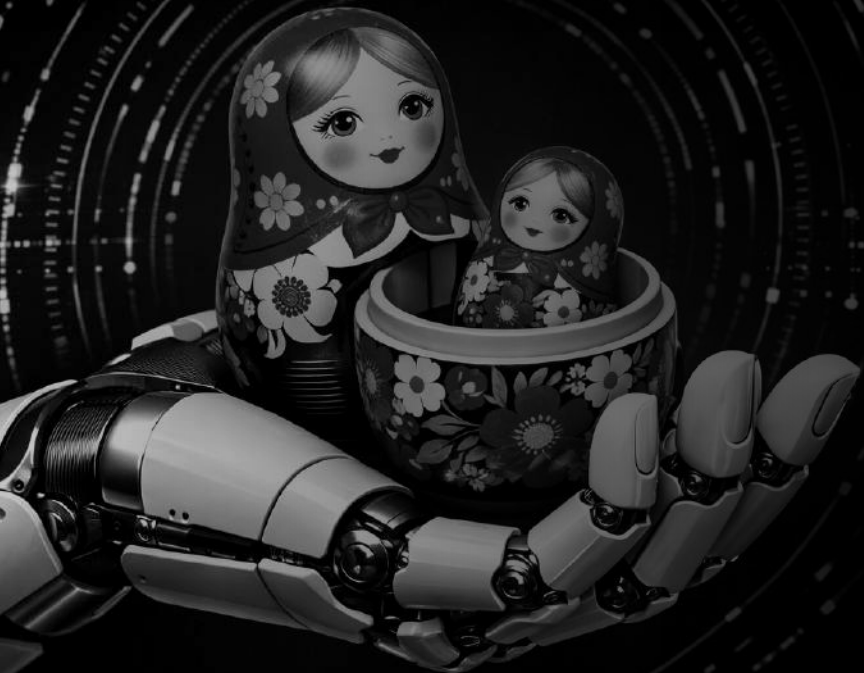
As the barrier of entry falls to zero for software, defensibility persists at the intersection of hardware and software

VERTICAL INTEGRATION

CREATING DEFENSIBILITY THROUGH:

# THE ROLLUP RENAISSANCE

VC's are now investing in the Private Equity consolidation playbook in fragmented, technology-enabled markets.



Metropolis\* raised \$1.6B to execute their “growth buyout” model across parking infrastructure



re:Build raised \$525M to acquire and unify specialty manufacturers across defense, aerospace, and energy



AMCA is rolling up precision manufacturing suppliers into a unified industrial platform



Isembard is reshoring UK manufacturing by pioneering the “franchise model for machine shops”

# THE VENTURE-BACKED HOLDCO: A NEW INDUSTRIAL BLUEPRINT

Rather than building a single product, these startups are built to own and scale multiple “product companies.”

Decentralized engineering and centralized go-to-market infrastructure creates efficiency across capital and talent



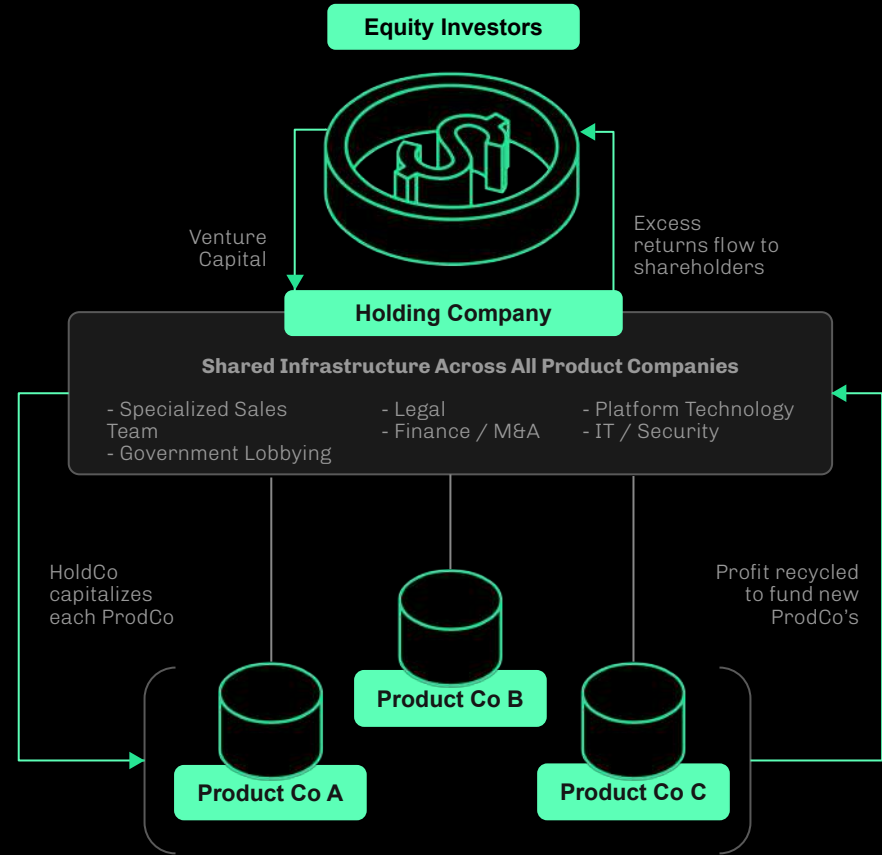
Valinor is a defense platform assembling mission-critical suppliers into a next-generation prime contractor



Redwire is a space infrastructure platform structured to acquire and integrate specialized aerospace assets



Takton is a manufacturing platform comprised of point-solutions to modernize the industrial base



CAPITAL STRUCTURE IS BECOMING A COMPETITIVE ADVANTAGE

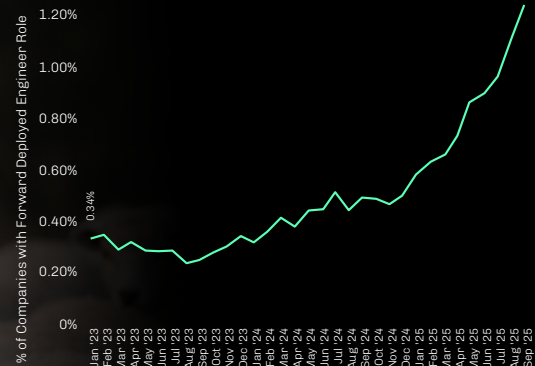
# THE RISE OF THE FORWARD-DEPLOYED ENGINEER

Palantir was once a pariah. Now everyone's stealing their business model.

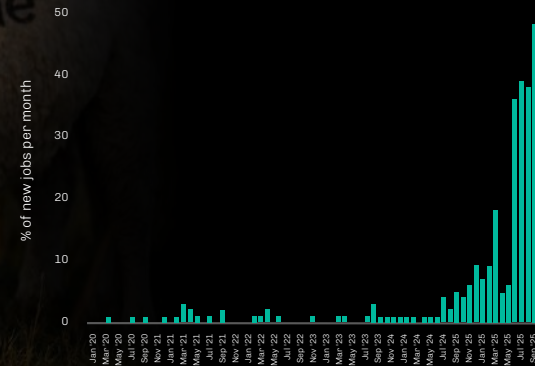
FDEs are embedded within the customer's organization to understand domain context, stitch together siloed data systems, and develop custom workflows. **The goal is to deliver capability, not software.** This model creates a long-term advantage by elevating switching costs and retention.



More companies are deploying FDEs



Number of new FDE job postings per month



Sources: a16z, "Forward-deployed Job Titles" (January 2026);  
Pave, "Is the Forward Deployed Engineer (FDE) on the Rise?" (November 2025);  
Bloomberg, "What I learned analysing 1K forward deployed engineer jobs" (November 2025)


# FULL-STACK IS BACK

As AI continues to commodify code, true defensibility increasingly lies in the physical world rather than the digital one. UP.Partners believes the most successful companies of the next decade will tightly couple hardware and software development.




“The DoD doesn’t want to buy software or hardware, the DoD wants to buy capabilities.”

— Three-Star General Ross Coffman at UP.Summit '24



**HAVOC**

Havoc\* deeply imbeds its vessels with custom-built software capable of orchestrating swarms of heterogeneous assets.



**Shield AI**

Shield AI aimed to modernize the Air Force with its autonomy software, but discovered that they must offer a Full-Stack vehicle to win major Programs of Record and grow into its \$5.3B valuation.



## SAFETY

SW bugs can be patched; HW failures cannot. Integration → catastrophic risk mitigation



## SPEED

Proximity between SW/HW teams → fast pace and competitive advantage

**UNIFIED, INTEGRATED DEVELOPMENT  
COMPRESSES RISK AND TIME SIMULTANEOUSLY**

Shared architecture → faster fault isolation and higher uptime



## RELIABILITY

Clarity for regulators → less friction in navigating bureaucracy



## REGULATION

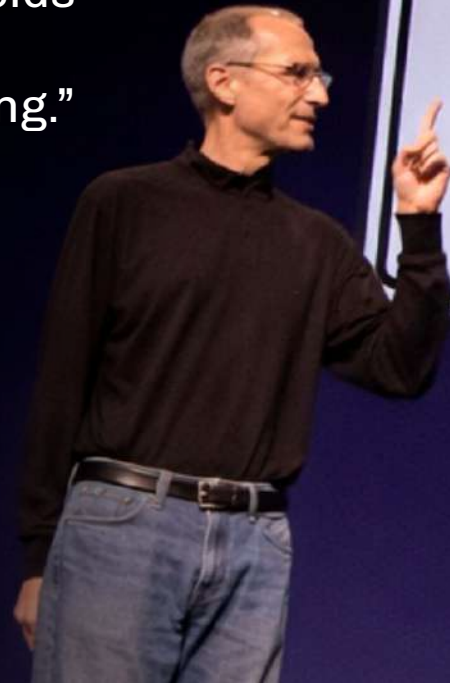
**IN A WORLD OF ABUNDANT CAPITAL,  
ENERGY, AND INTELLIGENCE, VALUE  
CONCENTRATES IN WHAT REMAINS  
DISTINCTLY HUMAN.**

THE  
**KINETIC  
AGE**  
2026

# ARTISANSHIP IN THE AGE OF AI

“Technology alone is not enough — it's technology married with liberal arts, married with the humanities, that yields us the results that make our hearts sing.”

— Steve Jobs

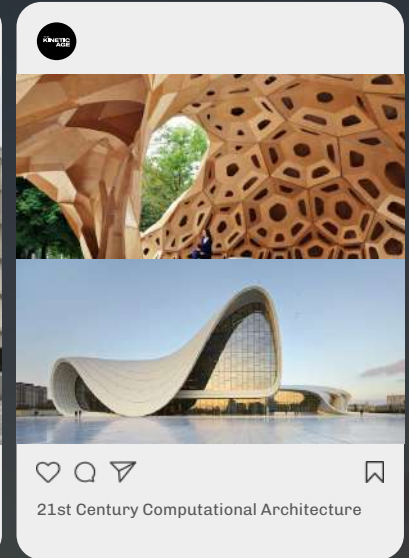
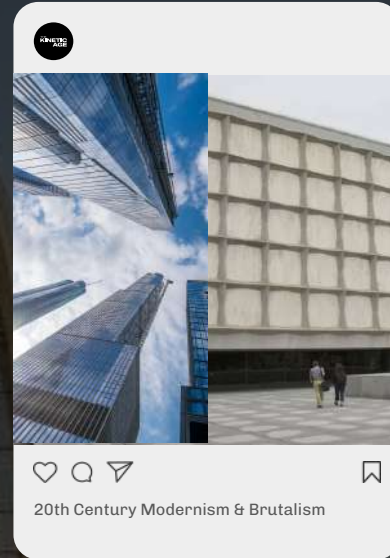
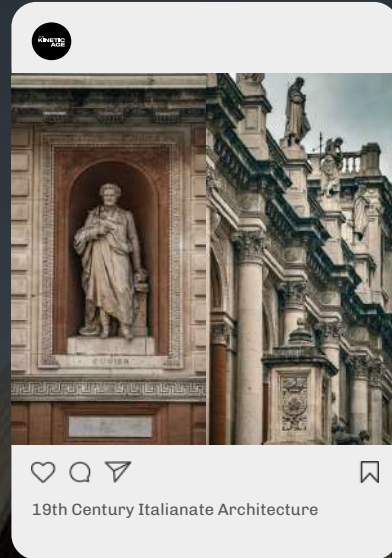


# WHAT IS THE AESTHETIC OF THE 21ST CENTURY?

“...What should the future actually look like?”

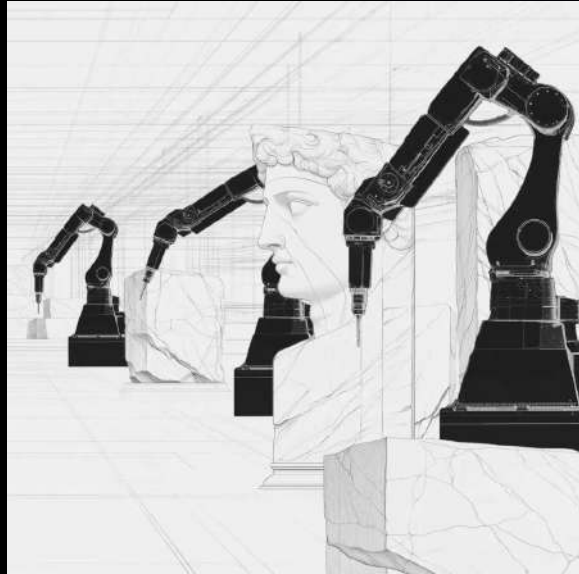
— Collison Brothers

“A Call For New Aesthetics” is a grant of up to \$250K for artists, architects, and designers to try to answer this question.



# THE RESURGENCE OF THE ARTISAN

Monumental Labs is reviving the ancient craft of stone carving with robots.



# MONUMENTAL LABS

Raised \$8M Seed in June, 2025



# AI ART MUSEUMS ARE OPENING SOON



Refik  
Anadol

is setting the tone for  
21st century aesthetics  
with data visualization  
and AI art

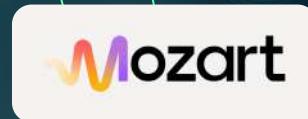
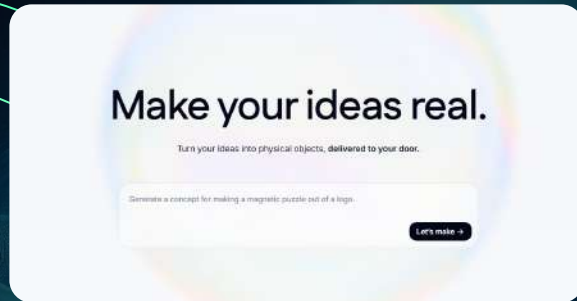
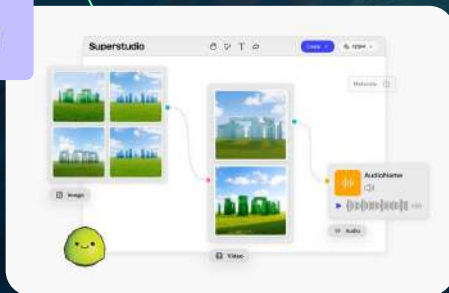




Womp's AI platform converts text prompts into usable 3D models

**Kaiber  
Superstudio**

Kaiber Labs Superstudio is an AI video generation engine created for artists by artists

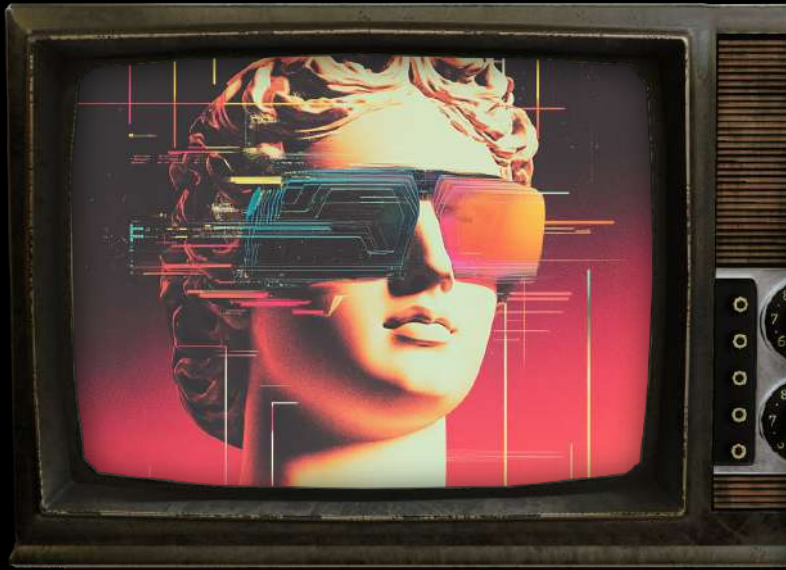


Mozart AI lets anyone tap into their inner composer

# ARTISTRY HAS NEVER BEEN MORE ACCESSIBLE

THE AI REVOLUTION HAS UNLEASHED A WAVE OF NOSTALGIA FOR OLD-SCHOOL AESTHETICS

# GANTRI



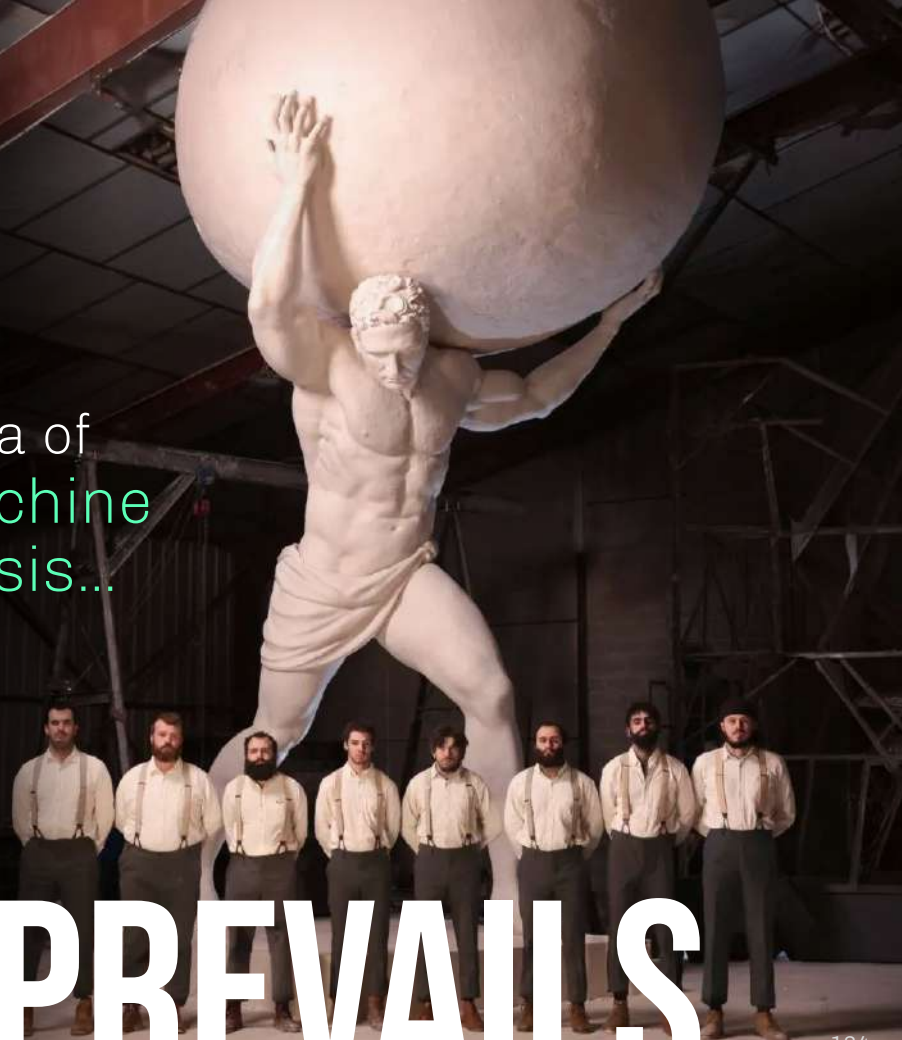
Gantri is digitally generating retro-inspired interior designs for Hyatt and West Elm

# TOOLS CHANGE. HUMAN INGENUITY DOES NOT

Atelier Missor intends to build 'the tallest statue in the West' to celebrate the United States' 250th birthday.



In the era of  
Man-Machine  
Symbiosis...



# HUMANITY PREVAILS.

# THE KINETIC AGE HAS ARRIVED

The transition from bits to atoms is now indisputable and irreversible. In this report, we've shown that physical AI is coming to life not as a product but as a re-architecting of the physical world. And traditional sources of capital aren't built for this paradigm shift.

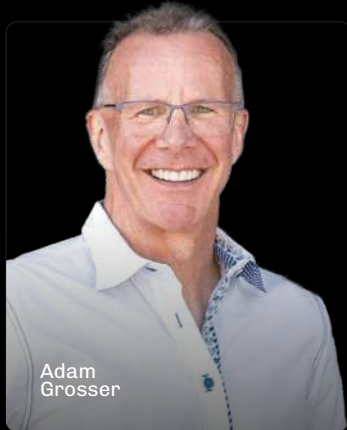
## **We are.**

We're a team of engineers, pilots, and industrialists. We deploy capital into companies that are fundamentally changing the world beyond software. We work shoulder to shoulder with industry titans across land, air, sea, and space. Our ecosystem unlocks billions of dollars in growth capital, infrastructure, and credit to support our portfolio companies from inception to scale.

If you're building the company that will define The Kinetic Age, we're here to build with you.

[submit@up.partners](mailto:submit@up.partners)

THE  
**KINETIC  
AGE**



Adam  
Grosser



Ben  
Marcus



Ally  
Warson



Alex  
Garcia  
Lautzenheiser

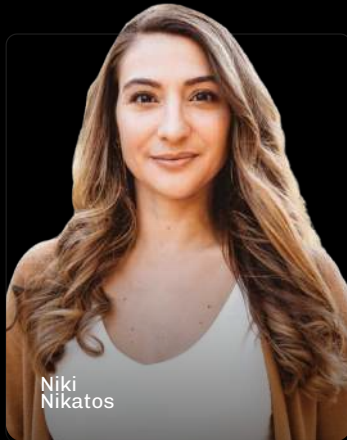


Jacob  
Andreesen

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**THANK YOU TO THE HUMANS WHO PUT THIS REPORT TOGETHER.**

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Niki  
Nikatos



Giu  
Ramos



Brian  
Adams



Austin  
Gunder



Claudia  
Morse

# ABOUT UP.PARTNERS

UP.Partners is a global investment firm building the ecosystem underpinning Physical AI — intelligent machines, infrastructure, and industrial systems transforming the physical economy. The firm backs founders building across robotics, manufacturing, energy, defense, logistics, and space.

For more information, visit [www.up.partners](http://www.up.partners) or follow on X @UpPartnersVC or LinkedIn.

For questions or media inquiries, please reach out to [press@up.partners](mailto:press@up.partners).





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