



White paper  
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# Who will fund the next innovation wave in European Defence Technologies?

January 2023

New York - London - Paris

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# Who will fund the next innovation wave in European Defence Technologies?

Geopolitical tensions, political interferences, reputational risks, perceived customer concentration and opacity of Business-to-Government (“B2G”) go-to-market: investing in the European defence tech industry is not for the faint-hearted.

With war now back at the gates of Europe, it is becoming increasingly clear that Europe has let strategic competitors gain key asymmetrical advantages in technological warfare; the need for innovation is pressing! It is not surprising that last September, the Center for European Policy Analysis urged public policymakers to leverage the brain power of their startup ecosystem to spur emerging and disruptive technologies<sup>1</sup>; however, who will fund this gap? In our series, we wanted to approach this problematic via the lens of a traditional Venture Capital investor, understand generalist & not defence-focused.

While the area hasn't yet been fully explored so far to the spotlight, we decided to study (first) and meet (second) with an onslaught of start-ups and stakeholders. Here are our key findings, notably highlighting what we called the "traditional VC challenges" and how do we perceive them at AVP:

Traditional VC challenges	How do we perceive them at AVP?
“Cyclical TAM capped by state’s budget”	Strong tailwinds, massive TAM, ability to create a multi-billion company with less than 5% mkt share
“Extreme client concentration”	Long-term visibility and no churn
“Time-consuming certification and (limited) access to data”	Once granted, strong barrier to entry
“(Unproven) ability to sell licenses to EU governments”	Early signs of evangelization as a result of rising collaboration between startups and governments
“B2G GTM is opaque”	Barrier to entry. At scale-up level, companies typically managed to navigate through the administrative labyrinth

## Selling to governments: controversial? the apex of client concentration?

*“There are some in our industry who view serving such agencies and missions as controversial. We do not. Regardless of our individual political beliefs, we all benefit from the work of the men and women in these agencies and the danger in which they put themselves daily. The least we can do is work to give back by building technologies that help them accomplish their missions more effectively and more safely.”* Marc Andreessen at a16z summed it all in 2019 when he led his investment in Anduril, nothing to add, really.

<sup>1</sup> CEPA, “Elevating our: a path to integrating emerging disruptive technologies”, September 2022

In the US, defence and intelligence agencies are heavily fragmented, the opposite tends to happen in Europe where they are more centralized: the State usually ends up being the only payer in town. Extreme customer concentration is commonly perceived as a risk when valuing startups, but doing so in the case of B2G misses the true value of contracting with defence departments. It may be hard to get them onboard, but once they are in, they never churn. And while B2G contracting is not easily linkable to traditional SaaS metrics such as LTV, they grant unmatched long-term visibility to investors, and as more use cases are developed upsell is often guaranteed. Lastly, while the growth of the TAM is capped by the State's budget, it remains so gigantic that a multi-billion company can be built with less than 5% of market share.

### **Intellectual property and access to data**

Traditional B2B SaaS investors and the military have different sets of expectations regarding software. Rather than paying on a recurring basis for licensed products, defence departments would rather acquire the entirety of the software all at once for obvious budget and security reasons. But as the CEPA's points out, *"intellectual property is the only profitable asset start-ups can claim"*. We are confident that in the future government will find innovative ways to lease intellectual property. As a matter of fact, the recent Tornade contract awarded by the French MoD to Preligens marked the first time - to the best of our knowledge - that a European government accepted to pay for a licensed defence software.

While software and AI will be two of the great next value unlocks in defence<sup>2</sup>, they raise the ever-thorny question of data sharing with private contractors. Why should defence departments entrust 3-year-old companies with some of their most sensitive data? While this compels start-ups to train their algorithms with commercial data, effectively gaining the trust of the military constitutes a robust barrier to entry. Defence departments are far from being the most loquacious business partners, so being able to see around corners and predict their needs and use cases is auspicious.

### **Opacity of B2G go-to-market**

In the current regulatory environment, each defence start-up knows that it is dependent on a stage perhaps more critical than its technological proof of concept. It is the ability to win the trust of the military, and to navigate the labyrinth of administrative procedures to secure sought-after government contracts. This brings us to the paradox of defence innovation: while speed is determinant in technological competition, the military is historically more risk averse, which is incompatible with the rapid innovation cycles of venture capital. This puts start-ups at a disadvantage against large contractors that have the knowledge, experience, and funds to navigate the lengthy and complex procedures (at least the outside-in perception) of government contracting. On the other hand, we recognize this as a strong barrier to entry in the event of success. At scale-up level, DefTech firms typically worked their way out of the maze, have a low risk of bankruptcy, and few competitors. On the latter, we expect this will be a winner take most market with 2-3 scaled players taking 65-70% of the market.

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<sup>2</sup> UK MoD "Defence artificial intelligence strategy", June 2022

What about treating directly with large contractors? The indirect approach comes with its own set of risks, mainly a strong dependency on private actors and a weak bargaining position in case of acquisition. In this sense, we welcome the CEPA's recommendation to develop more agile government contracting models. Beyond expanding opportunities for innovative companies, this would multiply the amount and frequency of defence VC funding by providing investors with more visibility on go-to-market.

Look out for our next piece, where we will be taking a deeper look at the landscape, highlighting some of the most innovative companies we met during the year.

## Mapping the software Defence Technologies ecosystem

Since we began investigating the DefTech industry, we have had countless conversations with founders, investors, and professionals from the US, Europe and Israel. We soon discovered that finding a comprehensive infographic, particularly one with a software-heavy approach and European emphasis, was difficult.

So, here is ours; below are the categories and most innovative companies we identified/met:










1. Geospatial & Signals intelligence
2. Physical threat detection
3. Digital media analytics
4. Situational awareness & Combat management system
5. Communication & Virtual training
6. Decision intelligence & Predictive maintenance
7. Threat intelligence










Before this post is met with potential commentary about mis-categorization or omissions, a few disclaimers should be noted:




- Our mapping is led by our investment thesis, with a focus on software-heavy companies. Still, a few hybrid or hardware-heavy players have been included in our list e.g. Anduril (we felt it was intellectually wrong to exclude the most funded company in DefTech), or Lambda Automata (where hardware — an autonomous surveillance tower — will be the enabler to a future software solution)
- Companies have been categorized according to their core defence-related activity, although it should be acknowledged that no mapping is bound to be perfect as the categories are not completely hermetic. For example, Accrete (included in bucket 7) also performs social media intelligence (bucket 3)
- We deliberately excluded cybersecurity as (i) extensively covered by fellow colleagues and (ii) we felt it would obfuscate the mapping. However, there are few exceptions such as Shift5, which has been included for its data protection solutions of weapon systems
- Company stages and funding rounds have been sourced from the traditional VC databases (PitchBook and Crunchbase) as of December 2022, with unspecified rounds being decided upon by us




Be sure to check out our final piece, in which we will delve into the challenges associated with VC-backed DefTech exits, specifically focusing on the topical concerns surrounding sovereignty and ESG.













Geospatial & signals intelligence Monitoring of strategic assets and locations				
Firm	Founded	Stage	Total raised	HQ Location
 PRECISIONHAWK	2010	Series D	\$140m	United States
 LEO LABS	2016	Series B	\$93m	United States
 perceptual	2017	Series C	\$92m	United States
 PERCEPTO	2014	Series B	\$64m	Israel
 aerospacelab	2017	Series B	\$62m	Belgium
 PRELIGENIS	2016	Series A	\$27m	France
 TERRAGO	2005	Series C	\$22m	United States
 blackshark.ai	2019	Series A	\$20m	Austria
 Geollect	2017	na	na	United Kingdom




Physical threat detection Detection of weapons, drones, and behaviors				
Firm	Founded	Stage	Total raised	HQ Location
 ANDURIL	2017	Series E	\$2.3b	United States
 OOSTO	2015	Series C	\$379m	Israel
 SHIFT5	2018	Series B	\$73m	United States
 ID-FEND	2017	Series B	\$35m	Israel
 ZEREEYES	2018	Series A	\$26m	United States
 actuate	2019	Series A	\$10m	United States
 actuate	2018	Series A	\$10m	United States
 AUTOMATA	2015	Series A	na	United States
 AUTOMATA	2021	Seed	na	Greece




Digital media analytics Modelling bots and influence networks				
Firm	Founded	Stage	Total raised	HQ Location
 BLOOM	2008	Series A	\$13m	France
 Cyabra	2017	Series A	\$13m	Israel
 GRIFFEYE	2015	na	na	Sweden

Situational awareness & combat management system Sensor fusion to augment command and control				
Firm	Founded	Stage	Total raised	HQ Location
 rebellion	2019	Series B	\$224m	United States
 Hobling	2021	Series A	\$120m	Germany
 EDGYBEES	2016	Series A	\$20m	United States

Communication & virtual training Next-gen troop support				
Firm	Founded	Stage	Total raised	HQ Location
 IMPROBABLE	2012	Series B	\$865m	United Kingdom
 element	2017	Series C	\$51m	United Kingdom
 6	2017	Series A	\$40m	United States
 ADYTON	2019	Series A	\$16m	United States
 Olvid	2019	Seed	\$2m	France

Decision intelligence & predictive maintenance Optimisation of processes and organisation				
Firm	Founded	Stage	Total raised	HQ Location
 sparkcognition	2013	Series D	\$310m	United States
 faculty	2014	Series D	\$54m	United Kingdom
 mind FOUNDRY	2016	Series A	\$50m	United Kingdom
 adarga	2015	Series A	\$26m	United Kingdom
 falconry	2012	Series A	\$14m	United States

Threat intelligence Identification and analysis of online threats				
Firm	Founded	Stage	Total raised	HQ Location
 CHAPSVISION	2019	Series A	\$100m	France
 RIPJARR	2021	Series C	\$75m	United Kingdom
 digital shadows	2011	Acq.	\$58m	United States

Threat intelligence Identification and analysis of online threats				
Firm	Founded	Stage	Total raised	HQ Location
 TOKA	2018	Series B	\$40m	Israel
 accrete	2017	Series B	\$30m	United States
 FNA	2013	Series A	\$10m	United Kingdom

# The challenges of exiting Defence Technologies

In our first piece, we discussed the “traditional VC challenges” associated with European DefTech investments. We chose to leave the exit topic aside, as we felt it requires a more comprehensive analysis. Not lying, the outlook may seem opaque at first; however, our work in this area, combined with early positive signs discussed below, leads us to believe that things are moving in the right direction.

## Selling EU DefTech companies: navigating between sovereignty and value maximization

Exhibit 1: M&A transactions (above €1bn EV) in Europe and North America

Date announced	Buyer		Target		Company description	Est. Price (€m)	Prior year sales (€m)
	Name	Location	Name	Location			
<b>North American acquirer</b>							
Sep-21	Vertex Aerospace	US	Raytheon Training & Solutions	US	Defence training and mission critical solutions (mostly aviation related)	n.a.	c. 1000
Jul-21	Huntington Ingalls Industries	US	Alion Science and Technology	US	Defence services / electronic products	1 650	1 600
Mar-21	Veritas / Evergreen Coast	US	Cubic Corp	US	Defence elec. (43% of sales); ground transportation systems (57% of sales)	3 000	1 476
Mar-21	CAE	Canada	L3Harris' Military Training Unit	US	Training and simulation across multiple domains	1 050	500
Feb-21	Eaton	US	Cobham Mission Systems	US / UK	Air-to-air refuelling systems, environmental systems, and actuation	2 830	n.a.
Jan-21	Teledyne	US	FLIR	US	Digital imaging equipment (c. 42% of sales from defence in 2019A)	8 000	1 892
Dec-20	Lockheed Martin	US	Aerojet Rocketdyne	US	Propulsion/energetic systems for space and missiles/armaments	4 400	2 062
Dec-20	Veritas Capital	US	NG's Fet IT & Mission svcs unit	US	Cybersecurity / data analytics / cloud / engineering svcs to defence other custs	3 400	2 300
Nov-20	Translign	US	Cobham Aero Connectivity	UK / US	Antenna and radios	965	225
Dec-19	Leidos	US	Dynetics	US	Applied research, services and solutions for the US DoD / govt agencies	1 650	c. 1000
Jul-19	Advent International	US	Cobham	UK	Defence electronics; defence systems; civil aero/marine/space products	4 931	2 565
Jun-19	United Technologies	US	Raytheon	US	Defence electronics; missile systems	Merger creating co. with A&D sales of \$73.6bn	
Oct-18	Harris Corp	US	L3 Technologies	US	Defence electronics	Merger creating co. with defence sales of \$16bn	
Sep-18	SAIC	US	Engility	US	Systems engineering for the defence, federal and intel communities	2 250	1 917
Feb-18	General Dynamics	US	CSRA	US	IT services (63% defence and intel; 37% health and civil)	9 600	5 178
Sep-17	Northrop Grumman	US	Orbital ATK	US	Space (launchers, satellites); missiles and armaments; aerostructures	9 200	4 625
Jul-17	Carlyle	US	Prasidiad	UK	Defence, perimeter protection and security systems	637	354
Jan-16	Leidos	US	L. Martin govt IT business	US	IT infrastructure/services; facilities M&O/logistics (60% civil, 40% defence/intel)	5 000	5 596
Jul-15	Lockheed Martin	US	Sikorsky	US	Helicopter prime manufacturer	7 100	7 451
Feb-15	Harris Corp	US	Exelis	US	Defence electronics	4 750	3 277
Apr-14	Orbital Sciences	US	Alliant Techsystems	US	Stock-for-stock merger (launcher/satellites, weapons, aerostructures)	c. 5000	n.a.
<b>European acquirer</b>							
Nov-22	Rheinmetall	Germany	Expal Systems	Spain	Weapon systems and munitions for defence and security	1 049	n.a.
Apr-21	Leonard-Finmeccanica	Italy	Hensoldt (25%)	Germany	Military sensors, electronic warfare, avionics and optronics	527	229
Sep-20	Hensoldt	Germany	Hensoldt	Germany	Military sensors, electronic warfare, avionics and optronics	€2.1bn Deutsche Börse IPO	
Jan-20	BAE Systems	UK	Rockwell Collins GPS business	US	Defence electronics (GPS receiver solutions)	1 560	332
Jan-17	Safran	France	Zodiac Aerospace	France	Aerospace equipment and systems	7 194	4 496
Mar-16	KKR	EU	Hensoldt	Germany	Military sensors, electronic warfare, avionics and optronics	1 210	1 100
Jul-15	Nexter Systems	France	Krauss-Maffei Wegmann	Germany	Weapons manufacturer	Merger creating co. with sales of €2bn	

Source: J.P. Morgan equity research (2022); MergerMarket; Company information; Press

Examining the past 10 years mega-deals (above €1bn EV) in Defence brings about some interesting conclusions, notably for future DefTech exits.

Starting with the challenges (from an European standpoint), it appears clear that deal activity is and will remain dominated by US strategic buyers for obvious reasons: bigger TAM, strategics with deep pockets, lack of cohesive defence strategy in EU, public markets being more receptive to mega-deals...the list is long. Additionally trans-Atlantic acquisitions are rare, unidirectional (US-to-UK, largely due to the history between the two countries), and highly scrutinized by regulators due to the fear sought-after technologies pass into foreign hands. Therefore, as a VC investor, is banking on US strategic buyers the most suitable central exit scenario? Probably not.

Our French background reminds us of the recent Photonis case. The company, which specializes in photo-sensor imaging and night-vision technologies, is a true French military gem. In December 2020, the French State vetoed its purchase by the US Teledyne, likely due to

protection of sovereign interests, and what we suspect was a lack of clear and ongoing communication among all stakeholders (including the French government). This resulted into a loss of value for the exiting investors, as HLD (French's private equity) final offer ended up being a third lower than the €510m initially offered by Teledyne. Does this mean that we cannot count on EU strategic buyers for our exit scenario either? The answer to this question is likely to be more nuanced.

(Un)ability from EU strategics to write multi-billion checks to acquire, fast-growth but still break-even, DefTech companies will, in our view, remain a challenge as they end up trading on an EBITA, not revenues basis. However, when it comes to navigating the sovereign topics within the European Union, there is some cause for optimism: the German Rheinmetall acquired the Spanish Expal Systems in November 2022, and Leonardo (Italy) took a 25% participation in Hensoldt (Germany) in April 2021, considered as a very "hot" sell-side auction in Defence.

Are there any alternatives to relying solely on the five or so strategic buyers from the EU? In the absence of a liquid public market (today) for European DefTech companies, we believe Private Equity will play an instrumental role in the development of the industry. Ukraine's invasion, abundant dry power and strong re-rating of defence stocks have stimulated the interest of investors and their lenders. We don't see this renewed interest as an opportunistic one, as the definition of "defence assets" has broadened and there is an increasing number of dual-use applications.

### **IPO'ing EU DefTech companies: ESG, the "elephant in the room"?**

No tables are needed to analyse the Defence IPO landscape in Europe.

According to our research, Hensoldt's IPO in 2020 was the most recent since EADS (now Airbus) in 2000. I was lucky enough to participate in the construction of this success while I worked at JPMorgan – we supported KKR with its acquisition in 2016 until the 2020 listing. Today, Hensoldt has been a great success and there have been few similar successful IPOs since 2020. While external factors (macro tailwinds and scarcity of defence assets) and the intrinsic quality of the company played a massive role, the efforts of KKR should not be overlooked. As an investor, I want to remember that their hard work in fostering an ongoing and transparent dialogue with the German government was essential to this success!

On the positive side of the balance, US DefTech players such as Palantir or Planet (exposed to both civil and defence) will have a longer history of being listed and experiencing various market cycles. Anduril will also be listed when the IPO window opens again, providing an important reference for future DefTech IPOs.

Concluding this series of paper with the words of the Latvian deputy prime minister: "is national defence not ethical?". In investor terms, are defence companies now ESG-compliant? "[While] this has long been a no-no for full-on ESG funds. It's also been a bit of a no for most funds with a bit of an ESG overlay [...] but it isn't so simple" (Financial Times, March 2022). Today, the bias against defence stocks is not as clear cut as one would think.



For instance, Thales, Rheinmetall and BAE Systems have good ESG ratings while 6% of Hensoldt free float is currently held by ESG funds.<sup>3</sup> Restrictions are mainly focused on specific products such as biological or chemical weapons rather than the sector as a whole.

Lastly, we are welcoming SEB IM's decision to update their sustainability policy and allow for investment in defence again<sup>4</sup>. Is this signalling a tectonic shift in the investor community? An investor survey from Deutsche Bank (2022) showed that 15% of North American investors still think defence should be excluded from ESG investments, while it jumps up to 57% in Europe! We believe European policymakers should take the lead in creating a more inclusive ESG environment.

<sup>3</sup> J.P. Morgan, « ESG Considerations », November 2022

<sup>4</sup> SEB, « SEB Investment Management updates the sustainability policy for investments in the defence industry », March 2022

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