# ACT TECH RADAR

## DEFENCE TECHNOLOGY TRENDS

Science and technology (S&T) have underpinned U.S. military dominance for decades, but accelerating Chinese investment has transformed the global technological landscape, turning it into a contested battlespace. A recent **CSIS report therefore argues that S&T should be understood as a warfighting domain in its own right**, akin to air or cyberspace, where advantage is temporary and success depends on rapid adoption, wide integration, and the ability to adapt faster than competitors.

Chinese firms now compete at or dominate the global frontier in electric vehicles, batteries, renewable energy, telecommunications, robotics, drones, and biotechnology, reshaping global supply chains in the process. These civilian advances translate directly into military capability: the People's Liberation Army integrates AI into command, targeting, surveillance, and autonomous operations, including large-scale drone swarms and AI-driven battle management systems. Automation further accelerates China's military modernisation through autonomous systems, intelligent logistics, robotics, and AI-enabled decision tools, reinforcing the view that technological competition now defines strategic advantage.

CSIS | Foreign Affairs

# NATO COUNTRIES AND PARTNERS


- **AI progress is increasingly limited not by chip design alone, but by access to reliable, scalable electricity**. Competitive advantage now hinges on how effectively nations convert power into sustained, real-world AI output through full-stack optimisation spanning hardware, software, networking, and physical infrastructure. Without tightly aligning compute strategy with ambitious energy and grid modernisation policy, the US risks losing its leadership in AI.

CSIS

- Nearly two months after its rollout, the **Pentagon's GenAI.mil platform has been adopted enterprise-wide by five of the six US military services** and used by roughly 1.1 million users, signalling a rapid move toward standardised generative-AI adoption. The initiative builds on large Defence Department contracts with major commercial AI firms

Defense Scoop

- The U**.S. Army's Global Response Force will begin evaluating the AI-enabled Bumblebee V2 drone interceptor in March** under a $5.2 million Pentagon contract with Perennial Autonomy. The quad-rotor system autonomously identifies and destroys hostile drones by colliding with them mid-air, providing a cost-effective, low-risk countermeasure suited to modern battlefields.

Defense News

- Germany's **Helsing and HENSOLDT** are partnering to **upgrade the CA-1**, an uncrewed, **AI-piloted collaborative combat aircraft** designed to operate alone or in swarms alongside crewed jets, into a fully AI-enabled combat air system. The aircraft, expected to be operational in 4 years, is intended to execute missions autonomously with secure, networked data processing.

Breaking Defense

- The US Air Force has successfully tested **AI-driven tactical autonomy through "Project Have Remy,"** where an experimental X-62A Vista jet independently performed evasive maneuvers against a simulated missile. Additionally, **Lockheed Martin's "Project Overwatch"** demonstrated an AI model on the F-35 that can resolve ID ambiguities among unknown emitters in real-time, significantly reducing pilot decision latency.

Defense One | Breaking Defense | Defense News


**The European Defence Agency is laying the groundwork for a sovereign, military-grade data-sharing system** that would allow European armies **to exchange sensitive information securely without reliance on US infrastructure**. The intention is to develop a federated platform designed to improve interoperability, speed decision-making, and enhance operational readiness, with full operational capability targeted by 2030. The initiative responds to concerns about dependency on foreign, particularly American, cloud and data services, and is closely linked to parallel efforts to **develop a sovereign European military cloud.**

Euractiv


The **democratisation of long-range precision strike** is being driven by Ukraine's rapid development and scaling of low-cost, high-precision drones and cruise missiles. Enabled by an innovation ecosystem that draws heavily on civilian technical talent, **Ukrainian firms are producing deep-strike systems at unprecedented cost-effectiveness**. These capabilities are already supporting operational-depth strikes targeting logistics, energy infrastructure, and war-sustaining industry, lowering traditional barriers to entry for deep-strike capabilities.

Yet scaling affordable strike platforms is only part of the equation. To translate volume and precision into sustained operational advantage, **Ukraine has introduced Mission Control**, a nationwide digital C2 system that **centralises planning, execution, and analysis across millions of drone missions**, embedding data-driven feedback directly into force management and accelerating the shift towards managed, technology-enabled warfare. Within this broader transformation, Ukraine aims to establish a **15-kilometre unmanned "kill zone"** along the front line, **the Drone Line**, using dense layers of drones to detect and strike Russian forces before they reach Ukrainian positions and create a persistent defensive buffer.

Atlantic Council | Defense News | Defense News

During NATO's Steadfast Dart 2026 exercise, **a Bayraktar TB3 executed a live strike and safely recovered to its host vessel**. The mission marked the first complete combat profile flown by a Turkish shipborne UAV within a NATO exercise, confirming Türkiye's transition from testing to an operational shipborne UAV capability integrated into allied C2 structures.

The deployment positions **this drone-carrier** model as a **credible contributor to NATO maritime deterrence.**

Defence Industry Europe | Army Recognition

The Marine Corps has launched a new standardised **training programme to certify hundreds of Marines as small drone operators** while the Army has introduced its first "Best Drone Warfighter" competition, signalling a doctrinal shift toward **embedding drone operators directly within frontline infantry** and is planning to open a drone marketplace that will allow private companies to sell directly to units, with soldiers rating and reviewing products.

At the same time, the Pentagon's $1.1 billion **Drone Dominance Program will buy more than 300,000 small drones** to expand capacity across the entire US military. At the service level, Chief of Naval Operations Adm. Daryl Caudle has also proposed **creating a dedicated Robotic and Autonomous Systems warfighting commander** to unify surface, subsurface and aerial drone swarms into coordinated, cross-domain combat formations.

National Defense | Defense One | Defense News | Defense Scoop | Defense Scoop

**Lockheed Martin** unveiled **Lamprey**, a modular, electrically powered multi-mission autonomous undersea vehicle (MMAUV) that can **gather intelligence, deploy sensors**, **launch uncrewed aerial systems for surveillance and kinetic strike**, and **launch lightweight torpedoes**. Additionally, it can loiter on the ocean floor, offering a low stealth profile, and recharge its batteries by attaching to a host ship or submarines.

TWZ | Defense News

**Poland** has selected a consortium led by Kongsberg Defence & Aerospace and PGZ to build a **nationwide counter-drone "wall"** known as the San system. The programme will deliver 18 counter-UAS batteries with dozens of firing and command units, supported by hundreds of vehicles, with deliveries starting in 2026. Meanwhile, **Germany is expanding its uncrewed military capabilities** through major framework agreements with Stark and Helsing for loitering munitions, beginning with an initial €268.6 million order, while also receiving from Israel Aerospace Industries the first BlueWhale autonomous submarine. The unmanned vessel is designed for anti-submarine warfare, reconnaissance and other maritime missions.

Defence News | Politico | Defense News


**German-British startup Hypersonica** tested a hypersonic missile prototype in Norway, reaching speeds above Mach 6 and a range over 300 km.

The **company aims to deliver Europe's first sovereign hypersonic strike capability by 2029**. Hypersonica positions itself as a faster and cheaper private-sector alternative to traditional state-led hypersonic weapons programmes.

Defense News | Interesting engineering

US firm Ursa Major has unveiled the **HAVOC hypersonic missile system**, a medium-range weapon that can be launched from fighter aircraft, bombers, ground-based vertical launch systems and potentially from space. **Designed for rapid manufacturing at scale**, the system prioritises affordability and speed to deployment. Its debut comes as all major U.S. military branches pursue hypersonic programmes. The development reflects a **U.S. push to close the hypersonic capability gap with Russia and China**, which currently lead in deployment and testing;

Defense News


**Q-Day**, the moment **quantum computers can break today's public-key encryption**, is no longer a distant theoretical milestone but a **looming operational risk**. Recent breakthroughs have accelerated timelines, with leading researchers now expecting encryption-breaking quantum machines to emerge in the 2030s rather than several decades out. Against this backdrop, Google has escalated the issue from a technical warning to a policy and infrastructure imperative, urging policymakers and industry to immediately accelerate adoption of post-quantum cryptography, math-based algorithms designed to remain secure against quantum attacks. If left unaddressed, this shift creates a **cybersecurity risk with direct military implications.**

The Meridiem | RC Wireless | Nature

**Lockheed Martin and Fujitsu limited have signed an MOU to jointly accelerate quantum computing development for dual-use applications**. Under the agreement, the two companies will combine systems integration expertise and commercial-scale technologies to strengthen quantum capabilities alongside advanced sensing, AI, microelectronics, and next-gen networks.

ASD News

**OQC and QinetiQ have shown that quantum computing can solve a real-world defence problem.** By applying a quantum optimisation algorithm, they identified critical weak points in mobile military communication networks that could cause major disruption if attacked. The breakthrough demonstrates that quantum technology can already improve national security planning and help protect critical communications systems.

Quantum Zeitgeist


**A CSIS report highlights the relevance of The Golden Dome** initiative, arguing that the U.S. homeland missile defences were built for limited ballistic threats and no longer match a security environment defined by hypersonic weapons, cruise missiles, drones, and multi-domain attacks that can reach the US from any direction. The report highlights what is described as **"the end of the geographic sanctuary",** noting that the Atlantic and Pacific Oceans no longer guarantee the strategic depth and protection the US once relied upon. In line with this new reality Golden Dome reflects a broader **shift in U.S. thinking refocusing the attention on homeland defense**.

CSIS

The **US is prioritising private industry and AI integration as central pillars of its pursuit of American space dominance.** This model is being operationalised through the Pentagon's **Golden Dome,** which combines acquisition reform and AI to compress timelines, reduce costs and integrate space-based sensors, interceptors and automated C2. Another example of how the Pentagan is leveraging private industry is **"Ghost Recon",** a Defense Innovation Unit initiative that leverages commercially built satellites capable of conducting close-range inspections in geosynchronous orbit to enhance US space surveillance and resilience**.**

Breaking defense | News Nation | Air and Space Forces | Space News | Defense News

**SpaceX and Blue Origin have abruptly shifted focus to lunar development**, with SpaceX stepping back from its Mars city plans and Blue Origin pausing its New Shepard tourism flights to prioritise moon-related projects. The **move follows a White House directive to advance the Pentagon's Golden Dome missile shield and re-establish an American presence on the moon** by 2028. While low Earth orbit satellites enable rapid missile detection, they remain vulnerable to anti-satellite weapons, creating security risks for space-based defence systems. A stronger foothold on and around the moon would place communications and sensing infrastructure far beyond most current counter-space threats.

Defense News

**Germany plans to spend €35 billion on military space capabilities**. Under the plan, Germany will deploy an encrypted constellation of more than 100 satellites to secure communications, improve resilience, and develop **inspector satellites, jamming and lasers**. In parallel, Germany is developing the **"Spock" radar satellite system** to **deliver all-weather military imagery**, though the programme is facing significant cost overruns. The satellites developed are intended to support deployments such as Panzerbrigade 45 in Lithuania with improved surveillance and early warning.

Reuters

A **CNAS report argues that converging advances in gene editing, synthetic biology, and human–machine interfaces are creating transformative capabilities that could strengthen U.S. defense,** reshore critical supply chains and revitalise manufacturing. However, although the US is the global biotechnology leader, it lacks a coherent long-term strategy. To sustain its edge, the report calls for a focused US national biotechnology strategy that streamlines fragmented regulation, prioritises biomanufacturing through the DoD and DARPA, and better coordinates public–private investment. Central to this effort is unlocking the value of biodata, currently siloed across disconnected systems, by enabling secure, interoperable, and privacy-preserving access, especially as China aggressively amasses biodata to fuel its own biotechnological rise.

CNAS

# STRATEGIC COMPETITORS


- PLA-linked research indicates China is developing lethal, autonomous drone swarms tailored for urban warfare, with Taiwan as a central scenario. This effort reflects the **PLA's "intelligentization" phase**, which seeks to delegate battlefield decision-making to AI moving from human-in-the-loop systems toward fully autonomous use of force.

The Diplomat

- A CSET report analyzing over 9,000 publicly available **PLA** AI-related documents, finds that the country is **investing heavily in AI-enabled decision support systems, maritime and undersea sensing, space sensing and targeting-related algorithms, surveillance technologies, cyber capabilities, and multi-domain C2** tools designed to accelerate and improve operational decision-making. The PLA is also expanding AI applications in the cognitive domain, including deepfake generation and detection, sentiment analysis, and information manipulation tools. The reports indicates sustained experimentation in support of China's push toward **AI-enabled "intelligentized" warfare**.

CSET


- **Russia has introduced a major tax incentive to boost domestic drone production**, signalling its determination to sustain a drone-driven war effort in Ukraine. However, longstanding weaknesses in advanced hardware manufacturing and continued reliance on smuggled Western components and Chinese and Iranian support make **true technological self-sufficiency unlikely**. Instead, the policy is more likely to channel resources into the military-industrial complex and further tighten state control over Russia's technology sector.

Defense News

- **China unveiled the Wing Loong X (WL-X)**, a large, long-endurance unmanned combat drone designed primarily for maritime surveillance and strike missions, including surface targeting and potential anti-submarine warfare support. Analysts assess it as a **strong export contender** due to competitive pricing, fewer export restrictions, and growing technological maturity make it particularly attractive to states seeking affordable, non-Western maritime airpower.

Defense News


- **China is developing ultra-small hypersonic glide missiles that can be launched from standard 80mm naval or anti-aircraft guns**, reaching speeds close to Mach 6 and engaging aircraft or drones more than 20km away at high altitude. Their extreme velocity and compact size significantly reduce detection and reaction times, with simulations indicating up to a 99% kill probability even against sharply manoeuvring targets. If validated beyond simulations, the technology could reshape naval and air defence strategies by altering how distributed, high-speed firepower is deployed in future warfare.

Interesting Engineering | SCMP


- **China has signalled an unprecedented expansion of its space ambitions, filing plans for 203,000 satellites** across multiple mega-constellations. This massive scale-up is part of a broader global rush into low Earth orbit and is expected to intensify pressure on already strained satellite and launch supply chains worldwide. At the same time**, China's space programme is contending with signs of instability** that could complicate those ambitions. Recent launch failures involving the Long March 3B and Ceres-2 have underscored reliability concerns within segments of its launch sector. Although Beijing still plans to place a data centre in orbit within five years, US experts increasingly view that timeline as unlikely.

Breaking Defense | Wall Street Journal


**China is consolidating a strategic advantage in AI-enabled biotechnology** by investing heavily in state-directed, tightly integrated ecosystems that link biodata, AI development, and defence applications. Without prompt action, the U.S. risks falling behind China in a field with direct implications for military resilience, supply chain security, and future biothreat preparedness.

Just Security


**China is defining modern energy dominance by controlling the technologies and infrastructure that power electrified economies**. While current U.S. policy emphasises fossil fuel production and exports, Beijing has spent two decades building an integrated, state-backed ecosystem spanning **renewables, batteries, grid infrastructure, nuclear power, and advanced manufacturing**. As electricity demand surges with AI, data centres, and electrified industry, the country that builds and integrates energy infrastructure will hold strategic advantage, and China is currently better positioned to do so.

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