

EMERGING TECH RESEARCH

# Vertical Snapshot: Defense Tech Update

VC trends, industry overview, and market landscape

2024

Published on July 5, 2024





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# Executive summary

- VC investment in defense tech remained steady from 2022 to 2023, with \$35.8 billion across 800 deals in 2022 and \$34.9 billion across 627 deals in 2023. So far in 2024, \$9.1 billion has been invested across 228 deals, contrasting with the broader VC market's decline and indicating the sector's robustness. Over the past 12 months, key investment areas included renewable energy generation & storage (\$4.4 billion); advanced computing & software (\$3.7 billion); sensing, connectivity & security (\$3.7 billion); and space technology (\$3.5 billion).
- Exit activity has been modest, with \$2.2 billion across 39 exits in 2023 and \$8.3 billion across 35 exits so far in 2024. M&A activity increased from \$4.6 billion across 56 deals in 2022 to \$9.3 billion across 53 deals in 2023. 2024 has seen \$5.2 billion across 36 deals, suggesting continued acquisitions by larger players to expand their product portfolios.
- In 2015, the Defense Innovation Unit (DIU) was established to integrate commercial technologies into national defense. Evolving from DIU 1.0 through DIU 3.0, it now focuses on scaling capabilities for strategic impact. In April 2023, the DIU was realigned to directly report to the secretary of defense, enhancing its influence. Fiscal year 2023 achievements include 33 new solicitations; 1,768 commercial proposals; 90 prototype contracts worth \$298 million; and a cumulative transition rate of 51%.<sup>1</sup> Notable projects span AI; drones; cyberthreat telemetry; and international collaborations with India, the UK, Australia, and Japan. The DIU also secured \$983 million in funding for fiscal year 2024—up from \$191 million in 2023.<sup>2</sup> The National Security Innovation Capital (NSIC) received \$35 million to support startups and attract private investments. The Office of Strategic Capital (OSC) released its fiscal year 2024 strategy, which focuses on component-level technologies, financial tools to attract private investment, and lending to minimize taxpayer burden, with priority areas in advanced materials, biotechnology, 5G, microelectronics, quantum science, renewable energy, and space technology.<sup>3</sup>
- The Department of Defense's (DoD's) National Defense Industrial Strategy highlights the need for innovation and venture capital to revitalize the US defense industrial base, especially in response to China's dominance in shipbuilding and microelectronics. Despite traditional contractor challenges, US manufacturing construction spending doubled to \$200 billion between 2022 and 2023,<sup>4</sup> creating significant investor opportunities. Conflicts in Eastern Europe and the Middle East emphasize the need for a resilient defense industrial base, with the DoD investing in munitions production and expanding precision-guided munitions capacities to maintain technological superiority.
- The defense acquisition process is shifting toward more open and flexible approaches, as seen with the DIU's facilitation of over 450 contracts and the "Open" topics of the US Air Force's Small Business Innovation Research (SBIR) program. This encourages nontraditional defense contractors and startups to propose innovative solutions, boosting VC funding and integration into defense applications. The continuous threat environment, particularly from drones, necessitates rapid innovation, as seen with Epirus' high-power microwave system and the Army's investment in counter-drone technologies. This dynamic landscape presents opportunities for venture capital to engage with DoD modernization programs and global defense technology markets.

1: "The Defense Innovation Unit FY 2023 Annual Report," US Department of Defense, n.d., accessed June 17, 2024.

2: "Defense Innovation Unit Would Get Major Funding Boost in Spending Bill," C4ISRNet, Courtney Albon, March 21, 2024.

3: "Investment Strategy for the Office of Strategic Capital: Fiscal Year 2024," US Department of Defense, March 8, 2024.

4: "Total Construction Spending: Manufacturing in the United States," FRED, June 3, 2024.



# Introduction

This report serves as PitchBook's updated defense tech Vertical Snapshot, building upon the [comprehensive analysis published in Q2 2023](#). Utilizing largely the same methodology, this edition includes a slight change to the taxonomy: Electronic warfare has been replaced by counter-unmanned aerial systems to reflect evolving priorities in defense technology. The report features an updated view of the defense innovation ecosystem, followed by a timeline of significant events over the past year. It delves into industry dynamics that have emerged as defense tech has gained more media traction, presents VC activity by year and by quarter, and analyzes investments by stage. Additionally, it highlights the categories receiving the most investment over the past 12 months, exit activity, M&A trends, key players, and notable deals. We encourage readers to refer to the 2023 report for a foundational understanding of defense technology and the ecosystem that supports it. Previous reports on [space tech](#), [advanced manufacturing](#), and [semiconductors](#) provide valuable context and insights. For further in-depth research and more refined company lists, please explore the [defense tech workspace](#) available on the PitchBook Platform.



# Defense innovation ecosystem

## Defense Innovation Unit

In 2015, the DIU was established to integrate commercial technologies into national defense. The DIU has evolved from building relationships between the DoD and the commercial sector (DIU 1.0) to demonstrating rapid technology acquisition (DIU 2.0). Now, under DIU 3.0, the focus is on scaling these capabilities for strategic impact.

In April 2023, Secretary of Defense Lloyd J. Austin III realigned the DIU to be his direct report, enhancing its impact. DIU 3.0 involves embedding with war fighters, partnering with the DoD's scaling engines, catalyzing the defense innovation ecosystem, enhancing partnerships with the commercial tech sector, and strengthening international ties. As the DIU takes on a more central role in the Pentagon's innovation ecosystem, Congress is proposing significant funding increases: nearly \$800 million more in 2024 and growing to over \$1.3 billion in 2025.<sup>5,6</sup> This substantial boost signals a strong demand for commercial technology from the DoD.

Fiscal year 2023 saw significant metrics and achievements for the DIU:<sup>7</sup>

- 33 new solicitations posted.
- 1,768 commercial proposals received (up 8% from the previous year).
- 90 prototype contracts awarded, totaling \$298 million.
- 10 commercial solutions transitioned, raising the cumulative transition rate to 51%.

5: "Defense Innovation Unit Would Get Major Funding Boost in Spending Bill," C4ISRNet, Courtney Albon, March 21, 2024.

6: "House Appropriators Propose More Than \$1.3B for DIU, Other Tech Acceleration Initiatives," DefenseScoop, Jon Harper, June 4, 2024.

7: "The Defense Innovation Unit FY 2023 Annual Report," US Department of Defense, n.d., accessed June 17, 2024.

Since its inception, the DIU has awarded 450 prototype Other Transactions contracts, transitioned 62 prototypes, and attracted over \$68 billion in private investment.<sup>8</sup> Notable projects include:

- **Blue Unmanned Aerial Systems 2.0:** Secure and reliable small drones.
- **Air Logistics Optimization:** AI to optimize fuel consumption for DoD aircraft.
- **Cyber Threat Telemetry:** Expansion of US Cyber Command's threat intelligence capabilities.
- **National Capital Region Integrated Air Defense System:** AI-based visual recognition system.
- **Small-Class Unmanned Underwater Vehicle:** Advanced modular designs for mine countermeasures.

The DIU also highlighted key projects in AI, machine learning (ML), autonomy, and cyber- and telecommunications. International collaborations were strengthened with India, the UK, Australia, and Japan, focusing on joint technology development and innovation challenges.

In fiscal year 2023, the NSIC received \$35 million in appropriations, awarded contracts to startups, and supported technical progress that attracted substantial private investments. Throughout the fiscal year, the DIU expanded engagements with private capital partners, facilitating new financing structures to support the scaling of defense-related technologies.

The DIU's fiscal year 2023 activities underscore its role in integrating commercial technology into national defense, fostering partnerships, and scaling innovations. The strategic realignment and focus on DIU 3.0 present opportunities for investors to engage with defense technologies and contribute to national security advancements.

8: Ibid.



## DEFENSE INNOVATION ECOSYSTEM

### Office of Strategic Capital

The OSC released its fiscal year 2024 investment strategy, which can provide investors with guidance on the innovative technologies the OSC is prepared to de-risk and where it will augment private capital investing.<sup>9</sup> The OSC's framework complements existing DoD initiatives with a focus on three main areas:

- **Components (not capabilities):** The OSC invests in crucial component-level technologies such as advanced materials, biotechnology, and advanced manufacturing that are essential for supply chains but often overlooked in direct procurement.
- **Finance (not innovation):** The OSC increases available capital through financial tools such as loans and guarantees, working with federal partners to attract private investment rather than relying on government spending through contracts or grants.
- **Lending (not spending):** The OSC uses credit-based financial tools, ensuring capital is repaid, thus minimizing taxpayer burden and utilizing best practices from over 100 federal credit programs.

The OSC supports early-stage investments via loan guarantees to funds licensed under the Small Business Administration's Small Business Investment Companies (SBIC) program, aiding companies developing critical component technologies that face high research & development (R&D) costs and technical risks. For later-stage technologies, the OSC provides loans or guarantees to scale production, helping companies overcome investor reluctance due to the need for demonstrated sales.

<sup>9</sup>: ["Investment Strategy for the Office of Strategic Capital: Fiscal Year 2024," US Department of Defense, March 8, 2024.](#)

The investment prioritization approach includes:

- **Enabling technologies:** Identifying industries that support multiple DoD priorities.
- **Market share dynamics:** Assessing US competitiveness.
- **Strategic capital need:** Identifying areas needing public support.
- **Security impact:** Evaluating the potential to enhance security through technological development and supply chain security.

Initial priority areas for the SBIC Critical Technologies Initiative include:

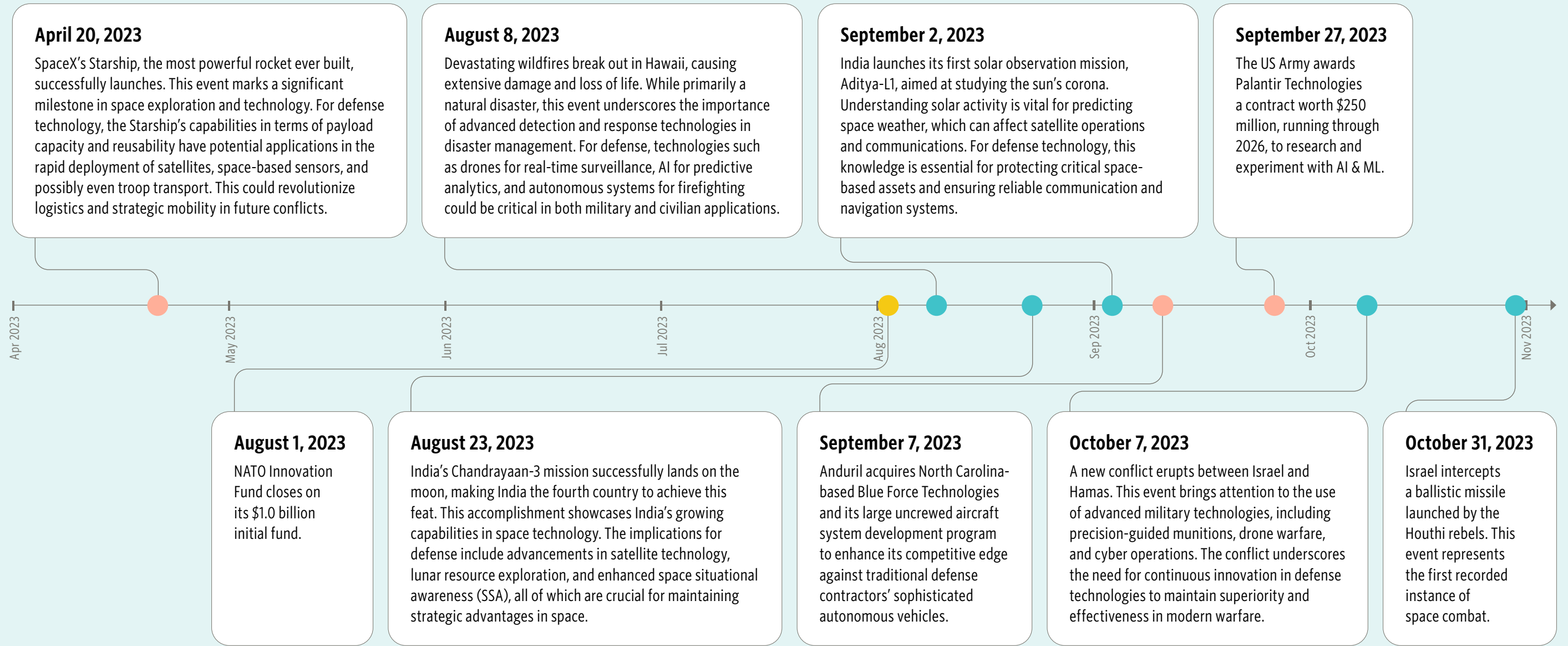
- **Advanced materials:** Nanomaterials and metamaterials.
- **Biotechnology:** Bioenergetics and synthetic biology.
- **FutureG and 5G:** Open Radio Access Network.
- **Integrated sensing and cyber:** Sensor hardware.
- **Microelectronics:** Assembly, testing, packaging, and materials.
- **Quantum science:** Quantum computing, security, and sensing.
- **Renewable energy:** Battery storage.
- **Space technology:** Space-enabled services and equipment.

The OSC aims to attract private capital to these critical sectors, leveraging public funds to create a multiplier effect, thus ensuring the US maintains its technological edge.



# Defense tech timeline

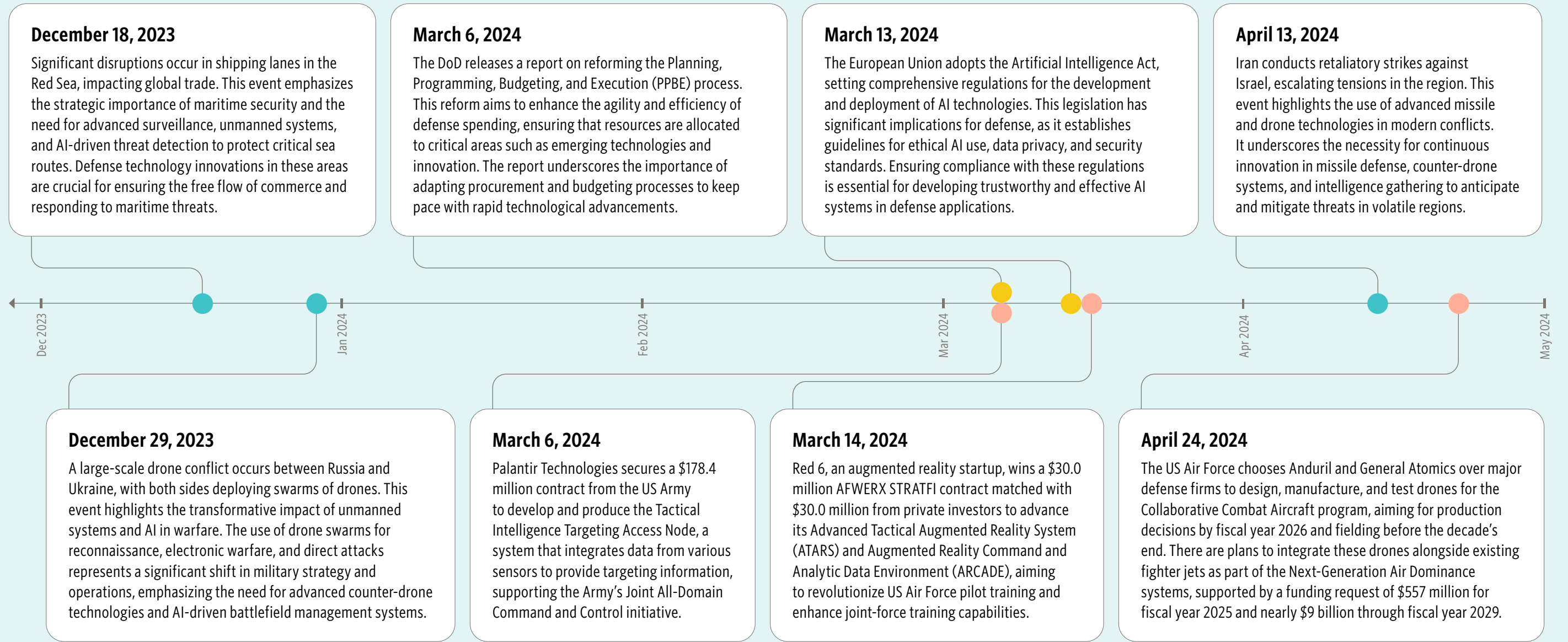
● Government initiatives ● Commercial events ● Geopolitical events





## DEFENSE TECH TIMELINE

● Government initiatives ● Commercial events ● Geopolitical events







# Industry dynamics

## The need for an expanded defense industrial base

The DoD's National Defense Industrial Strategy emphasizes the need for fresh ideas and venture capital to rejuvenate the US defense industrial base,<sup>10</sup> which has been eclipsed by China's dominance in sectors such as shipbuilding and microelectronics. Traditional defense contractors struggle with adopting advanced manufacturing technologies, as large companies are often less nimble and startups are often better at tackling difficult problems, such as creating reusable rockets. Yet with US manufacturing construction spending doubling from \$100 billion to \$200 billion between 2022 and 2023,<sup>11</sup> investor opportunities in defense tech abound. Companies such as Hadrian and Nominal have raised \$117.0 million and \$20.0 million, respectively, for their advanced manufacturing capabilities, demonstrating potential across all investing stages in defense tech.

The 2022 invasion of Ukraine by Russia and ongoing tensions in the Middle East highlight the necessity for continuous munitions output and robust supply chains. The US defense industry employed about 1.1 million workers and encompassed nearly 60,000 companies as of 2021, with DoD spending totaling \$390.5 billion in fiscal year 2022.<sup>12</sup>

For more on advanced manufacturing investment trends, please refer to our [2024 Vertical Snapshot: Advanced Manufacturing](#).

10: "National Defense Industrial Strategy," US Department of Defense, 2023.

11: "Total Construction Spending: Manufacturing in the United States," FRED, June 3, 2024.

12: "The U.S. Defense Industrial Base: Background and Issues for Congress," Congressional Research Service, October 12, 2023.

The DoD is investing in munitions production, prioritizing the expansion of production capacities for precision-guided munitions, such as Tomahawk cruise missiles. This aims to ensure that the US military can sustain high expenditure rates and maintain technological superiority in prolonged conflicts, enhancing deterrence and readiness.

## Pivot to open acquisition processes

The acquisition process within the defense sector is undergoing a significant transformation, moving away from the traditional model of prescriptive requirements to a more open and flexible approach. This pivot involves issuing broad problem statements and allowing the industry to propose innovative solutions, fostering a competitive and dynamic environment. The DIU has been at the forefront of this shift, facilitating over 450 contracts with nontraditional defense contractors since its inception, totaling more than \$5.5 billion in funding.<sup>13</sup> Similarly, the US Air Force's SBIR program has adopted "Open" topics that allow firms to propose technologies without specific guidance, as opposed to the more prescriptive "Conventional" topics.

The Open topic format has been shown to attract more applications with higher win rates.<sup>14</sup> Firms winning Open topic awards are more likely to secure VC funding, indicating strong commercial potential, and are also more likely to secure additional non-SBIR DoD contracts, highlighting successful integration into defense applications.

This open solicitation process encourages a wider range of participants, including nontraditional defense contractors and startups, to contribute their expertise and solutions. By providing a clear

13: "The Defense Innovation Unit FY 2023 Annual Report," US Department of Defense, n.d., accessed June 17, 2024.

14: "Opening Up Military Innovation: Causal Effects of Reforms to U.S. Defense Research," National Bureau of Economic Research, Sabrina T. Howell, et al., April 2021.



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demand signal to investors and startups, this approach helps to accelerate the adoption of emerging technologies and streamline the procurement process. The positive outcomes from the Open topic awards suggest that policymakers should consider expanding the use of open solicitations to further stimulate innovation and technology transition in both commercial and defense markets.

### A continuous threat environment

The proliferation of cheap yet effective technologies, such as drones, has created a continuously evolving threat environment that poses significant risks to national security. These technologies can be easily acquired and deployed by state and nonstate actors, necessitating extensive sensor networks and sophisticated monitoring systems capable of detecting, deterring, and intercepting such threats. To address this, the US Army has invested over \$1 billion in counter-drone technologies and electronic warfare systems in recent years.<sup>15</sup>

A notable advancement in counter-drone technology is Epirus' recent contract with the Army's Rapid Capabilities and Critical Technologies Office (RCCTO) for prototypes of its Leonidas high-power microwave system, designed to neutralize drones by zapping their electronics. In 2023, Epirus was awarded \$66.1 million to deliver several prototype systems under the Other Transaction Authority.<sup>16</sup> This contract includes options for additional support services, and Epirus plans to demonstrate and support these prototypes. Following successful testing, the RCCTO aims to transition Leonidas into a future program of record, ensuring the integration of this advanced capability into the Army's defenses.

15: "Drone Corps Proposal Would Disrupt US Army Plans, Says Undersecretary," C4ISRNet, Courtney Albon, May 17, 2024.

16: "Epirus Wins \$66M Army Contract for Drone-Frying Leonidas Microwave Kit," C4ISRNet, Colin Demarest, January 23, 2023.

This dynamic threat landscape underscores the necessity for rapid innovation and adaptability within the defense industrial base. The continuous threat environment demands distributed, layered, and low-cost sensor systems to reduce points of failure and enhance resilience. Highlighting the growing importance of advanced sensor technologies, [Hidden Level raised \\$20.0 million in January 2024](#) from investors including Booz Allen Ventures and Valor Equity Partners, putting its valuation at \$120.0 million.

### Space tech is fueling dual-use innovations

Over the past year, there has been \$3.5 billion in VC funding in the space tech sector, highlighting significant investment interest and potential growth. Advancements in satellite technology are impacting this segment, an important area for dual-use technology. Reduced launch costs, primarily due to SpaceX, have facilitated the entry of various satellite companies into space, increasing the demand for satellite data.

The DIU is contributing to this growth with its Hybrid Space Architecture,<sup>17</sup> which integrates commercial satellite broadband innovations with military networks. This initiative, involving eight selected vendors, including startups such as Aalyria and Anduril, aims to enhance the space tech segment's capabilities.

The Space Rapid Capabilities Office is also investing in satellite technology by engaging 20 firms to compete for up to \$1 billion in task orders for command and control software for highly maneuverable satellites.<sup>18</sup> This highlights the importance of advanced software in managing satellite

17: "Defense Innovation Unit Solicits New Round of Proposals for Space Network Project," SpaceNews, Sandra Erwin, November 29, 2023.

18: "Space Rapid Capabilities Office Slates \$1B for Dynamic Space Ops C2," Breaking Defense, Theresa Hitchens, June 7, 2024.



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operations. One of these firms, True Anomaly, operates in SSA and provides a technology platform intended to enhance space security and protect national interests. The company combines training and simulation tools, spacecraft manufacturing infrastructure, and autonomy systems to improve space security, stability, and sustainability. True Anomaly raised \$100.0 million in Series B venture funding in December 2023 led by Riot Ventures, with participation from Narya, Eclipse Ventures, Champion Hill Ventures, ACME Capital, Menlo Ventures, 645 Ventures, Rocketship.vc, Overmatch, and FiveNine Ventures.

[SSA is essential for monitoring space activities](#), preventing collisions, and ensuring the safe operation of satellites—crucial for both military and civilian applications.

### **The growing relationship between the DoD and Silicon Valley can enhance the defense tech landscape**

A notable trend is emerging in the defense technology investment landscape, characterized by the transition of former Pentagon officials and military officers into venture capital roles. Traditionally, retiring defense officials have moved into positions within established defense contractors such as Lockheed Martin and Boeing. However, a growing number are now joining venture capital and private equity firms that focus on defense tech startups. This shift is seen as an opportunity to leverage their extensive networks and expertise to potentially streamline the acquisition process for the Pentagon.

Prominent figures include Mark Esper, former Secretary of Defense, who is now with Red Cell Partners, a firm investing in military software and counter-drone technology.<sup>19</sup> Similarly, Ryan

<sup>19</sup>: [“New Spin on a Revolving Door: Pentagon Officials Turned Venture Capitalists,” The New York Times, Eric Lipton, December 30, 2023.](#)

McCarthy, former Secretary of the Army, joined Scout Ventures, which backs robotics and aerospace startups. Raj Shah, former Managing Partner at the DIU, and Michael Brown, former Director of the DIU, are now with Shield Capital investing in autonomous cargo delivery and defense software companies. Another notable figure is James Geurts, former Assistant Secretary of the Navy, who is now with the US Innovative Technology Fund focusing on automated maintenance assessments and satellite technologies.

These former defense officials bring significant experience and connections, which can be valuable in navigating the Pentagon’s procurement processes. Their interactions with DoD officials and members of Congress can facilitate advocacy for the startups they support, sometimes resulting in policy changes and increased funding allocations. While there is optimism regarding acquisition reform, there remains a need for clear demand signals and greater funds allocated to effective procurement units to ensure the success of these new initiatives.

### **Venture capital is positioned take advantage of the DoD’s modernization programs**

The DoD has established a suite of autonomous software modernization programs ideal for VC investment.<sup>20</sup> Venture capital, particularly strong in software, is well positioned to benefit from these initiatives.

Systems integrators such as Booz Allen and SAIC are collaborating with companies such as Second Front Systems, which provides a security and cloud hosting platform to accelerate third-party application delivery and cloud adoption in public-sector markets. Its software configures, secures,

<sup>20</sup>: [“Software Modernization Implementation Plan Summary,” US Department of Defense, March 29, 2023.](#)



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and deploys compliant applications for government customers, offering a managed and compliant production environment.

Second Front Systems raised \$40.0 million in Series B funding on November 21, 2023, led by New Enterprise Associates, with a pre-money valuation of \$235.0 million. The funds will enhance the company's capabilities across classified networks and security regimes.

Likewise, the DoD has allocated \$500.0 million for the Replicator initiative in fiscal year 2024, aiming to deploy thousands of cost-effective autonomous systems by August 2025 to counter China's military expansion.<sup>21</sup> This initiative focuses on unmanned, "attritable" systems, such as kamikaze drones, unmanned surface vessels, and counter-drone systems.

The Replicator initiative involves both traditional and nontraditional vendors, leveraging commercial technology for defense purposes. It aims to rapidly field advanced technologies and adapt to evolving threats. The DIU leads the PRIME Commercial Solutions Opening, enabling companies to fast-track technologies for prototype contracts, thus diversifying the vendor base for unmanned systems.

### The rest of the world also provides a market opportunity

With war raging in Europe and tensions bubbling in the Pacific, many governments are leveraging the startup ecosystem to modernize their defense industries. NATO has launched a \$1.1 billion

<sup>21</sup>: ["Pentagon Secures \\$500M for First Tranche of Replicator Systems," DefenseScoop, Jon Harper, May 6, 2024.](#)

innovation fund to invest in defense technologies. The NATO Innovation Fund focuses on early-stage investments, from pre-seed through Series B, and may also make follow-on investments.<sup>22</sup> Initial checks are up to €15.0 million. NATO has also set up the Defence Innovation Accelerator for the North Atlantic (DIANA) to speed up the development of critical technologies through accelerator sites. To date, 44 companies have been awarded funding from DIANA.<sup>23</sup>

The Australian government has allocated AUD 1.0 billion over the next four years to support "targeting, long-range fires, theater logistics, fuel resilience and robotic and autonomous systems."<sup>24</sup> The UK has promised £10.0 billion over the next decade for munitions production and reforms of Britain's defense procurement procedures.<sup>25</sup> The British government is also establishing a new Defence Innovation Agency to boost military R&D.

The European Commission and the European Investment Fund have launched the Defence Equity Facility, a €175.0 million fund for the next four years to increase access to capital for small companies in the sector.<sup>26</sup>

These various outfits demonstrate the global pivot toward leveraging private capital markets with state funding to develop defense technology.

<sup>22</sup>: ["NATO Announces \\$1B Fund to Back Startups Supporting 'Safety, Freedom and Human Empowerment,'" TechCrunch, Ingrid Lunden, August 1, 2023.](#)

<sup>23</sup>: ["NATO DIANA Announces First Cohort of Innovators, Launches Call for Mentors," NATO, November 30, 2023.](#)

<sup>24</sup>: ["2024 Integrated Investment Program," Australian Government, April 17, 2024.](#)

<sup>25</sup>: ["UK Announces £75B Defense Boost — and Challenges Europe to Follow Suit," Politico, Stefan Boscia, April 23, 2024.](#)

<sup>26</sup>: ["EU Launches €175M Equity Fund to Prime Private Investment in Defence R&D," Science | Business, Eleonora Francica, January 16, 2024.](#)



# Taxonomy

We are maintaining the same taxonomy as last year's report, but we have removed the "electronic warfare" category and replaced it with "counter-unmanned aerial systems," which now falls under the autonomous systems segment. We encourage readers to view the [defense tech workspace](#) and other reports to gain a more refined understanding of different markets.

Our taxonomy is built around 14 critical technology areas identified by the Office of the Under Secretary of Defense for Research and Engineering and the White House's National Science and Technology Council.<sup>27, 28</sup> We focused on companies headquartered in Five Eyes countries that operate within the VC universe. Companies were chosen based on various factors, including prior government funding, existing government clients, and potential defense applications. Public companies were included only if they received government funding as startups. However, we note that certain segments and categories, such as renewable energy and information security, may be underrepresented due to the sheer scale of their respective markets, and we encourage readers to consult our other reports on those areas.

For a nuanced perspective, we have adopted a broad definition of "dual-use" in this report. Our goal is to assess funding levels across a wide array of critical technologies that could potentially serve national security objectives. We acknowledge that the term dual-use is contested and encourage readers to stay informed about ontological debates when evaluating the defense tech market. This report incorporates insights from various categories of dual-use technology, including commercial-commercial, defense-commercial, defense-defense, and commercial-defense, to provide a comprehensive understanding of the defense tech landscape.

<sup>27</sup>: "Critical Technology Areas," Office of the Under Secretary of Defense, Research and Engineering, n.d., accessed June 17, 2024.

<sup>28</sup>: "Critical and Emerging Technologies List Update," National Science and Technology Council, February 2022.



## TAXONOMY




Autonomous systems		
Subsegment/category	Description	Example company
<b>Unmanned ground vehicles</b>	Companies in this space develop self-driving land vehicles for military and civilian applications, such as cargo transport, reconnaissance, and security.	
<b>Unmanned surface vehicles</b>	Businesses in this category create autonomous surface and underwater vehicles used for tasks such as surveillance, mine detection, and oceanographic research.	
<b>Unmanned aerial vehicles</b>	Companies in this space focus on unmanned aerial systems, including drones and aerial platforms for purposes such as reconnaissance, communications, and payload delivery.	
<b>Defense systems integration &amp; optimization</b>	Businesses in this category develop software, algorithms, and systems that integrate different domains of defense technologies, enhance situational awareness, and optimize the overall effectiveness of defense and security operations.	
<b>Autonomous manufacturing</b>	Companies in this category develop and deploy technologies that enable machines to operate with little or no human intervention in manufacturing processes, including assembly, quality control, and logistics.	
<b>Counter-unmanned aerial systems</b>	Companies in this space develop technologies and methods to detect, intercept, and neutralize unauthorized aerial drones. These systems combine radar, electronic jamming, and physical interventions, serving crucial roles in military, commercial, and civilian security.	



Advanced materials & manufacturing		
Subsegment/category	Description	Example company
<b>Additive manufacturing &amp; maintenance</b>	Companies in this category specialize in 3D printing and digital twins technologies for rapid prototyping, manufacturing, and repair of defense and civilian components.	
<b>Advanced armor &amp; structural materials</b>	Companies in this category develop and manufacture advanced ceramic and composite materials for defense applications, including armor, structural components, electronics, and optics. The focus is on improving strength, weight, durability, and protection to enhance the capabilities of defense systems.	




Quantum sciences		
Subsegment/category	Description	Example company
<b>Quantum sensing &amp; networking</b>	Companies in this category develop sensors and networks that leverage quantum properties to enhance measurement and communication capabilities.	
<b>Quantum computing</b>	Companies in this space work on the development of quantum computers, which have the potential to solve complex problems faster than classical computers.	
<b>Post-quantum cryptography</b>	Firms in this category focus on cryptographic methods that are designed to be secure against attacks from quantum computers.	



## TAXONOMY

Sensing, connectivity & security		
Subsegment/category	Description	Example company
<b>Next-generation wireless networks</b>	Companies in this space are developing advanced wireless communication technologies, such as 5G and beyond, for improved connectivity and data transfer.	
<b>Advanced sensors</b>	Organizations in this category work on innovative sensor technologies for applications such as environmental monitoring, intelligence gathering, and navigation.	
<b>Information security</b>	Companies in this space work on securing communication networks and systems against cyberthreats.	





Semiconductors & microelectronics		
Subsegment/category	Description	Example company
<b>Semiconductors</b>	Companies in this category specialize in the design, manufacturing, and supply of semiconductor components and equipment, as well as software and automation tools for the design and simulation of microelectronic systems used in a range of applications, including modern electronics and defense systems.	
<b>Nanotechnology</b>	Businesses in this category work on the development and application of nanoscale materials and devices, which can enhance the performance of various defense systems.	




Human-machine interfaces		
Subsegment/category	Description	Example company
<b>Augmented &amp; virtual reality</b>	Companies in this category develop augmented reality and virtual reality technologies for applications such as training, simulation, and remote operation of defense systems.	
<b>Brain-computer interfaces</b>	Organizations in this category work on systems that enable direct communication between the human brain and computers, allowing for improved control and interaction with defense technologies.	
<b>Wearable technology</b>	Companies in this space create wearable devices that enhance human performance, communication, and situational awareness in defense and security operations.	


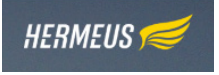




## TAXONOMY

Advanced computing & software		
Subsegment/category	Description	Example company
<b>Novel computing architectures</b>	This category includes companies that provide cloud-based infrastructure, platforms, and services for defense and security applications, and that develop edge computing solutions that enable data processing closer to the source, reducing latency and bandwidth requirements in defense applications.	 <b>HADEAN</b> BRIDGING PHYSICAL AND VIRTUAL WORLDS
<b>Data management &amp; analysis</b>	Businesses in this space work on technologies and solutions for efficient data storage, processing, and analysis in defense operations.	
<b>Development, security &amp; operations</b>	Companies in this space offer platforms that enable software developers to embed security protections within their code, test their code's vulnerabilities on a regular basis, and deploy application updates securely.	
<b>Supply chain management</b>	Companies in this space develop software and technology solutions to help manage and optimize the movement of goods and materials through the supply chain. This includes inventory tracking, logistics management, and demand planning, among other functions.	




Space technology		
Subsegment/category	Description	Example company
<b>Satellite systems</b>	Organizations in this category design, manufacture, and operate satellite systems for applications such as communications, surveillance, and navigation.	
<b>Space launch, re-entry &amp; navigation</b>	Companies in this space specialize in launch and re-entry vehicles and technologies for delivering payloads and personnel to and from space.	
<b>In-space services</b>	Businesses in this category focus on providing various services for orbital operations and space exploration. This includes satellite maintenance, in-orbit refueling, debris removal, and space-based manufacturing capabilities.	



Defense-specific		
Subsegment/category	Description	Example company
<b>Directed energy</b>	Companies in this category specialize in directed energy technologies, such as high-energy lasers and microwave weapons, for defense applications.	
<b>Hypersonics</b>	Businesses in this space work on the development and deployment of hypersonic systems, including missiles and vehicles, capable of traveling at speeds greater than Mach 5.	





## TAXONOMY

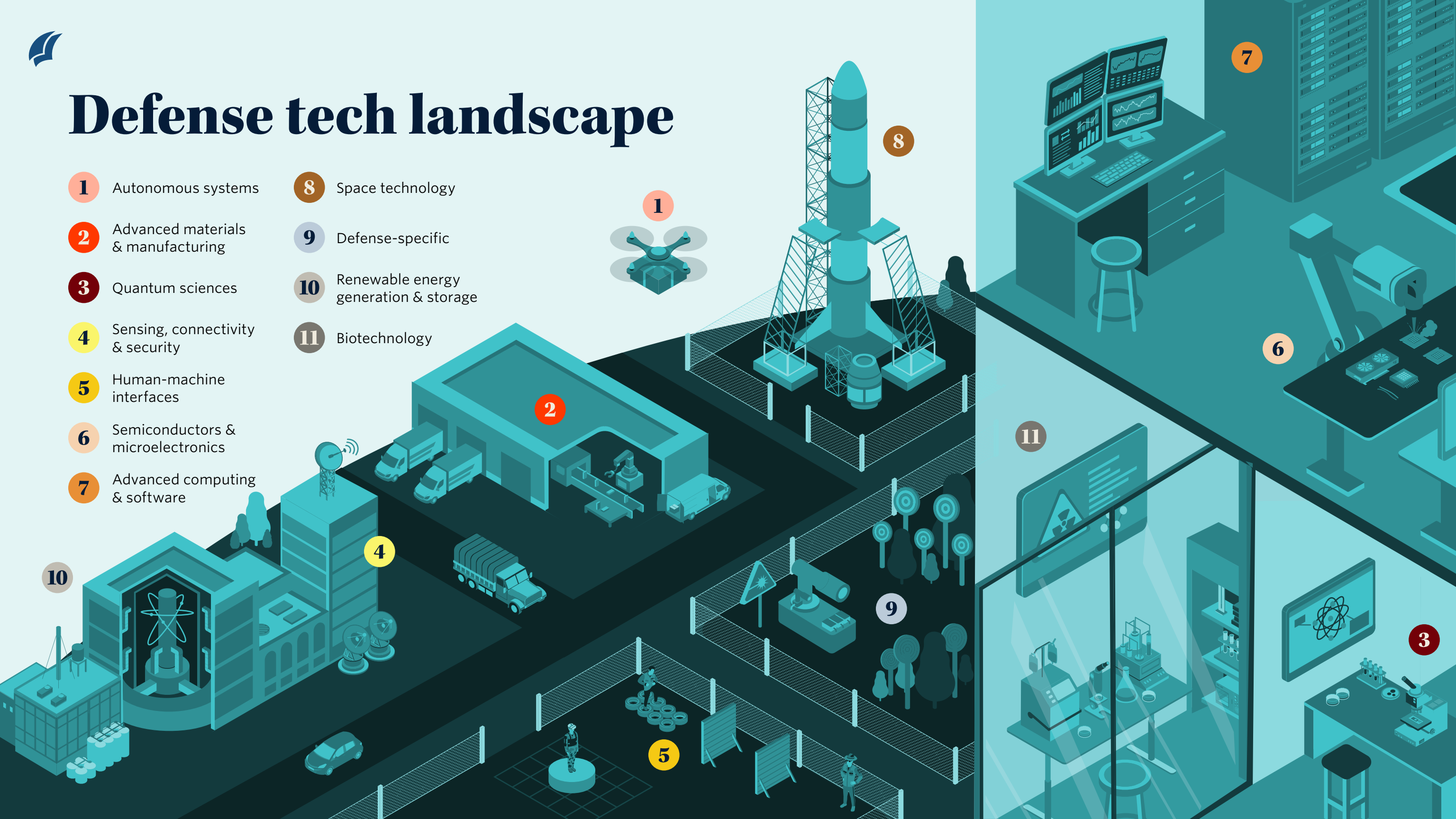
Renewable energy generation & storage		
Subsegment/category	Description	Example company
<b>Alternative energy generation</b>	Companies in this space develop renewable energy sources, such as solar, wind, and geothermal, for use in defense and civilian applications.	
<b>Advanced energy storage</b>	Businesses in this category work on innovative energy storage solutions, including batteries and capacitors, for improving the efficiency and reliability of energy systems.	
<b>Power systems</b>	Companies in this category develop technologies and solutions for efficient power conversion, management, and grid resiliency, serving both defense and civilian applications.	

Biotechnology		
Subsegment/category	Description	Example company
<b>Synthetic biology</b>	Businesses in this category focus on the engineering of biological systems for applications such as biofuels, materials, and drug development.	
<b>Biodefense</b>	Companies in this space work on technologies and solutions for detecting, monitoring, and mitigating the impacts of infectious diseases and pandemics.	



# Defense tech landscape

- 1** Autonomous systems
- 2** Advanced materials & manufacturing
- 3** Quantum sciences
- 4** Sensing, connectivity & security
- 5** Human-machine interfaces
- 6** Semiconductors & microelectronics
- 7** Advanced computing & software
- 8** Space technology
- 9** Defense-specific
- 10** Renewable energy generation & storage
- 11** Biotechnology





# Defense tech VC ecosystem market map

This market map is an overview of venture-backed or growth-stage companies that have received venture capital or other notable private investments. [Click to view the full map on the PitchBook Platform.](#)

## 1 Autonomous systems

Unmanned ground vehicles

Applied Intuition FORTERRA kodick

Unmanned surface vehicles

SALDRONE SARONIC BLACKSEA

Unmanned aerial vehicles

Shield AI Skydio MERLIN

Defense systems integration & optimization

ANDURIL falkonry picogrid

Autonomous manufacturing

Path Robotics HADRIAN Automata

Counter-unmanned aerial systems

EPIRUS FORTEM TECHNOLOGIES Hidden Level

## 2 Advanced materials & manufacturing

Additive manufacturing & maintenance

gecko FABRIC8LABS Freeform

Advanced armor & structural materials

BOSTON MATERIALS mosaic\*

## 3 Quantum sciences

Quantum sensing & networking

Infection Q-CTRL

Quantum computing

atom computing Maybell

Post-quantum cryptography

SANDBOXAQ QUANTUM

## 4 Sensing, connectivity & security

Next-generation wireless networks

DEEPWAVE BEARTOOTH AALYRIA

Information security

NOZOMI NETWORKS xage

Advanced sensors

PARAGRAF CHAOS

## 5 Human-machine interfaces

Augmented & virtual reality

LOOKING GLASS KIT-AR

Wearable technology

majo PISON

Brain-computer interfaces

Paradromics Blackrock Neurotech

## 6 Semiconductors & microelectronics

Semiconductors

groq AyarLabs

Nanotechnology

FORGE NANO Geisdyne

## 7 Advanced computing & software

Novel computing architectures

IO d-Matrix EnCharge AI

Data management & analysis

Dataminr Chainalysis Primer

Development, security & operations

SECOND FRONT Dropzone AI

Supply chain management

flexport decision sciences

## 8 Space technology

Satellite systems

ASTRANIS VECTOR XPLORE

Space launch, re-entry & navigation

Relativity FIREFLY STOKE

In-space services

AXIOM SPACE VARDA VOYAGER SPACE

## 9 Defense-specific

Directed energy

BLUEHALO

Hypersonics

SPINLAUNCH HERMEUS HYSONIC TECHNOLOGIES

## 10 Renewable energy generation & storage

Alternative energy generation

ELECTRIC HYDROGEN FERVO RADIANT

Power systems

AMS AMPERON

Advanced energy storage

ASCEND ELEMENTS Form energy LYTEN

## 11 Biotechnology

Synthetic biology

EMBODY Atomic AI CAMBIUM

Biodefense

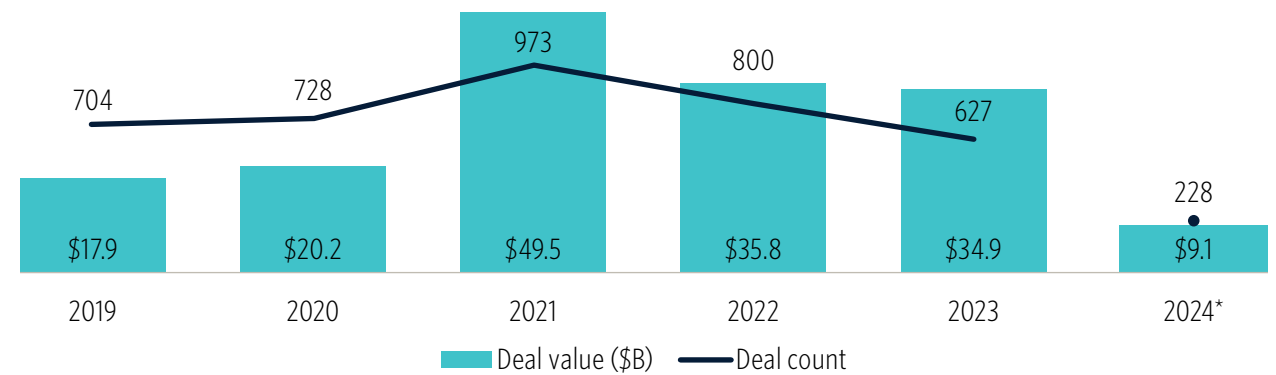
r.bio KRACKEN SENSE



# VC activity

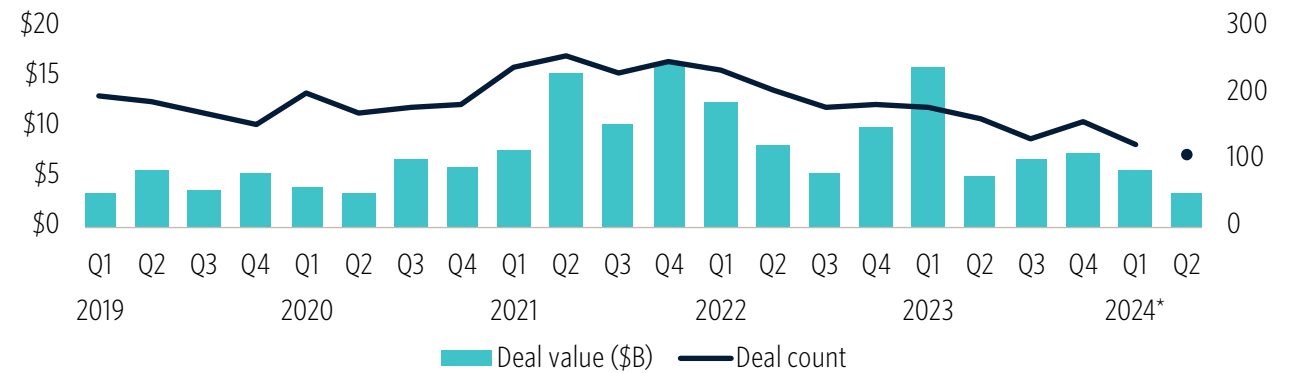
VC investment in defense tech remained steady from 2022 to 2023. In 2022, \$35.8 billion was invested across 800 deals, and in 2023, \$34.9 billion was invested across 627 deals. So far in 2024, \$9.1 billion has been invested across 228 deals. This stability in defense tech investing contrasts with the broader VC market's decline, indicating that companies in or adjacent to defense continue to attract funding and showcasing the sector's robustness and attractiveness to investors. Quarterly activity in 2023 showed a rise in deal value, with a peak in Q1, a decline in Q2, and subsequent increases. Over the past 12 months, the top investment categories were renewable energy generation & storage (\$4.4 billion across 61 deals); advanced computing & software (\$3.7 billion across 74 deals); sensing, connectivity & security (\$3.7 billion across 92 deals); and space technology (\$3.5 billion across 58 deals). These investments align with the DoD's priorities, such as sustainable energy solutions, software modernization, advanced sensors, network security, and dual-use space technology. However, exit activity has been modest, with \$2.2 billion across 39 exits in 2023, rising to \$8.3 billion across 35 exits in 2024. M&A activity has been significant, with \$4.6 billion across 56 deals in 2022, increasing to \$9.3 billion across 53 deals in 2023, and \$5.2 billion across 36 deals so far in 2024. This trend suggests larger players are likely to continue acquiring smaller companies to expand their product portfolios.

## Defense tech VC deal activity



Source: PitchBook • Geography: Global • \*As of June 17, 2024

## Defense tech VC deal activity by quarter

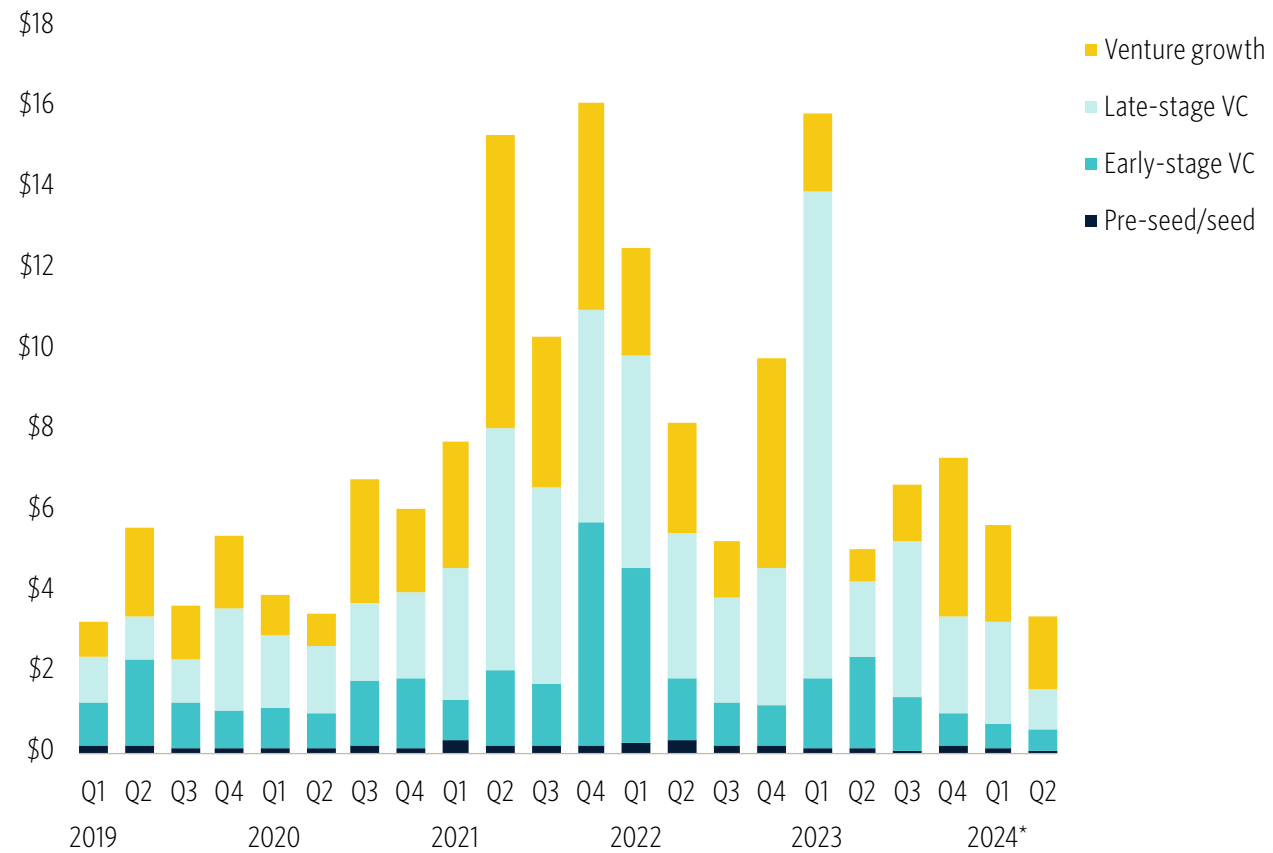


Source: PitchBook • Geography: Global • \*As of June 17, 2024



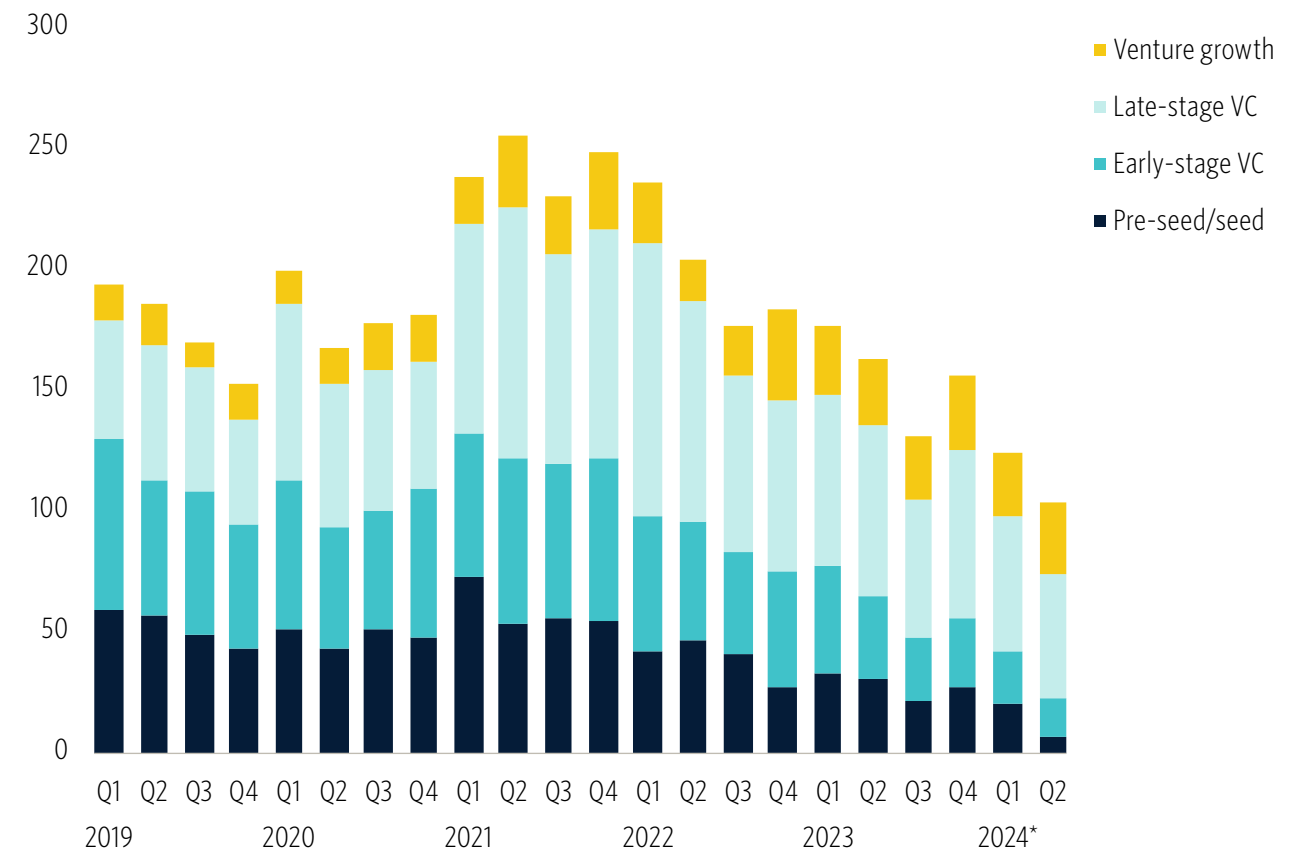
## VC ACTIVITY

### Quarterly defense tech VC deal value (\$B) by stage



Source: PitchBook • Geography: Global • \*As of June 17, 2024

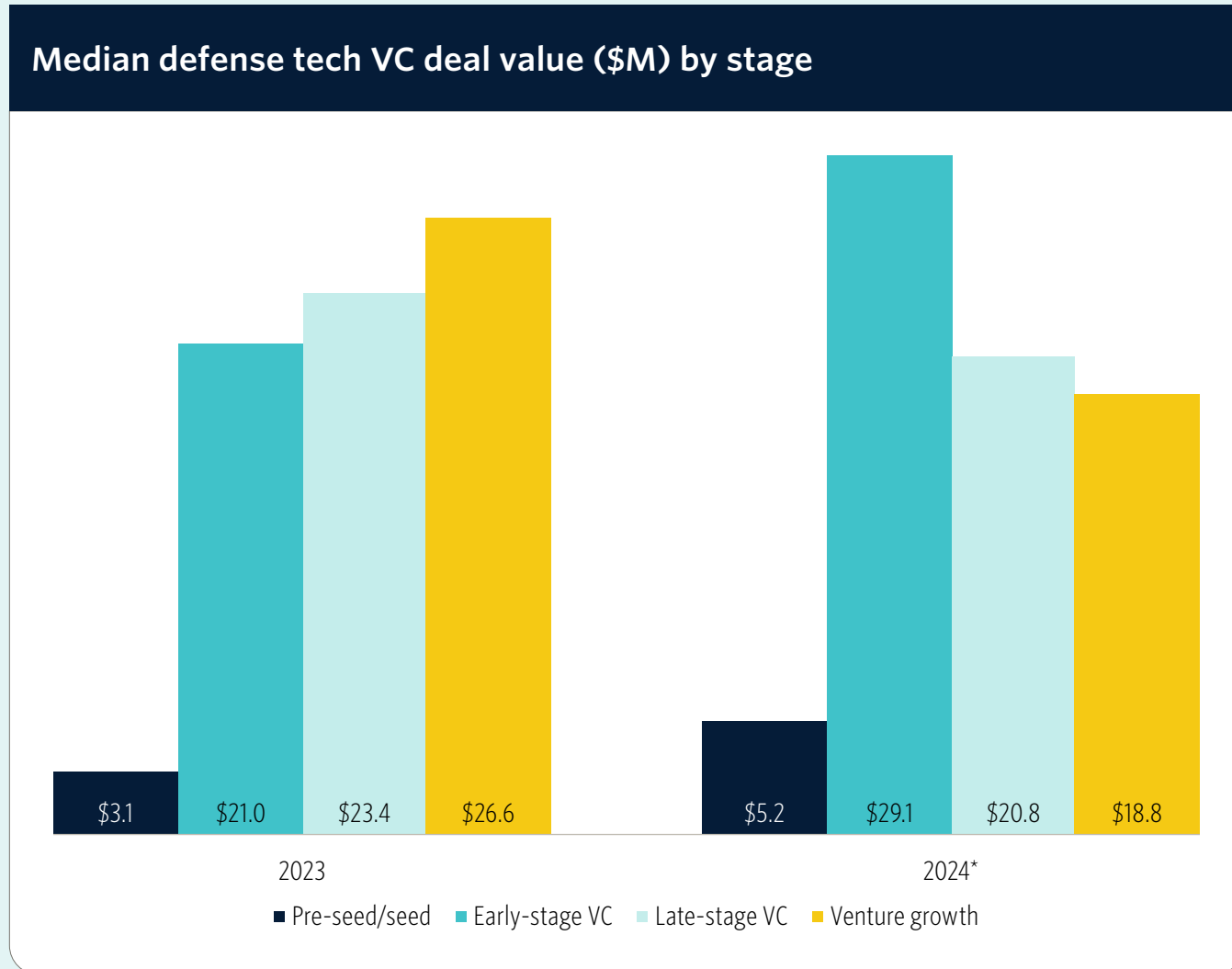
### Quarterly defense tech VC deal count by stage



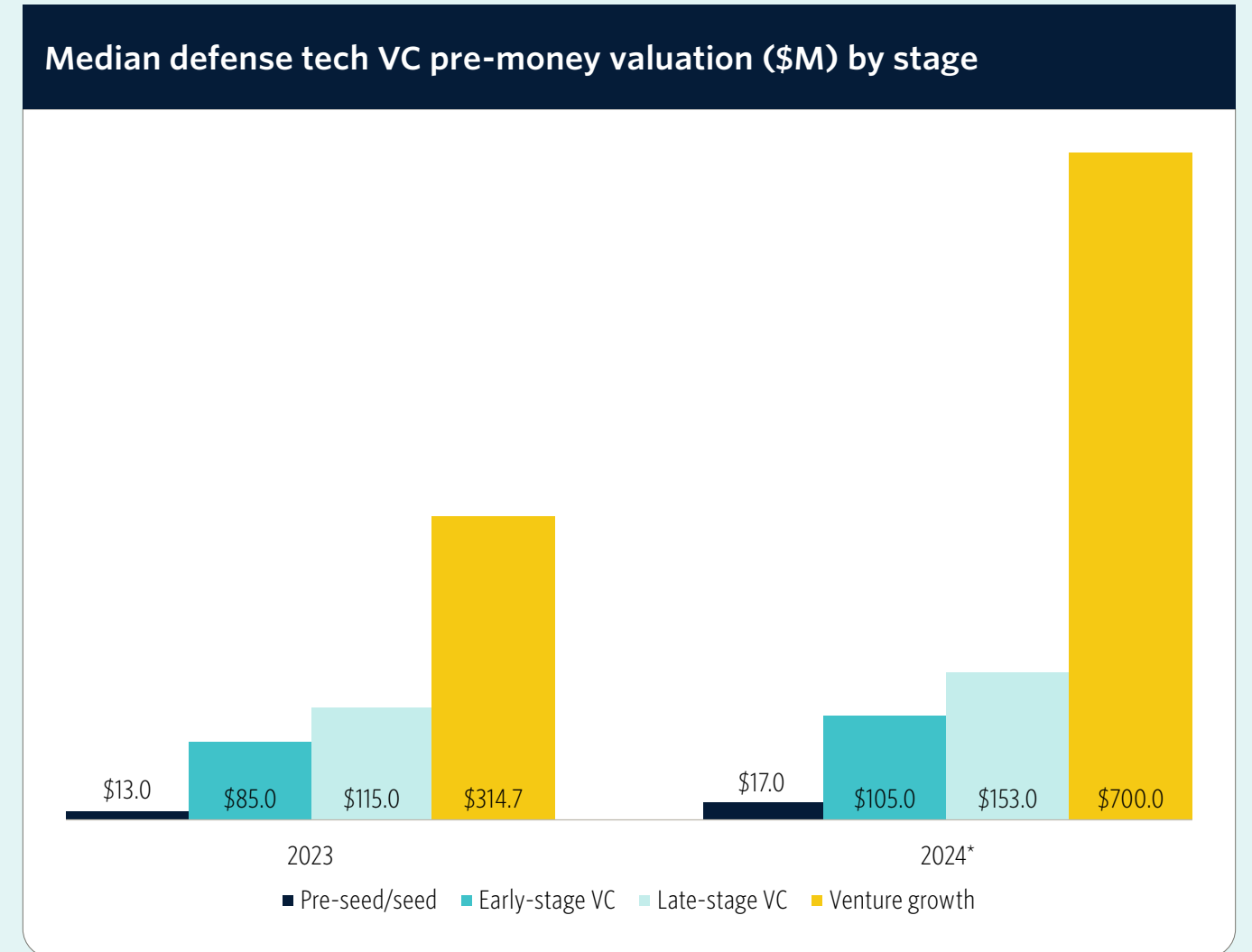
Source: PitchBook • Geography: Global • \*As of June 17, 2024



## VC ACTIVITY



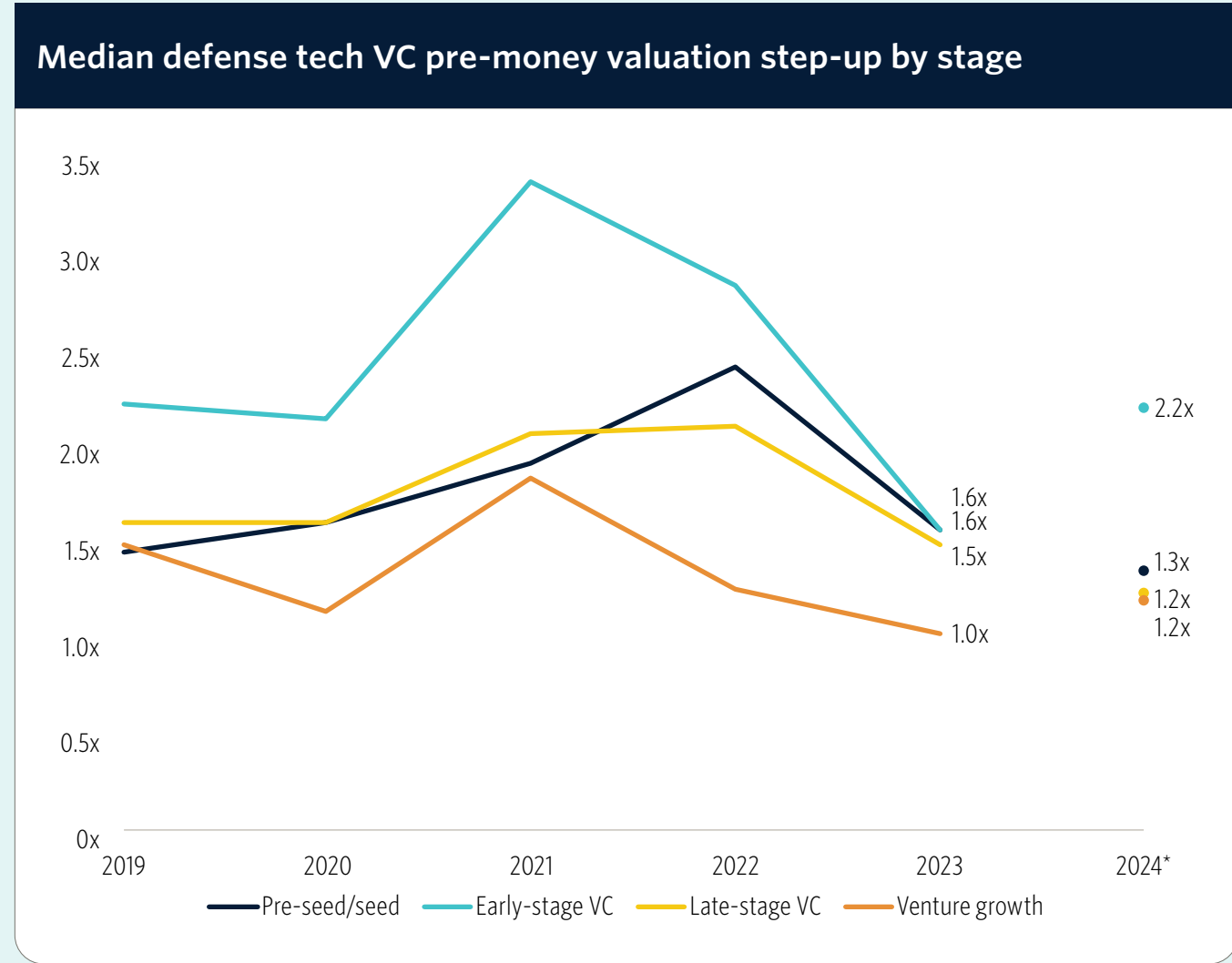
Source: PitchBook • Geography: Global • \*As of June 17, 2024



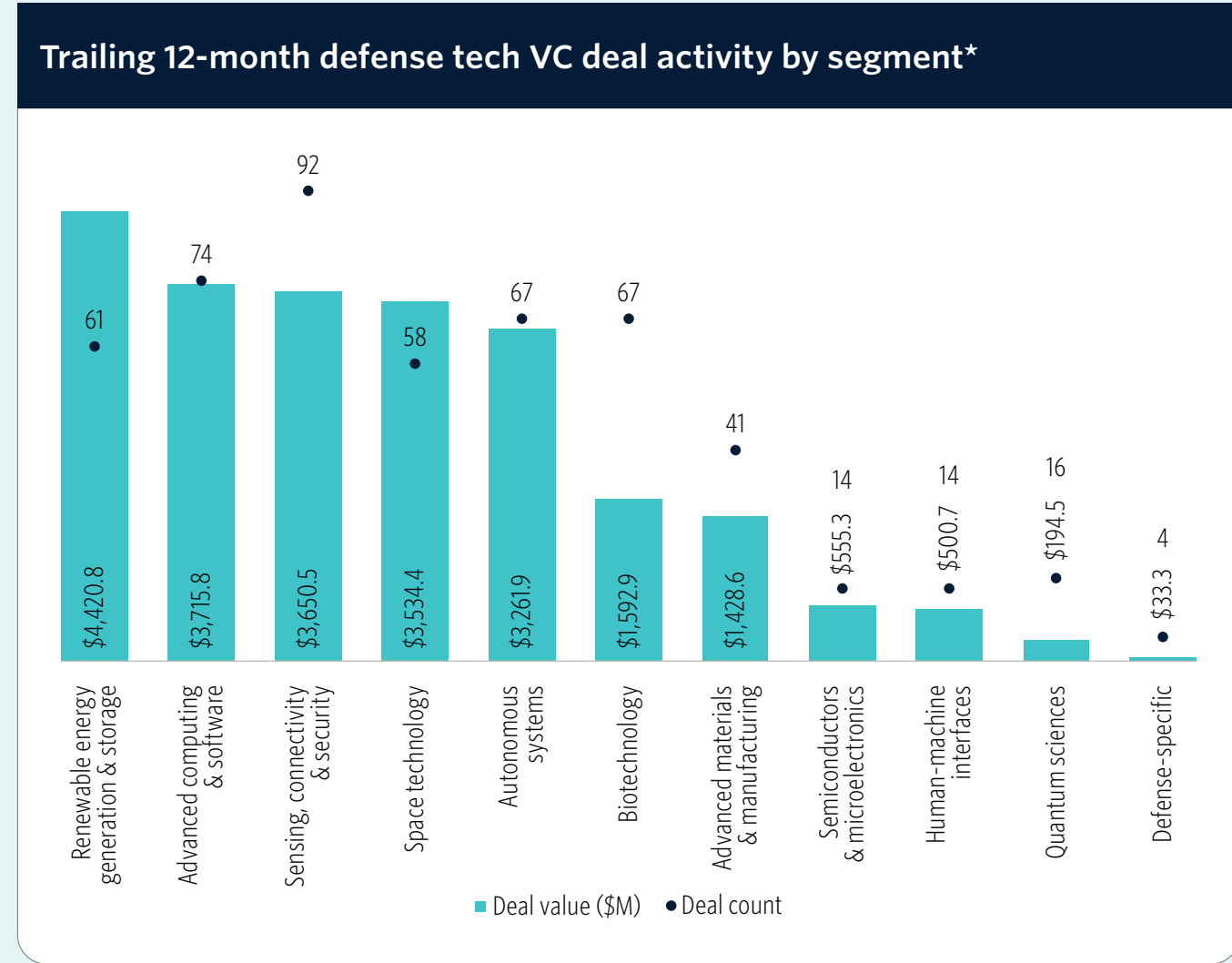
Source: PitchBook • Geography: Global • \*As of June 17, 2024



## VC ACTIVITY



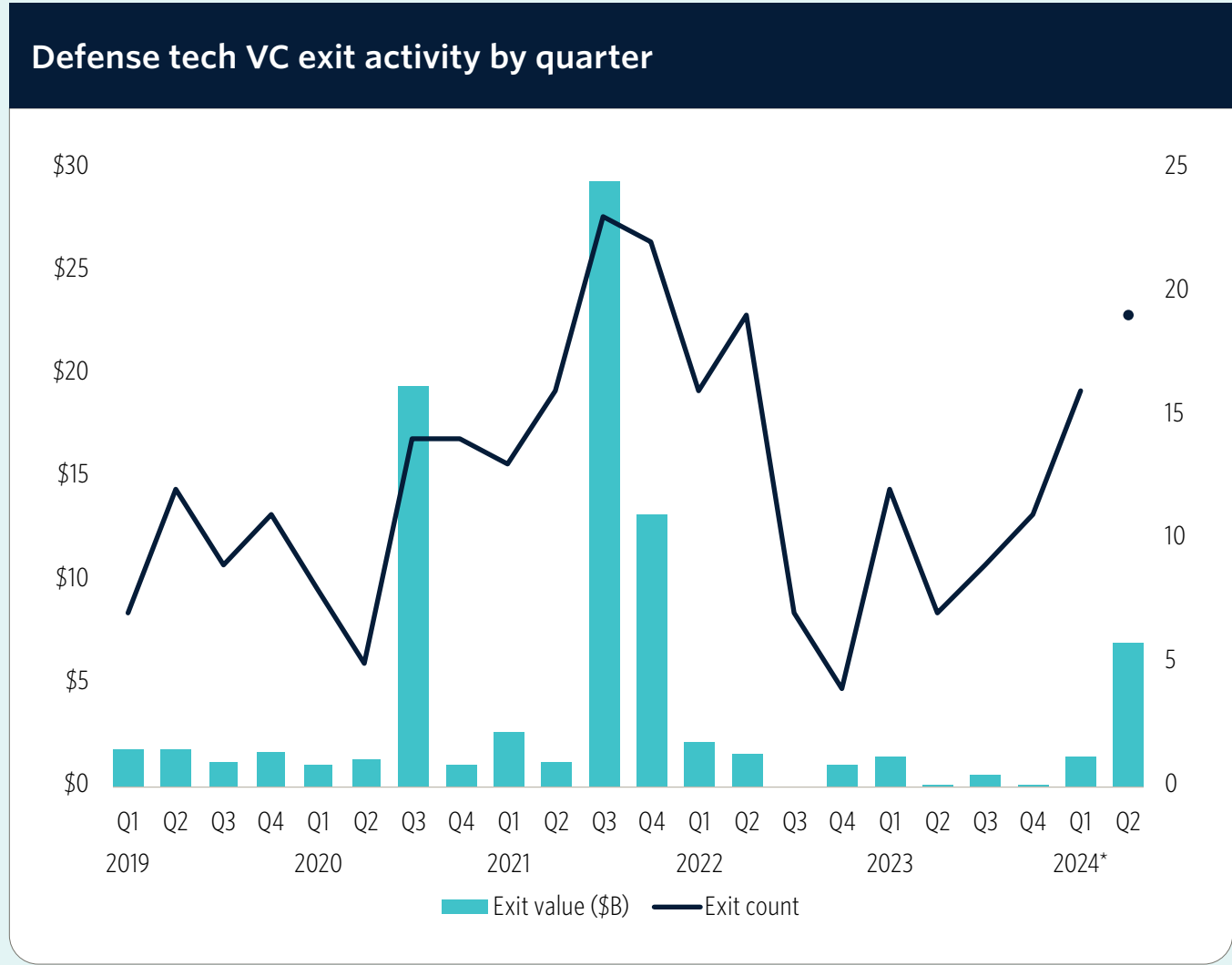
Source: PitchBook • Geography: Global • \*As of June 17, 2024



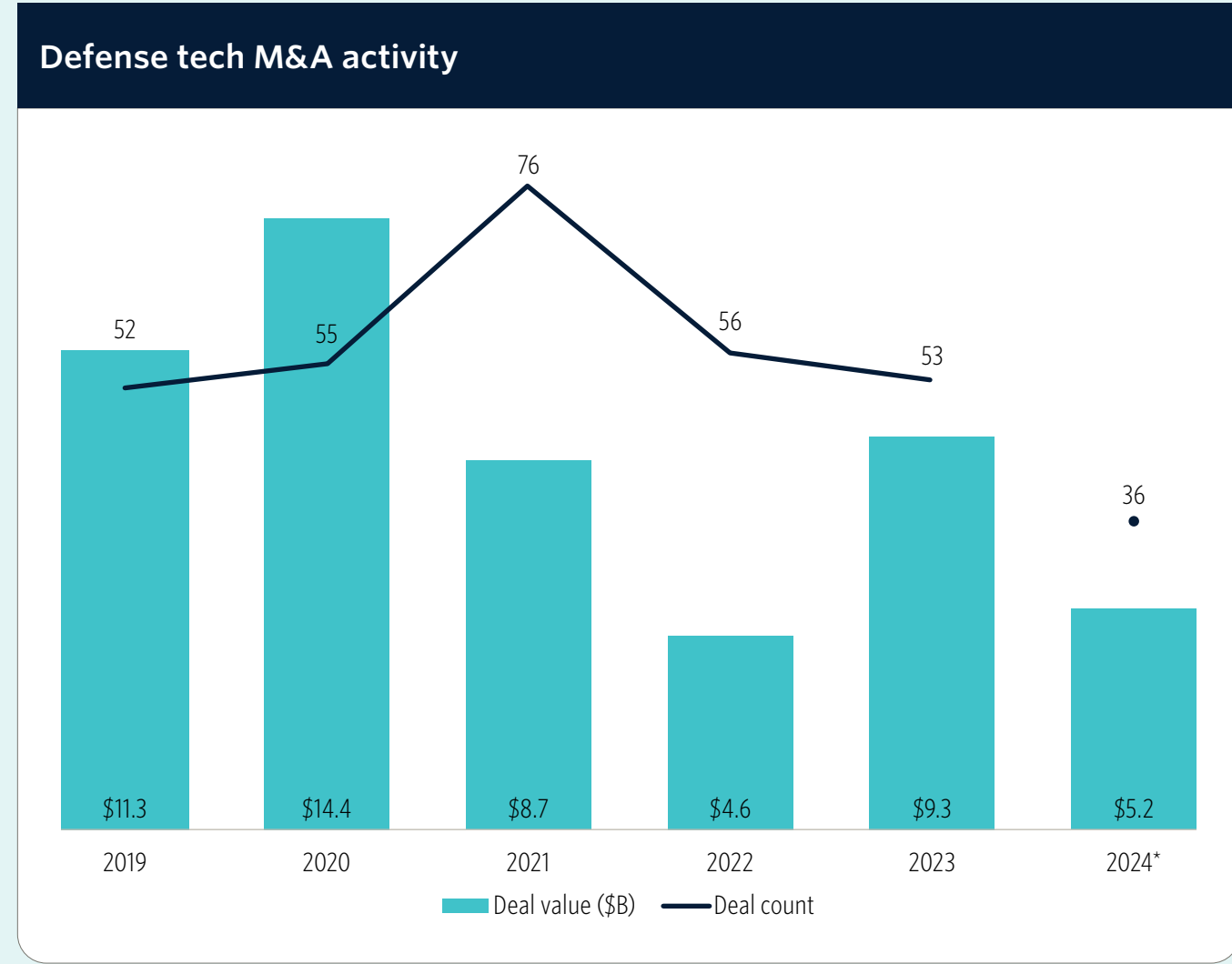
Source: PitchBook • Geography: Global • \*As of June 17, 2024



# VC ACTIVITY



Source: PitchBook • Geography: Global • \*As of June 17, 2024



Source: PitchBook • Geography: Global • \*As of June 17, 2024





# Key players

## Select defense contractor & system integrator deal activity\*

Defense contractor	Company	Segment	Category	Deal value	Deal type	Deal date
Lockheed Martin	Machina Labs	Advanced materials & manufacturing	Additive manufacturing & maintenance	\$31.2 million	Series B	October 4, 2023
Boeing	Skylo	Sensing, connectivity & security	Next-generation wireless networks	\$37.0 million	Series A	February 13, 2024
Raytheon	EnCharge AI	Advanced computing & software	Novel computing architectures	\$22.6 million	Series A	December 5, 2023
Northrop Grumman	Echodyne	Sensing, connectivity & security	Advanced sensors	\$135.0 million	Series C	June 13, 2022
General Dynamics	Medico Construction Equipment	N/A	N/A	N/A	M&A	June 15, 2020
BAE Systems	Reaction Engines	Space technology	Space launch, re-entry & navigation	\$48.7 million	Late-stage VC	January 23, 2023
L3Harris Technologies	Aerojet Rocketdyne	Space technology	Space launch, re-entry & navigation	\$4.7 billion	M&A	July 28, 2023
Leidos	HawkEye 360	Space technology	Satellite systems	\$150.0 million	Series D	November 8, 2021
Booz Allen Hamilton	Albedo	Space technology	Satellite systems	\$35.0 million	Series A	January 23, 2024
SAIC	Xage Security	Sensing, connectivity & security	Information security	\$20.0 million	Series B	November 2, 2023

Source: PitchBook • Geography: Global • \*As of June 17, 2024

Note: Northrop Grumman and General Dynamics have not made any new investments in the past year.



## KEY PLAYERS

### Top defense tech VC investors since 2022\*

Investor	Deal count	Pre-seed/seed	Early-stage VC	Late-stage VC	Venture growth	Investor type
In-Q-Tel	75	7	18	43	7	Not-for-profit VC
Andreessen Horowitz	62	6	25	19	12	VC
Alumni Ventures	52	8	16	25	3	VC
SOSV	46	23	5	17	1	VC
Lockheed Martin Ventures	37	5	7	22	3	CVC
8VC	37	5	14	16	2	VC
New Enterprise Associates	34	4	10	17	3	VC
Lux Capital	34	5	15	7	7	VC
Founders Fund	34	9	11	11	3	VC
Gaingels	28	5	10	11	2	VC

Source: PitchBook • Geography: Global • \*As of June 17, 2024



## KEY PLAYERS

### Top strategic acquirers of defense tech companies since 2022\*

Investor	Deal count	Investor type
Snowflake	4	Corporation
Cisco Systems	3	Corporation
Apple	3	Corporation
Allied Motion	2	Corporation
Anduril	2	VC-backed company
Ginkgo Bioworks	2	Corporation
Luminar	2	Corporation

Source: PitchBook • Geography: Global • \*As of June 17, 2024



# Key deals

## Key defense tech pre-seed and seed deals\*

Company	Close date	Segment	Category	Deal value (\$M)	Post-money valuation (\$M)	Lead investor(s)
<b>Unearthly Materials</b>	April 4, 2023	Semiconductors & microelectronics	Nanotechnology	\$17.0	N/A	N/A
<b>Atomic Industries</b>	December 4, 2023	Advanced materials & manufacturing	Additive manufacturing & maintenance	\$16.5	\$41.5	Narya
<b>Firestorm</b>	May 20, 2024	Autonomous systems	Unmanned aerial vehicles	\$15.0	N/A	Lockheed Martin Ventures
<b>Armada</b>	January 27, 2023	Advanced computing & software	Novel computing architectures	\$15.0	\$53.0	Founders Fund, Lux Capital, Shield Capital
<b>Castelion</b>	May 10, 2023	Defense-specific	Hypersonics	\$14.1	\$54.1	Andreessen Horowitz, Lavrock Ventures
<b>Apptronik</b>	February 7, 2023	Autonomous systems	Autonomous manufacturing	\$13.9	\$109.0	N/A
<b>Eden</b>	October 5, 2023	Renewable energy generation & storage	Alternative energy generation	\$12.6	\$32.6	Helmerich & Payne, TechEnergy Ventures
<b>Picogrid</b>	March 26, 2024	Autonomous systems	Defense systems integration & optimization	\$12.0	\$48.0	Initialized Capital Management
<b>Quintessent</b>	October 26, 2023	Semiconductors & microelectronics	Semiconductors	\$11.6	\$36.6	Osage University Partners
<b>Neros Technologies</b>	December 8, 2023	Autonomous systems	Defense systems integration & optimization	\$10.8	\$35.0	N/A

Source: PitchBook • Geography: Global • \*As of June 17, 2024



## KEY DEALS

### Key defense tech early-stage VC deals\*

Company	Close date	Segment	Category	Deal value (\$M)	Post-money valuation (\$M)	Lead investor(s)
<b>Inflection AI</b>	June 29, 2023	Advanced computing & software	Data management & analysis	\$1,300.0	\$4,000.0	Bill Gates, Eric Schmidt, Microsoft, NVIDIA, Reid Hoffman
<b>Adept</b>	February 23, 2023	Advanced computing & software	Data management & analysis	\$350.0	\$1,000.0	General Catalyst, Spark Capital
<b>Our Next Energy</b>	February 1, 2023	Renewable energy generation & storage	Advanced energy storage	\$300.0	\$1,200.0	Fifth Wall, Franklin Templeton
<b>Sierra Space</b>	September 26, 2023	Space technology	In-space services	\$290.0	\$5,300.0	Kanematsu, MUFG Bank, Tokio Marine Holdings
<b>Koloma</b>	February 9, 2024	Renewable energy generation & storage	Alternative energy generation	\$245.7	\$845.7	Khosla Ventures
<b>d-Matrix</b>	September 6, 2023	Advanced computing & software	Novel computing architectures	\$110.0	\$385.0	Temasek Holdings
<b>Stoke</b>	October 5, 2023	Space technology	Space launch, re-entry & navigation	\$100.0	\$380.0	In-Q-Tel, Industrious Ventures
<b>Celestial AI</b>	April 7, 2023	Advanced computing & software	Novel computing architectures	\$100.0	\$340.0	US Innovative Technology Fund, IAG Capital Partners, Koch Disruptive Technologies, Xora Innovation
<b>Hebbia</b>	May 14, 2024	Advanced computing & software	Data management & analysis	\$93.0	\$705.0	N/A
<b>Varda Space Industries</b>	April 5, 2024	Space technology	In-space services	\$90.0	N/A	Caffeinated Capital

Source: PitchBook • Geography: Global • \*As of June 17, 2024



## KEY DEALS

### Key defense tech late-stage VC deals\*

Company	Close date	Segment	Category	Deal value (\$M)	Post-money valuation (\$M)	Lead investor(s)
<b>Northvolt</b>	August 22, 2023	Renewable energy generation & storage	Advanced energy storage	\$1,200.0	N/A	N/A
<b>Ascend Elements</b>	February 20, 2024	Renewable energy generation & storage	Advanced energy storage	\$704.0	\$1,600.0	Decarbonization Partners, Qatar Investment Authority, Temasek Holdings
<b>Axiom Space</b>	August 21, 2023	Space technology	In-space services	\$460.0	\$2,500.0	AlJazira Capital, Boryung
<b>Electric Hydrogen</b>	July 25, 2023	Renewable energy generation & storage	Alternative energy generation	\$380.6	\$1,080.7	Energy Impact Partners, Fifth Wall, Fortescue Future Industries, Microsoft Climate Fund
<b>Neuralink</b>	November 22, 2023	Human-machine interfaces	Brain-computer interfaces	\$323.2	\$3,523.2	Founders Fund
<b>Lambda</b>	February 16, 2024	Autonomous systems	Defense systems integration & optimization	\$320.0	\$1,520.0	US Innovative Technology Fund
<b>OpenAI</b>	April 29, 2023	Advanced computing & software	Data management & analysis	\$300.0	\$29,000.0	Coatue Management
<b>Dragos</b>	September 18, 2023	Sensing, connectivity & security	Information security	\$274.0	\$1,774.0	BlackRock, Koch Disruptive Technologies, WestCap
<b>Boston Metal</b>	September 6, 2023	Advanced materials & manufacturing	Advanced armor & structural materials	\$262.0	\$860.0	ArcelorMittal
<b>Fervo Energy</b>	February 29, 2024	Renewable energy generation & storage	Alternative energy generation	\$244.0	\$640.0	Devon Energy

Source: PitchBook • Geography: Global • \*As of June 17, 2024



## KEY DEALS

### Key defense tech VC exits\*

Company	Close date	Segment	Category	Exit value (\$M)	Post-money valuation (\$M)	Exit type
<b>Rubrik</b>	April 25, 2024	Sensing, connectivity & security	Information security	\$4,877.9	\$5,629.9	Public listing
<b>Tabular</b>	June 4, 2024	Advanced computing & software	Data management & analysis	\$1,000.0	\$1,000.0	Acquisition
<b>Isovalent</b>	April 12, 2024	Sensing, connectivity & security	Information security	\$650.0	\$650.0	Acquisition
<b>Sayari</b>	January 17, 2024	Advanced computing & software	Data management & analysis	\$235.0	\$235.0	Buyout
<b>Laminar</b>	August 8, 2023	Sensing, connectivity & security	Information security	\$225.0	\$225.0	Acquisition
<b>Blackrock Neurotech</b>	April 29, 2024	Human-machine interfaces	Brain-computer interfaces	\$200.0	\$200.0	Buyout
<b>Mode</b>	July 19, 2023	Advanced computing & software	Data management & analysis	\$200.0	\$200.0	Acquisition
<b>Tomahawk Robotics</b>	September 15, 2023	Autonomous systems	Unmanned aerial vehicles	\$134.5	\$134.5	Acquisition
<b>Satelles</b>	April 2, 2024	Space technology	Satellite systems	\$115.0	\$115.0	Acquisition
<b>Ponder</b>	October 23, 2023	Advanced computing & software	Data management & analysis	\$46.0	\$46.0	Acquisition

Source: PitchBook • Geography: Global • \*As of June 17, 2024



# Recommended reading

- [“Shining a Light on the Defense Department’s Industrial Base Problems,” Texas National Security Review, Jeff Decker and Noah Sheinbaum, Winter 2023/2024.](#)
- [“FY25 Defense Budget Analysis,” Defense Tech and Acquisition, Pete Modigliani and Matt MacGregor, April 10, 2024.](#)
- [“PPBE Reform Commission Assessment,” Defense Tech and Acquisition, Matt MacGregor and Pete Modigliani, March 18, 2024.](#)
- [“FY23 Year in Review,” National Security Innovation Network, May 2, 2024.](#)
- [“The Defense Innovation Unit FY 2023 Annual Report,” US Department of Defense, n.d., accessed June 17, 2024.](#)
- [“Investment Strategy for the Office of Strategic Capital: Fiscal Year 2024,” US Department of Defense, March 8, 2024.](#)



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Our Industry and Technology Research provides detailed analysis of nascent tech sectors so you can better navigate the changing markets you operate in—and pursue new opportunities with confidence.

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