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INTERVIEW WITH PROF. DR. MAURO GILLI

Professor of Military Strategy and Technology at the Hertie School

Deterrence Through Industrial Reinforcement

How does Europe's defence-industrial base compare to Russia's war economy, and what must Europe change to sustain high-intensity war and credibly support Ukraine as US backing wanes? Industrial capacity, mobilised at scale and able to adapt legacy systems, matters more than cutting-edge tech in attritional war; Russia currently does this better than Europe. Europe should rebuild mass production, cut its dependence on China, and unify procurement to deter Russia.

From Mines to Missiles

How can Europe strengthen its position in the field of rare-earth elements (REEs)?Onshoring, allied shoring, and nearshoring, underpinned by suitable EU-level mechanisms, are best conceptualised not as rival strategies but as complementary and mutually reinforcing tools. Europe's dependence on REEs supply chains constitutes a vulnerability that necessitates a sustained and pragmatic effort to reduce dependency in order to safeguard its defence credibility and industrial resilience.

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Role and Impact: As BDLI's Managing Director, she represents 260+ companies in the German aerospace sector, which employs 115,000 people and generates €46 billion annually. Strategic Pillars: BDLI focuses on civil aviation, military aviation, and space, driving innovation in climate-neutral tech and defense. Future Growth: The industry faces high demand due to defense backlogs and the commercialization of space.

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Hybrid security regimes are not symptoms of institutional weakness but deliberate political strategies. Hybrid security regimes are used to enhance flexibility and extend the reach of state-aligned coercive practices. In hybrid security regimes, sovereignty is seemingly exercised not only through formal hierarchies but through shifting, relational, and often opaque networks of authority

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Theodor Himmel connects students with experts in diplomatic and economic affairs. Together with his colleagues, he built EPIS Think Tank into one of the largest student-led think tanks in Europe and also initiated the EPIS Network. He currently serves as Chairman of EPIS. Alongside this, after completing an LL.M. at Leiden University, he is finalizing his legal training as a law clerk at the Regional Court of Baden-Baden. Currently, he works as a consultant in a Munich-based family office.



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Editorial



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Europe needs to focus on defence enabled research and development to strengthen the military industrial complex.

Dear Reader,

Europe is in the process of the most consequential security transformation since the end of the Cold War. The full-scale Russian invasion of Ukraine has evolved into a war of attrition that merges new technological developments with war-fighting tactics from the First World War. The conflict in Ukraine pits two markedly different industrial systems against each other. The West has decreased its manufacturing capacity after the Cold War to focus on the manufacturing of a small number of high-tech systems. Russia, on the other hand, continues to follow the Soviet model of valuing large quantities of material over quality. Which of these systems will ultimately endure cannot be determined at this time.

What is clear, however, is that Europe needs to expand its defence industrial base and adapt to the dynamics of high-intensity conflict to build credible deterrence in the face of waning U.S. support. This report analyses the opportunities and challenges that arise from such a profound reform of the defence-industrial base, ranging from critical inputs, such as rare earth elements, to financial constraints.

In the first section of the report, Xerxes Hafezi Rachti, Alba Gremli Torres and Patryk Borowski analyse current capability gaps in the European defence-industrial base. In the second part, Jolina-Zoe Zarda and Julia Konarzewska discuss current initiatives that define the development of European defence. Finally, in the third section, Karolina Kisiel, Denisa Cepoiu, and Radosław Binkiewicz discuss topics such as private military contractors, rare-earth supply, and decoupled industrial structures that could influence the future of the defence-industrial complex.

The report is completed with guest contributions from Mauro Gilli, professor of Military Strategy and Technology at the Hertie School and Dr. Özlem Has, independent researcher and former post-doc researcher at King's College London.

I want to thank the authors and the EPIS board for their dedicated work and excellent collaboration during the drafting of this report. I also want to thank our guest writers for contributing to this student-led report on security policy and defence and for supporting our goal of increasing the impact of young voices in European security debates.

We hope that you will enjoy the read!

Felix Heuner
EPIS Report Groups
Group Leader



About the Article

How does Europe's defence-industrial base compare to Russia's war economy, and what must Europe change to sustain high-intensity war and credibly support Ukraine as US backing wanes? Industrial capacity, mobilised at scale and able to adapt legacy systems, matters more than cutting-edge tech in attritional war; Russia currently does this better than Europe. Europe should rebuild mass production, cut its dependence on China, and unify procurement to deter Russia.

About the Author

Xerxes Hafezi Rachti is currently enrolled at the Hertie School, studying International Affairs with a focus on International Security. At the University of Mannheim, he attained a multidisciplinary bachelor's degree in English and American Studies and Business. His research focuses on technological innovation, strategic competition, and military operations.

1. Introduction

Since Russia invaded Ukraine in 2022, European leaders have begun to recognise that Europe needs to defend itself as US protection is no longer a guarantee and may become conditional. Increasing industrial capacity is essential for defending European values and maintaining peace, as industrial warfare has returned to Europe. At the centre of this effort lies the dormant European industrial complex. How does it compare to Russia's war economy, and what can Europe's defence industry do to enhance Europe as a credible defence actor? To provide an idea, this essay will assess the importance of the defence industry, characterise Russia's defence industry and highlight key differences with Europe's defence industry.

2. Defence Industry in Industrial Warfare

It is helpful to briefly examine the war in Ukraine and its industrial requirements for maintaining the war effort. Contrary to what Putin anticipated, the invasion swiftly evolved into a war of attrition, where both sides are equipped with military equipment of similar sophistication. In wars of attrition, the victor typically emerges due to a stronger industrial base, either by possessing the capacity to produce more ammunition or by rapidly converting existing civilian facilities for military purposes, rather than by having superior specialised technology (Vershinin, 2022). It is unlikely that Russia can deliver a decisive strike to European nations; however, further research is required to evaluate different scenarios. Regardless of whether Russia directly attacks Europe or maintains its war effort in Ukraine, assessing the European defence industry is useful to understand how Ukraine can be supported in a future where US support diminishes further. In any case, Europe will need to rely on US CI4SR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) capabilities, as Europe remains decades behind.

3. Russia's Defence Industry

3.1 Design, Ethos and Innovation

Russia's lack of world-leading high-tech innovation can be partly attributed to its political system and the specific cultural implications it entails. In the Soviet Union, there was a distinct focus on aerospace, the military, and nuclear innovation, which weakened civilian sectors. This period also saw the Soviet Union attempt to compete with Silicon Valley by leveraging its STEM-educated population in a satellite district of Moscow, Zelenograd. (Usdin, 2005). The goal was to build a worthy rival to the semiconductor and computing industry in California, which has clearly failed, as I am writing this essay on a MacBook and not a Bitblaze Titan BM15. Russia's inward focus after Vladimir Putin's 2012 reelection limited its ability to attract businesses and individuals who drive innovation at the technological frontier, leaving it without technologies as advanced as those in the West. Little market incentives, direct political control, low venture capital, and fear of failure in the top-down legacy are among the reasons why the Soviet Union failed to attract the most creative and ambitious people (Center & Bates, 2019). Several Soviet-era design demands and system-based limitations are shaping the Russian defence industry as it exists today. While there have been profound changes in requirements and constraints, such as the 1990 economic collapse, NATO expansion, and hybrid warfare in Georgia and Crimea, some crucial design tenets endure. Soviet military doctrine and its specific demands on weapons systems mean that mass production is inherent in the design of Russian military equipment today. The anticipation was that battles would be intense and prolonged, as they are in Ukraine today (Richard Ward, 1989). A particular understanding of military economic efficiency that accounts for the damage inflicted on enemy objects at an approved cost in material resources is crucial to understanding Soviet military design (Danylyuk, 2022). This was, and still is, partly influenced by the limitations of engineering and manufacturing capabilities in the Soviet Union and

Russia. At the edge of what was technically feasible, the Soviets nearly always attempted to replicate what the West was doing. However, even before World War II, the complexity of weapons systems increased exponentially, requiring absorptive capacities to compete in producing the most advanced weapon systems (Gilli & Gilli, 2019). Since the systems integration skills, tacit knowledge, and the industrial and scientific base were firmly established in the West, the USSR could never quite catch up, even when detailed blueprints for Western projects were stolen, as demonstrated by the Tu-144 and the Buran Programme (Redacted Author, 1984). Despite its obsolescence, the military legacy left by the USSR, comprising vast stockpiles of comparatively simple tanks, bombers, fighter jets, munitions, and unguided bombs, as well as the industrial capacity to produce and maintain them, has been repurposed to support the war effort in Ukraine. Armoured vehicle deliveries to the military are high to sustain attrition; however, of the roughly 1500 tanks delivered in 2023, only a fraction were new, while the rest were modernised older models taken out of storage (Evans, Gasparyan, Wolkov, Gibson, & Kagan, 2025). Other legacy systems, such as unguided bombs, are updated to deliver some degree of precision, offset by a heavier payload, making roughly hitting the target "good enough" (Danylyuk, 2022). Updating legacy equipment to meet modern requirements is, in part, enabled by the heritage present in many Russian systems, such as the many variants that followed the original Su-27. Low-cost, mass-produced Geran-2 loitering munitions, based on the Iranian Shahed system, have also been firmly integrated into the Russian military doctrine (Clark, 2025).

3.2 War Economy and Supply Chain Management

The Russian war economy is sustainable for now, but it is doubtful whether it can sustain itself much longer (Snegovaya, M. 2025). The invasion of Ukraine in 2022 lowered Russia's arms exports significantly. Sales began to dwindle during the pandemic in 2020 and have remained low since (George et al., n.d.) The high demand from the Russian military, which offset slowing external demand, led to growth, with 520'000 new jobs created since the start of the war, bringing the total to roughly 4.5 million. (Danylyuk, 2022). A new middle class has emerged, with defence wages multiple times higher than the average pay that members of disadvantaged communities previously received, reducing their interest in ending the war significantly (bne IntelliNews, 2025). Contracts with manufacturers are long-term, and companies have made significant investments in increased production by opening new facilities and modernising and extending existing ones (Danylyuk, 2022). Stockpiles do not last indefinitely, and Russia is not a fully autarchic economy in its wartime efforts, which is why China has become its most significant ally. Disrupting supply chains for basic raw materials in defence manufacturing would have a greater impact than disrupting those for specialised hardware like microchips. Up to 70 per cent of Ukrainian combat casualties have been attributed to artillery shelling (Epstein et al., 2023). Producing artillery munitions requires cotton pulp and cellulose nitrate, raw materials mainly imported from China, as well as machinery for processing cotton (Luzin, 2025). Efforts to produce cellulose nitrate from linen or hemp have so far been unsuccessful; thus, disrupting cotton imports to Russia presents a significant opportunity to weaken the Russian war economy. Europe's limited influence on the global cotton market makes this a largely theoretical possibility.

Imports of Cotton Cellulose (HS Code: 470610) To Russia – January 2020-March 2024)

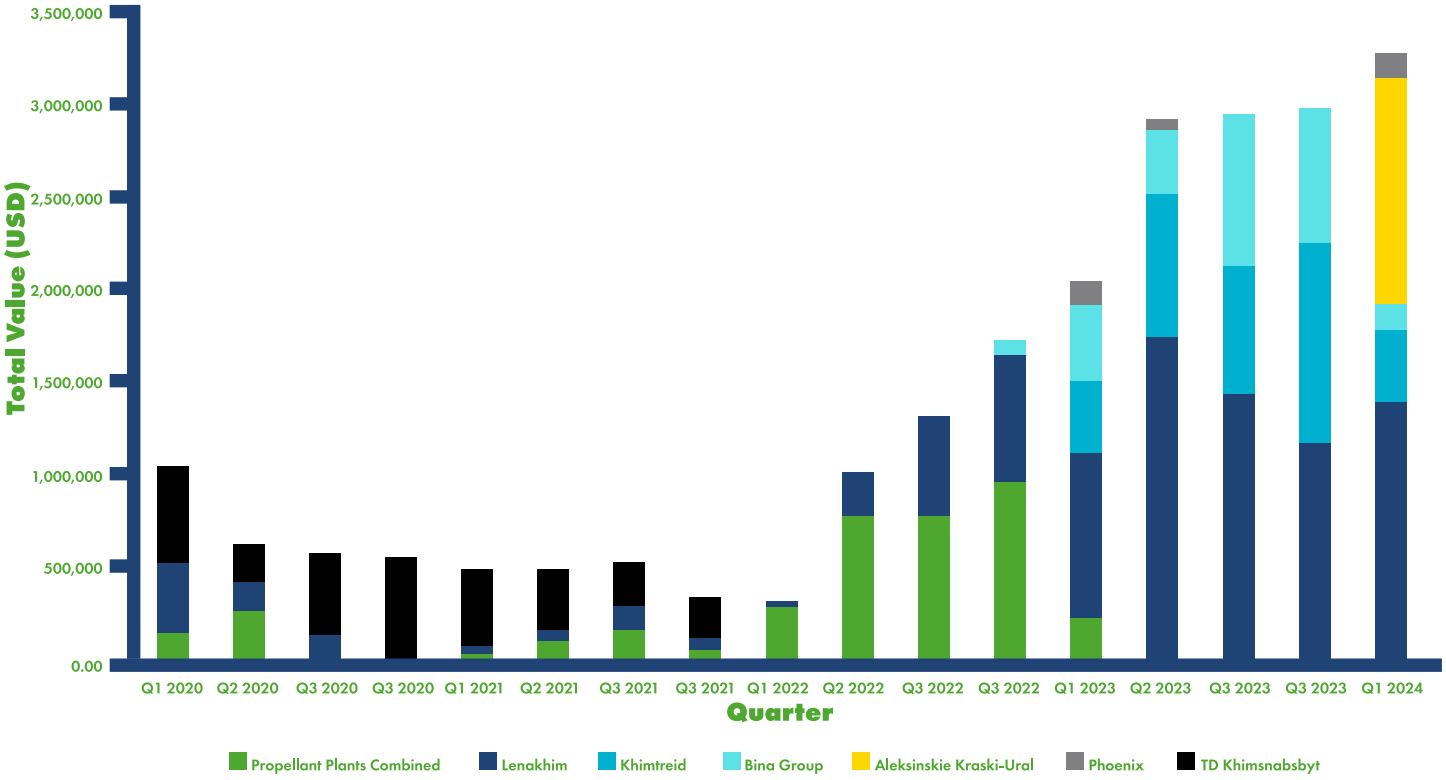

Figure 1: Russain Imports of Cotton Cellulose and Recipient Entities, Source: https://www.rusi.org/explore-our-research/publications/external-publications/ore-ordnance-disrupting-russias-artillery-supply-chains

Europe has more leverage over the companies that are the sole suppliers of high-precision machine tools used in rocket manufacturing. The lack of a firm commitment to strictly enforce export regulations allows Russian rocket production, which is central to its military doctrine, to survive (Galeev, K., et al., n.d.). A similar dependency on European machine tools exists in the Russian artillery supply chain (Borovikov et al., 2024).

3.3 *Europe*

Posen argued in 2006 that the newly formed European Union was "preparing itself to manage autonomously security problems on Europe's periphery and to have a voice in the settlement of more distant security issues, should they prove of interest." (p. 150) The final part is especially important because there was little recognition of Russian interests and their gravity after Crimea was annexed in 2014. When Russia began its invasion of Ukraine in 2022, Germany pledged to rapidly establish itself as the main pillar of conventional defence in Europe" (Danylyuk, 2022).

3.4 De-industrialisation and Rescaling

The innovation-driven European defence industry excels at high-end research and development. Still, it is currently unable to sustain a prolonged high-intensity conflict along a drawn-out front. Several factors have led to a decline in European industrial defence capabilities over the past 35 years. The peace dividend meant that European economies thrived while militaries were underfunded, and the industrial defence sectors shrank. Military missions were mainly carried out away from European borders and had different requirements compared to a war of attrition; the available funds were used for high-end manufacturing, though in small quantities. Most importantly, the culture and skilled workforce, along with their tacit knowledge for mass defence manufacturing, were lost — a problem that cannot be simply fixed by throwing money at it. Rheinmetall cannot simply approach Volkswagen and buy an entire production line, including personnel, to manufacture tanks or ammunition. Employees require specialised training and security clearances to handle explosives; warehouses must be certified and adapted to store

explosives; and robots that assembled the ID.3 this week cannot assemble a Leopard next week, to name just a few issues. New production lines are costly and take time to reach full capacity. Still, they are a necessary step, one that Rheinmetall has taken with their new plant in Unterlüss, Germany, which is planned to be fully operational in 2027 (Deutsche Welle, 2025). This challenge is not limited to Europe but also extends to the US, where artillery systems have received less attention in recent history due to the focus on precision-strike weapons (Hacker, 2023).

3.5 Fragmentation and Duplication

In addition to the fragmented ideas regarding Europe's posture, there is also fragmentation in defence systems. On the one hand, economies of scale cannot be realised, and path dependency hinders countries' ability to adapt swiftly. On the other hand, a broader range of systems may pose greater difficulties for Russia to adapt to. The inefficiencies start with Research and Development, where distrust hinders collaboration among EU members and results in small-scale production, preventing the take-up of economies of scale (European Parliament, Directorate General for Parliamentary Research Services, 2024). Resources are wasted through duplicated research and processes; some products even end up competing in foreign procurement programmes.

3.6 Supply Chain Management

Europe is also dependent on imports for defence manufacturing. These dependencies include, but are not limited to, rare earths, tungsten, and guncotton. The most relevant issue is the same one Russia faces: cellulose nitrate, a vital component of artillery-shell propellants (Hackett et al., n.d.). China, which is also Europe's main supplier, has in recent years "developed, tested, and deployed a new set of second-generation economic weapons [...] used more often and for a wider set of policy goals [...]"(Medeiros & Polk, 2025). Some of these dependencies that China can leverage today have existed for over 15 years, and control over rare earths and their processing—up to 98% in some cases—does not happen overnight; many opportunities have been missed.

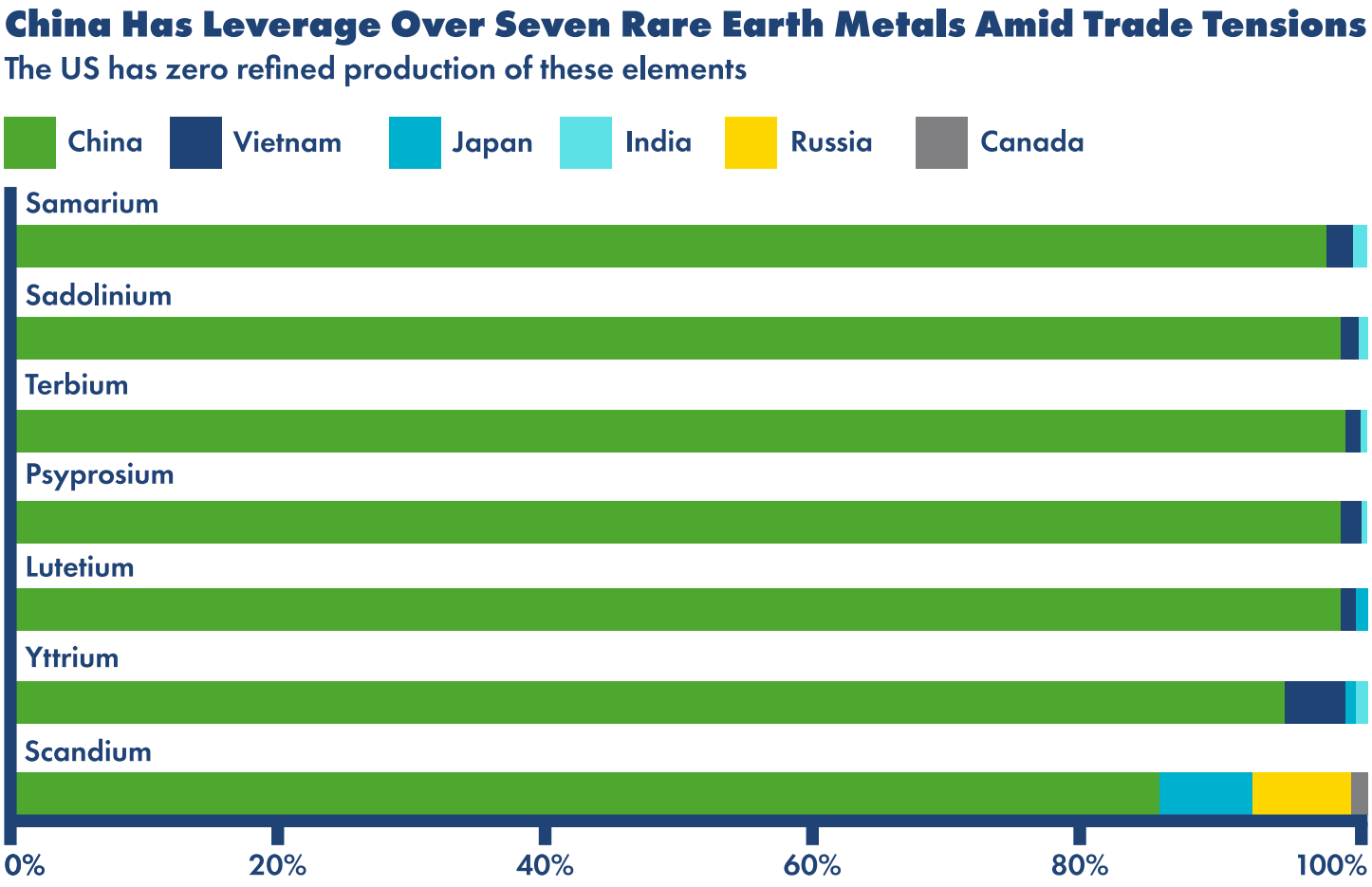

Figure 2: Country breakdown of global refined output, Source: https://www.msn.com/en-us/news/world/why-rare-earths-are-china-s-trump-card-in-trade-war-with-us/ar-AA1GzrBX

Besides its crushing monopoly over the refining of these seven rare earth elements, China accounts for over 90% of global refining (International Energy Agency, 2025). Without refinement, raw materials cannot be used in their final application. This means that although China has an abundance of rare earth elements, controlling one step in the value chain allows it to dominate the entire market. Institutionalisation of Procurement and Funding. The urgency of the matter might prompt changes in how troop and resource contributions within the EU have been planned for a long time. The main reason EU states have previously cooperated in security missions is through networked collaboration, where key states utilise dense institutional and social networks to negotiate, pressure, bargain, and persuade other states to participate (Henke, 2019). These security missions vary significantly in length, scale, and urgency, from a potential hot war with Russia, requiring solutions that focus more on the long term than on networked cooperation. A crucial step in this direction is the establishment of the ReArm Europe Plan/Readiness 2030, which aims to mobilise €800 billion in defence spending over four years through a combination of national fiscal flexibility, EU-backed loans, and redirected cohesion funds. This includes the €150 billion Security Action for Europe (SAFE) instrument, adopted by the EU Council in May 2025, which facilitates joint procurement in priority areas such as air and missile defence, drones, and cyber security, while ensuring at least 65% of production occurs within the EU, Norway, or Ukraine (European Commission, 2025). While there is significant innovation potential in European startups, economies of scale, cohesion, and availability require well-funded European solutions, such as those mentioned above, to enhance incentives for greater coherence in the Defence industry.

4. Conclusion

The war in Ukraine has highlighted the importance of industrial capacity, rather than technological sophistication alone, in high-intensity conflicts. Russia's ability to mobilise legacy systems, increase production, and maintain a war economy despite structural weaknesses starkly contrasts with Europe's fragmented and downsized defence industry. Years of underinvestment, deindustrialisation, and the loss of tacit manufacturing knowledge have left Europe poorly prepared for prolonged warfare or for supporting Ukraine without considerable external aid. At the same time, Europe must ensure that its engineering excellence is not used to produce Russian weapons further. To become a credible security actor, with or without US support, Europe must move beyond ad hoc or short-term mechanisms such as networked cooperation and instead establish long-term procurement, funding, and supply-chain strategies, as volatile markets are not the right environment for consistent defence industry funding. Rebuilding industrial capacity and securing critical inputs are essential steps towards restoring Europe's ability to deter aggression and sustain high-intensity operations. Ultimately, Europe's strategic credibility depends not only on advanced technology but also on managing supply chains and bottlenecks to enable large-scale and rapid production of defence materiel, as "the war in Ukraine has proven that the age of industrial warfare is still here" (Vershinin, n.d., p. 1).

Tacit Knowledge:
specialised, unwritten expertise and organisational experience gained through long-term practice and trial-and-error, which cannot be captured in blueprints or manuals. It is a critical component of absorptive capacity, acting as a „complexity barrier" that prevents adversaries from successfully replicating advanced technologies through espionage or reverse engineering alone.

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About the Article

How can the EU achieve strategic autonomy in defense amid technological disruption and geopolitical rivalry? Europe must adopt three interdependent policies: ethical governance for emerging technologies, industrial and supply chain resilience, and integrated cybersecurity to secure its defense ecosystem. By aligning these points through investment, collaboration, and unified standards, the EU can become a key player and increase its sovereignty.

About the Author

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1. Introduction

The twenty-first century has witnessed an unprecedented acceleration in technological innovation, fundamentally altering the nature of security, defence, and geopolitics. Across the European horizon, these changes reveal themselves through a stark reality: the existence of automated decision-making, the fragility of supply chains, the invisibility of cyber domains, and the geopolitical tensions emanating from distant theatres like Ukraine and the Indo-Pacific. Where once the conception of strategic autonomy settled for narrow definitions of military self-reliance, today the European Union and its member states are pressed to articulate a broader vision. This vision must no longer pivot solely around technology as an end in itself, nor around separate technologies like artificial intelligence, geotechnology, or cybersecurity. Instead, it must consolidate around concrete policy imperatives: how to govern innovation ethically, how to build resilient industrial foundations, how to integrate digital defence capabilities seamlessly, and how to cultivate a strategic culture that binds a diverse continent together. The narrative aims to shift debates away from a list of technologies and towards an articulation of clear policy recommendations. It begins by framing governance and ethics as the bedrock of a legitimate and credible strategy, then considers the resilience of the European industrial base, addresses the inseparability of cybersecurity from traditional defence, and finally highlights the necessity of forging a shared strategic imagination. In doing so, it embraces the complexity of the topic.

2. Governance and Ethical Frameworks

Governance and ethics must form the foundation of any strategy that seeks to harness emerging technologies for the purposes of defence and security while remaining true to the values for which Europe stands. The notion of strategic autonomy could become hollow if it were detached from ethical reflection; autonomy and power are meaningless if cast aside from democratic accountability, human rights and the rule of law. How do we ensure that decision-making processes respect human dignity and oversight? What institutional architecture is necessary to hold developers, procurers and military commanders to account when a semi-autonomous drone makes mistakes or lethal force is directed without human consent? These questions do not come with clear answers, but they are nonetheless asked and have to be answered. The European Union has confronted these questions through the codification of the AI Act and through the establishment of parliamentary committees dedicated to the subject of artificial intelligence in a digital age (European Parliament, 2022). By prioritising a human-centric, risk-based model, the EU sets itself apart from frameworks that valorise raw capability over respect for human rights. Yet the explicit exclusion of military applications from the AI Act exposes a vulnerability, placing strategic uses of algorithmic tools in a regulatory grey zone. The absence of rules for the battlefield allows for ambiguity to grow and ethical continuity to fracture. Accordingly, policymakers should extend the scope of regulation to address military contexts, devising standards for transparency and proportionality that apply irrespective of technology and landscape. Everyone from civil society activists to software engineers should sit at the table, their voices informing deliberative processes that yield binding codes of conduct. Europe could stand up an independent observatory monitoring the deployment of automated systems within the defence policy. Such a body might audit algorithms, review procurement choices, rule on objections, and publish sanitised reports summarising its activity. By doing so, it could balance the necessities of secrecy with the imperatives of accountability. Independent ethical advisory boards, commissioned by the Council, the European Parliament or even NATO, can review classified programs and publish the essential lessons to the public that are hesitant to accept anything less than openness. Within these frameworks, normative innovation can expand. Experience with the General Data Protection Regulation suggests that value-laden law can originate from a broad consensus

about human dignity and privacy (gdpr.eu, n.d.). The same consensus must extend to security: fairness, explicability, and contestability belong in the framework of defence as much as they do in the area of business. Algorithms reflect their creators, and they mirror unconscious biases rooted in gender, ethnicity and class. When translated into lethal or coercive contexts, those biases risk perpetuating injustice and worsening the universal quality of the underlying mission. Thus, policies requiring diverse design teams, mandating bias audits, and implementing corrective measures are not optional niceties; they are essential components of a moral and ethical regime. The EU could legislatively mandate that all advanced defence prototypes undergo independent bias testing prior to acquisition. Simultaneously, the practice of deliberative democracy should be extended into the security sphere. In a democratic landscape, citizen assemblies might be convened to weigh in on the use of autonomous weapons, framing the underlying debate as one about the kinds of societies we choose to build. Repeated review cycles would insulate policy from obsolescence, reflecting the accelerating pace of technological change and the emergence of unanticipated consequences. Revisitations would allow for frameworks and policies to be reviewed consistently, rather than once a crisis hits. Ethical reflection must remain supple enough to shape innovation rather than trailing behind it. Interrogating the relationship between emerging technologies and international humanitarian law is indispensable (Short, 2025). Do long-standing principles of distinction, proportionality and necessity retain their force when executors are algorithms or when attacks emanate from non-state actors that reject international conventions? The European approach should be anchored in the strongest possible commitment to human rights and to humanitarian ideals, integrating these norms into every stage of research, development, testing and deployment. Member states should embed obligations into their procurement contracts requiring respect for humanitarian law. Independent compliance officers could report directly to the European Court of Human Rights. Victims of algorithmic error must receive access to justice, redress and rehabilitation, channelled through impartial tribunals that command trust across cultural and national boundaries. The friction between secrecy and democratic legitimacy demands institutional innovation: parliamentary committees with high-level clearances can bridge the gap between elected representatives and technical experts. Transparency reports, released periodically with necessary redactions, can expose aggregate statistics about errors and anomalies, highlighting the flaws that lurk beyond public view (Short, 2025). Such openness empowers citizens to hold governments responsible without undermining operational security. Europe's normative power can be amplified through coalitions: coordinated dialogues with transatlantic partners, negotiations at the United Nations to enshrine norms against indiscriminate autonomous weapons, and coalitions of like-minded states can press adversaries to accept minimum standards (Sylvia, 2025 March). These are not idealistic fantasies but practical acts of leadership; the EU's influence on data protection law and climate regulation demonstrates that normative leadership can shape the entire landscape beyond its borders. Finally, institutional architectures must be redesigned to promote flexibility and responsiveness in the face of uncertainty: agile decision-making, networks of regulators and academics, and protocols that reflect public health emergency mechanisms could underpin an ethical regime capable of weathering storms. Sharing best practices through a European ethics repository lowers the cost of learning from mistakes and propagates high standards across the continent, something the EU has strived to do in other fields (European Parliament, 2022). Yet even in these laudable efforts, nuance is necessary. Ethics cannot be enforced like rules, as they change with time and place (Short, 2025). In practice, when

Dual-use innovation:
Technologies developed for civilian purposes that can also be applied in military or defense contexts. It bridges commercial and defense sectors (e.g., chips, batteries).

European states negotiate with allies whose own ethical compass differs from Europe's, reconciling differences becomes crucial. Dialogue with partners beyond the Union must be predicated on respect, as ethical partnerships should be born out of mutual self-understanding beyond formal treaties. Scholars and regulators from different parts of the world should work together to probe the underside of innovation: cross-disciplinary research could explore not only the promise of technologies but their hidden toll on social cohesion, privacy and political legitimacy. Continuous training for judges, lawyers and soldiers about the philosophical underpinnings of autonomy and dignity can prevent situations where those tasked with combat remain ignorant of the ethical standards they are obliged to uphold. This would strengthen the international rule of thumb and build a more cohesive policy landscape on the ethical use of technology. The answers to the previously asked questions cannot be rhetorical. In the end, ethical governance is crucial to hold European and international autonomy together, and without it, any growth built on technology alone collapses into fragmentation and unethical competition.

> **"Building the European Defense Technological and Industrial Base, investing in dual-use innovation, and diversifying supply chains will secure Europe's technological sovereignty and economic strength."**

3. Industrial and Supply Chain Resilience

Resilience at an industrial level stands as the second pillar in the project of European strategic autonomy. The vulnerabilities exposed by the Covid-19 pandemic, by supply-chain disruptions coming from tensions with China and by the attack of Ukraine demonstrate that Europe's dependence on foreign sources for critical inputs leaves its sovereignty fragile (Sylvia, 2025). The chips that sustain our communication networks, the batteries that mobilise vehicles, the specialised rare earth minerals that constitute sensors, and the processors that enable complex analytical tasks are barely manufactured within the borders of Europe (Israel, 2025).

The framework of resilience requires an economic policy that pivots towards both sufficiency and innovation, rejecting monopolies but recognising that diversification, stockpiling, reshoring, and the creation of strategic industrial clusters are pragmatic hedges against coercion. A strategy of industrial resilience starts by mapping dependencies, pursuing transparency along the value chains and quantifying risks rather than pretending that market forces alone will provide for European security. The European Chips Act (European Commission, 2022) and the Critical Raw Materials Act (European Commission, 2023) mark important first steps, signalling the world's will to invest in domestic production and to develop capacities across the upstream segments of critical industries. But such initiatives demand long-term commitment beyond reactive announcements. The European Defence Fund's budgetary envelope for 2021–2027 represents one of the few institutional vehicles for joint investment in borderline technologies, but it must be scaled upward and complemented by incentives that encourage private capital to grow into defence-relevant R&D. Moreover, public-private partnerships (PPPs) must be encouraged to accelerate innovation. A cohesion among government, business, and research units should be institutionalised and entrusted with concrete goals like inventing, manufacturing, and ultimately distributing into the markets. The dual-use nature of many strategic goods offers opportunities for economies of scale, but only if the partnership between civilian and military sectors is unified. Additionally, procurement policies should highlight modular architectures that can be adapted for civilian markets and vice versa. The European Defence Technological and Industrial Base can flourish only if it is in partnership with commercial ambitions and strategic long-term goals (European External Action Service, 2022). Lastly, a coherent industrial strategy should also address sustainability and climate interdependencies, understanding that future steel manufacturers, chip plants, and AI data centres will be both harmful to the environment and can also be sources of

resilience and key components in a sustainable economy. For industrial resilience, the areas of technological leadership, diversification, and environmental stewardship should come together to build a strong industrial policy that brings together these areas in a way that its resilience lies not in single industries but in the whole network. This could also come with the downside of the industries being overly dependent; however, with the right policy framework, this can be mitigated. Resilience is embedded in understanding risk to mitigate and assess future risks. Thus, it is important to be risk-averse and watch out for bureaucratic obstacles and one-sided interests that can hinder innovation and leave the continent to be a follower rather than a leader. To hinder this, concrete roadmaps with monthly or yearly goals and agreed budgets must be set in place. Geopolitically, Europe must navigate between superpowers, like the U.S. and China, through reciprocal partnerships that let capital and technology flow into the continent (Parisini, 2025). Trade agreements and investment screening can help steer Europe in the right direction. To embed a unified plan, a concrete framework of specialisation should be prioritised. Member states should focus on their capabilities, whether that's quantum photonics or green munition technologies (Csernatoni, 2024). By focusing on each nation's strength, Europe can increase its resilience together through collaboration rather than individual strategies. Institutions such as the European Investment Bank and national development agencies should prioritise projects that connect this plan into cohesive networks underwritten by a shared vision of the common good and goal.



Figure 1: Relationship of the EU regarding rare earths and raw Materials

Complementary to ethics, economic resilience compels us to question the architecture of supply networks. For example, the extraction of rare earth metals often occurs in nations with lax environmental standards. Europe cannot achieve resilience at the expense of human rights or sustainable goals that aren't present in other continents. Therefore, policy must bind ethics and sustainability into resilience strategies. This could take the form of binding due diligence laws that require companies to report on every upstream tier of their supply chains. Moreover, financing instruments like green bonds can be tied to defence projects on the condition that the entire supply chain complies with environmental and labour norms. At the same time, small and medium enterprises (SMEs) should be woven into the industrial policy. On that note, regional incubators, matched funding schemes, and capacity-building programmes enable SMEs to contribute meaningfully to national security, embedding resilience within communities across Europe (European Commission, 2025). This also highlights infrastructure rebuilding, which offers another canvas for resilience. Rather than merely rebuilding war-torn infrastructure like bridges or tunnels, with the right policies, they can be transformed into sensors and actuators within a smart defence grid that monitors the flow of goods, anticipates disruptions, and dynamically reroutes shipments. Building resilience from the start ultimately diminishes cost and effort at the end.

4. Integrated Cyber and Digital Defence

Cybersecurity integration comprises the third policy imperative, recognising that the digital environment is one

of the principal domains of twenty-first-century coercion and confrontation. Cyberspace has evolved into a fifth domain alongside land, sea, air, and space. The fragmentation of national cyber policies across Europe, the uneven distribution of capabilities, and the absence of a common threat picture translate into windows of opportunity for those who would inflict harm and put the continent at a disadvantage. A unified European cybersecurity posture must be more than an alignment of technical standards; rather, it must embody a cultural reorientation that appreciates the interdependence of all critical functions that European countries have to offer (Csernatoni, 2025 May). Cybersecurity cannot be delegated to a handful of specialists but should rather be highlighted centrally in all decision-making, procurement, training and operations. The NIS2 Directive and the Cybersecurity Strategy chart legal contours for Europe's digital defence, but implementation cannot be enacted without unified political will (European Parliament, & Council of the European Union, 2022). The military sphere is frequently overlooked despite being especially exposed. Integrated command and control systems, battlefield sensors, and even basic logistics rely upon networks that are targets for disruptions. Thus, Europe must invest in the human capital necessary to detect, prevent, and respond to cyber threats. Moreover, the cultivation of a skilled cyber workforce demands early education and lifelong training. For that, cyber ranges, simulation centres, and updated education systems should be expanded across the continent and should be complemented by credentials recognised by all countries and tied to career progression in national militaries and civilian administrations. Additionally, information sharing should expand beyond rhetorical commitments. Interoperable platforms and the development of trust allow countries to work together and build a unified European system. Establishing common incident response protocols, joint exercises, and rapid-reaction cyber units contributes to an emergent collective European cyber identity (European External Action Service, 2022). This also includes data protection, which overlaps with cybersecurity. The GDPR, when suitably interpreted, can guide the ethical collection of threat intelligence and secure the depot that underpins analytical campaigns. Additionally, a shared vocabulary of cyber concepts could be created and constantly updated to reflect the pace of innovation. Moreover, a common certification scheme for components, software and services would raise the baseline of resilience and create a market premium for security-by-design. Interconnection in cyberspace remains notoriously difficult, as devising mechanisms to gather credible evidence for state-sponsored attacks without compromising civil liberties becomes, in many ways, a national matter.

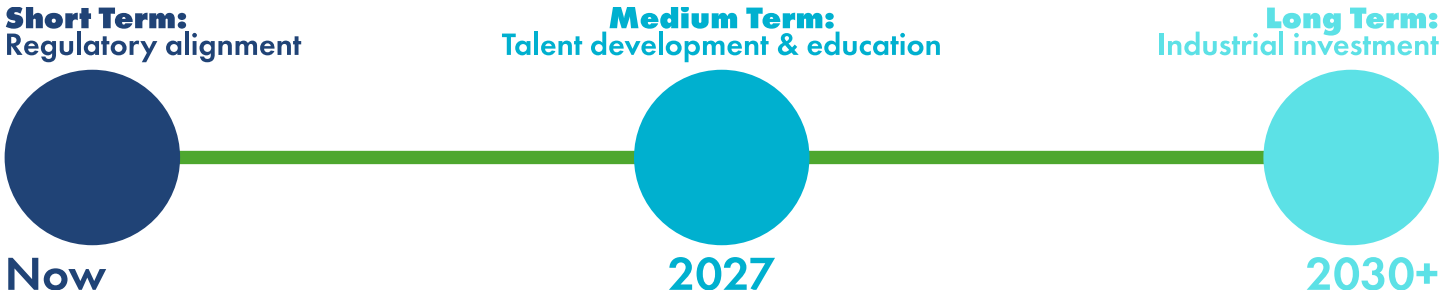

Figure 2: European Strategic Autonomy – Key Steps

5. Conclusions

Europe's pursuit of strategic autonomy in defence is no longer aspirational; it is an urgent necessity shaped by technological disruption, geopolitical rivalry, and hybrid threats. Three policy imperatives stand out as decisive for the future. First, ethical governance and oversight must anchor innovation, ensuring that artificial intelligence and emerging technologies align with democratic values and international law. Without robust standards and accountability, autonomy risks becoming hollow power. Second, industrial and supply chain resilience is critical to reduce dependency on external actors. Building the European Defence Technological and Industrial Base, investing in

dual-use innovation, and diversifying supply chains will secure Europe's technological sovereignty and economic strength. Third, integrated cybersecurity must become a core defence pillar, with harmonised standards, skilled workforce development, and rapid-response capabilities to counter escalating digital threats. These priorities are interdependent: governance shapes trust, resilience underpins capability, and cybersecurity ensures continuity. By committing to these policies with sustained investment and coordination, the EU can transform fragmentation into unity and vulnerability into strength. Strategic autonomy is not a static goal but a dynamic process—one that demands vision, collaboration, and unwavering resolve to safeguard Europe's security and values in an increasingly contested world.

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About the Article

Why is traditional warfare not enough in countering hybrid threats? Traditional warfare is an insufficient tool in dissuading and countering the hybrid threats, and in the case of its usage, there appear to be blind spots and a lack of the desired effect. Countering hybrid threats requires an integrated approach of traditional military means and non-military, non-kinetic ones (economic, cyber, law, etc.).

About the Author

Patryk Borowski holds an MA in International Relations (Security & Strategic Studies) from the University of Warsaw. His interests include German and Austrian foreign, security and domestic policy; the nexus of international economics and defence planning; East Asian security; and Caucasus politics. He gained initial experience in international banking, linking global financial dynamics with international affairs.

1. Introduction

Recent and prospective increases in defence expenditure invite scrutiny of whether these investments are aligned with the character of the threat they are meant to counter. This essay maintains that prioritising the development and procurement of traditional armaments, such as tanks, field guns and howitzers, alone, is no longer sufficient against Russia, given the fusion of hybrid methods with transformed forms of conventional warfare. Although it continues to play a vital role in symmetrical traditional conflicts of this kind (Calcagno & Marrone, 2024), this study examines the limits of traditional force-centric responses. It identifies multi-domain strategies and capabilities that can more effectively deter and respond within this integrated security landscape. Among NATO members, some introduced measures, which seem to be in theory more effective in countering Russian actions, such as Finland and Sweden with their 'total defence' approach. These measures, however, are regularly tested, and in terms of the complexity of the actions taken, there appear to be blind spots. This article adopts an empirical approach, using a case study of the defence and foreign policies of Eastern Flank NATO members. It is organised into three parts. First, it defines the threat by outlining traditional and hybrid warfare, identifying the relevant actors, and delimiting the geographic scope. Second, drawing on the theoretical framework of hybrid attacks, the case study assesses current and potential countermeasures, considering their operational and financial effectiveness. Third, it synthesises the findings to derive policy implications.

2. Conceptual framework

When writing about the Russian hybrid attacks against NATO, it is impossible not to mention Russia's invasion of Ukraine and the relationship between these two processes. One is what Ukraine is currently experiencing, and that is traditional war, which has broken out as a consequence of the Russian invasion in 2022. The second is hybrid warfare, or, more generally, actions that can be grouped under the term "hybrid threats". In this chapter, I aim to dispel doubts and clarify the meanings of the terms mentioned and their roles in the rapidly evolving European security architecture.

2.1 Traditional warfare

Traditional warfare has historically been symmetrical, meaning it assumes direct interstate clashes without the participation of non-state actors. The armies are regular and uniform and should adhere to the rules of the Geneva Conventions governing interstate conflicts. Other typical features of conventional warfare include territorial control as a central objective, the use of conventional weapons, the aim of eliminating the enemy's forces, and adherence to Clausewitzian logic, which regards war as a political instrument (Williams, 2025). With the Russian invasion of Ukraine, it became visible that this way of waging war is still present. It is pursued in accordance with the warfare handbooks of the 19th and 20th centuries. The invasion was to be conducted through a rapid annihilation strategy and was planned to last no more than a week, let alone three years. During this period, the war transitioned from a rapid offensive to a war of attrition. This is implemented by, among others, means of child kidnappings, attacks on residential buildings and civil infrastructure in the whole country. The Russian invasion also reflects a core element of Clausewitz's understanding of war: it functions as an instrument for advancing state objectives. In this instance, it serves multiple goals for the Kremlin, including reinforcing Putin's position in domestic politics and promoting a narrative of restoring the Russian empire. It also serves as a means of drawing Ukraine, and potentially other states from the post-Soviet space, back into Russia's sphere of influence, which in turn is linked to its broader systemic confrontation with the West. The Russian Federation has increasingly relied on measures short of a formal declaration of war in its conflict with the West. This pattern became especially visible after the full-scale attack on Ukraine. At the same time, the conflict demonstrates that methods of fighting are not fixed. Along with artillery, armour, and

territorial defence, the war is complemented by the use of new technologies and other military and non-military means. This mix of traditional warfare and new or improved methods, compared with those that have long accompanied warfare, provides the immediate context for the next section, which turns to the concept of hybrid warfare and the mechanisms through which such approaches are organised and applied.

2.2 *Hybrid Warfare*

The terminology surrounding hybrid warfare is usually foggy because the phenomenon it seeks to capture is itself ambiguous. Scholars conceptualise it in divergent ways and attach different meanings. According to Hoffman, "hybrid warfare can be waged by states or political groups, and incorporates a range of different modes of warfare, including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder" (Hoffman, 2007). Another definition presented by the authors of the paper "Understanding Hybrid Warfare" defines hybrid warfare as "the synchronised use of military and non-military means against specific vulnerabilities to create effects against its opponent. Its instruments can be ratcheted up and down simultaneously, using different tools against different targets, across the whole of society." (Cullen & Reichborn-Kjennerud, 2017).



Figure 1: Methods of Russiaqn hybrid-warfare activity across Europe, January 2018 – June 2025, Source: IISS - https://www.iiss.org/research-paper/2025/08/the-scale-of-russian--sabotage-operations--against-europes-critical--infrastructure/

In a more contemporary approach, Mumford and Carlucci, drawing on MCDC definitions, distinguish hybrid warfare from hybrid threats. They assume that hybrid warfare entails the use of military and kinetic force alongside non-military and non-kinetic means within a military conflict (Mumford & Carlucci, 2022). Hybrid warfare is closely related to hybrid threats. On NATO's webpage, they are defined as a combination of military and non-military means, both covert and overt, including disinformation, cyberattacks, economic pressure, the development of irregular armed groups, and the use of regular forces. The goal of those includes blurring the lines between war and peace and sowing doubt in the minds of targeted populations, aiming at destabilisation and undermining societies (NATO, 2025a). This definition does not address its application in the context of a military conflict. However, it implies the use of military means, such as regular forces or irregular armed groups. Considering the different objectives of Russian operations in Ukraine and in NATO member states, as well as the distinct means used to pursue them, the distinction between deterrence capability building in traditional warfare and hybrid warfare becomes evident. From the perspective of NATO security, and particularly that of the North-Eastern Flank, capability development can be approached in two parallel segments. First, in the current context, where the West is not engaged in a direct full-scale war with Russia and the primary concerns relate to hybrid attacks in their various forms, investment should prioritise defence, resilience, and deterrence tailored to these ongoing challenges. Second, the Alliance must continue to invest in conventional capabilities that underpin deterrence against a potential Russian kinetic attack. These two efforts should be pursued simultaneously and treated as mutually reinforcing. The first is unlikely to become redundant, as the Ukrainian case indicates. Hybrid threats can remain relevant during an armed conflict. They may adapt to shifts toward more traditional forms of warfare, consistent with Russia's recent operational practice across multiple conflicts. Traditional deterrence capacity building is still relevant for the Alliance to effectively deter traditional threats and to avoid full-scale conflict within its borders. However, hybrid threats accompanying hybrid warfare in the conditions of full-scale war can easily spill over into neighbouring countries, especially where the aggressor state has ties to them, for instance, through the provision of military support. These traditional deterrence capabilities fail because they aim to deter different kinds of warfare. Specifics of hybrid threats rely on their blurred boundaries and pose distinct challenges. The first challenge is ambiguity. Although this element is a key component of hybrid warfare and hybrid threats (Mumford & Carlucci, 2022) and is present across all other challenges, I present it here as a distinct challenge. In this matter, the biggest challenge is identifying the perpetrator. This is a consequence of the primary purpose of ambiguity: hindering a response to an attack (Mumford, 2020). It makes the decision about the response riskier and slower, if a response is made at all. Another challenge is that many actions are maintained below a certain threshold of force and intensity, which means that a symmetrical response by a NATO member state may lead to further escalation. In this case, I want to emphasise actions undertaken by military means, which, depending on circumstances, may be kinetic or non-kinetic. By military means, I mean, in particular, the use of fighter jets or armed-capable drones. The third challenge is non-military and material actions, such as cyber and economic activities that can negatively influence the targeted country and, consequently, have adverse political effects. This challenge is particularly evident in economic or infrastructure sabotage. The fourth challenge is narrative shaping and the erosion of public perception of security. Due to disinformation campaigns and other operations targeting Western societies, their sense of security declines, creating divisions among them and simultaneously discouraging citizens of

Hybrid Warfare:
waged by states or political groups, conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder

Ukraine living in those countries from supporting Ukraine as a country. This is evident in the declining support for Ukraine and the willingness to provide further support.

3. Case study – NATO Northern Eastern Flank

Based on the theoretical scope I analysed above, I will review the challenges posed by particular empirical cases of hybrid threats from countries on the Eastern NATO Flank. I decided to focus on two challenges – NATO Article 5 threshold and non-military and material actions. Operations conducted below NATO's Article 5 threshold can be readily illustrated by cases involving overt military activity and kinetic effects, given that Article 5 is invoked by an "armed attack" (NATO, 2025b). At the same time, NATO's own interpretation is broader. Official guidance emphasises that Article 5 is not confined to traditional state-on-state military strikes and that, depending on scale and effect, certain cyber and other hybrid attacks could be assessed as amounting to an armed attack (NATO, 2025b). Nevertheless, Russia's actions have not triggered Article 5, underscoring the persistent ambiguity surrounding hybrid threats and escalation thresholds.

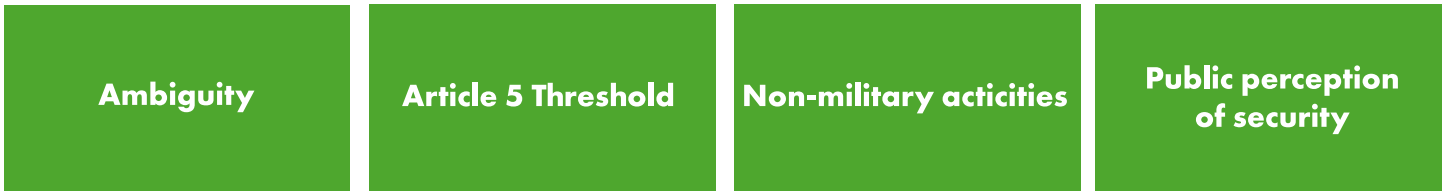

Figure 2: Main challenges posed by hybrid warfare

Two recent incidents fall within this category. On 9 September 2025, 23 drones violated Polish airspace, with some reportedly shot down (Burrows, 2025; Miłosz, 2025). Later that month, on 19 September 2025, three Russian fighter jets entered Estonian airspace for approximately 12 minutes, reportedly reaching up to 10 kilometres inside Estonian territory, while Allied aircraft provided an escort (Szymański et al., 2025). In both cases, Article 4 consultations were initiated (Henley, Krupa, 2025; Olech, 2025), contributing to the launch of Operation Eastern Sentry. Within this framework, Allies provide additional assets to reinforce the Eastern Flank, including fighter aircraft, helicopters, transport aircraft, air-defence systems, surveillance platforms, and frigates (NATO, 2025c). The resulting posture is therefore highly militarised and largely translates into conventional deterrence. However, a key limitation remains. Eastern Sentry does not resolve the cost asymmetry of using expensive, high-end aircraft (including platforms such as the F-35) against comparatively low-cost drones. Moreover, the Estonian case does not primarily indicate Alliance unpreparedness. Rather, it suggests that existing procedures and force posture can function effectively in managing airspace violations. Against this background, proposals to add more traditional and cost-efficient capabilities are justified, yet they do not necessarily imply a broader doctrinal shift in NATO's approach to hybrid threats. Among potential solutions appear conventional measures such as strengthening the national military capacities of Eastern Flank states, thereby reducing excessive reliance on Allied reinforcement in the early phases of a crisis. A more far-reaching alternative would be a policy adjustment toward a more assertive posture against hybrid activities. For example, moving from predominantly reactive responses to more proactive measures, including yet unidentified kinds of pre-emptive strikes or retaliation, as mentioned by the Chair of the NATO Military Committee, Admiral Dragone (Milne, 2025). Responses to hybrid activities that involve military force (or credible kinetic escalation) can often draw on familiar instruments of conventional deterrence. By contrast, hybrid operations conducted through non-military, material disruption, such as sabotage of infrastructure or economically significant targets, pose a different problem. They generate security effects without crossing clear military thresholds, which makes it harder to justify or design Allied responses that rely primarily on military tools. Two recent examples illustrate this challenge. On 25 December 2025, the Eastlink-2 undersea cable

connecting Finland and Estonia experienced an outage (AP News, 2025). In the aftermath, Finnish authorities seized a vessel named "Eagle S", which was reportedly linked to Russia's shadow fleet (Guardian, 2024). Other cases are even more clearly economic and infrastructural in character. In May 2024. A fire was set beneath a shopping centre in Warsaw. Polish authorities described the incident as sabotage coordinated by Russian special forces (Prokuratura Krajowa, 2025). In another episode, in November 2025, Polish authorities reported damage to a railway line between Warsaw and Dorohusk consistent with an explosive incident. Two suspected Ukrainian nationals reportedly fled to Belarus (Michalak, 2025). Across these incidents, one recurring feature is that the alleged perpetrators were not Russian citizens. Most notably, Ukrainian nationals appear in two out of three mentioned cases, while investigative findings and official statements nevertheless point to Russian intelligence involvement in planning or direction. A second pattern concerns accountability. Suspects were either acquitted, as in the Finnish case, or avoided prosecution by escaping jurisdiction, including by crossing into Belarus. Finally, in Poland, these incidents also triggered diplomatic measures, which in result escalated and worsened already tense bilateral relations. The closure of the Russian consulate in Kraków was followed by Russia's closure of the Polish consulate in Kaliningrad, presented as retaliation (Walker, 2025). Following the publication of another investigation, Poland closed the Russian consulate in Gdańsk, and Russia responded by closing Poland's consulate in Irkutsk (Psujek, 2025; Bartkiewicz, 2025).

> **"Traditional warfare is an insufficient tool in dissuading and countering the hybrid threats, and in the case of its usage, there appear to be blind spots and a lack of the desired effect"**

4. Conclusion

NATO's efforts to address hybrid threats rely on conventional military responses, including actions that may involve the use of force. The underlying logic is to reinforce deterrence and signal resolve, in the expectation that a strengthened posture will shape Russian behaviour. This approach was evident in the response to the drone incursions over Poland and, despite the more ambiguous and non-military character of "shadow fleet" activity, in the measures adopted under Baltic Sentry. At the same time, these initiatives should be understood less as a doctrinal innovation than as an incremental expansion of existing instruments and deployments. In both contexts, persistent shortcomings remain evident, particularly regarding accountability. States have yet to develop fully effective legal and operational mechanisms for attributing responsibility, prosecuting perpetrators, and preventing repeat incidents. More broadly, neither military adjustments nor diplomatic steps have thus far been sufficient to halt Russian provocations. Taken together, the current pattern of response remains predominantly reactive rather than preventive, focused on managing incidents after they occur rather than systematically reducing the conditions that enable them.

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About the Article

Should Germany pursue the ambition to build Europe's strongest conventional army given its economic costs and constraints? Rearmament can foster dual-use innovation, industrial restructuring, and strategic autonomy, but only if procurement is reformed, R&D is targeted, and financing becomes sustainable. The ambition is economically viable only under currently unmet conditions. Without reforms and sustainable funding, German rearmament risks becoming fiscally burdensome and ineffective.

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1. Introduction

In light of the Russian invasion of Ukraine, the European post-Cold War security order has been upended. NATO's eastern flank is under pressure, prompting member states to increase their defence spending. Additionally, US reliance is increasingly questionable under Donald Trump. Under these circumstances, Germany has faced growing pressure to assume a greater role in European security. In February 2022, Chancellor Scholz announced the Zeitenwende, which represented the breakaway from Germany's post-WW2 military restraint. It underscored the fact that Europe's security environment changed irreversibly and that Germany's post-Cold War assumptions of peace and stability could no longer be sustained. In this context, Chancellor Merz announced his aim to develop the "strongest conventional army in Europe" (Inayatullah, 2025). This ambition carries implications well beyond the military domain. Rearmament at this scale requires enormous financial commitments, structural reforms and a shift in Germany's self-image. This essay examines whether Germany should pursue this ambition given its economic implications. It concentrates on three key dimensions for assessing the ambition's desirability: Germany's innovation and industrial transformation, its fiscal sustainability, and its implications for Europe's strategic-industrial autonomy. These dimensions capture the core economic considerations that, to a considerable extent, shape the desirability of the ambition. They do, however, not claim to offer a complete account of all relevant factors.

2. The Strategic Shift in German Security Policy

Since 1945, German security policy has been shaped by profound restraint. Germany's role was that of a 'reluctant power', avoiding military leadership and emphasising diplomacy, economic statecraft, and European integration as substitutes for hard power. This posture could also be seen through, on the one hand, the 'peace dividend', which shifted resources from defence to domestic priorities and, on the other hand, through the policy of engagement with Russia, which was based on the belief that economic ties and dialogue could foster cooperation and long-term stability. German strategy thus prioritised economic prosperity and stability over military assertiveness, a pattern of behaviour consistent with long-standing societal scepticism toward militarisation. Russia's full-scale invasion of Ukraine in February 2022 marked the collapse of these post-Cold War certainties. In his landmark speech, Chancellor Scholz declared a Zeitenwende, a turning point in German foreign and security policy. He pledged an immediate special fund to the Bundeswehr, ended resistance to long-standing reforms such as armed drones and confirmed Germany's commitment to NATO's nuclear sharing. The Zeitenwende signalled the definitive end of the previous strategy of engagement with Russia, recognising Russia as a threat to European security. The Zeitenwende thus functioned both as a rhetorical device and as a window of opportunity. Yet, lagged behind rhetoric, as chronic underfunding and bureaucratic procurement impeded the process. With the election of Chancellor Merz, Germany signalled a more ambitious break from past restraint. By exempting defence spending above 1% of GDP from the debt brake, the new government created fiscal space for rearmament. This is a remarkable step up from the Zeitenwende announcement of Scholz, which only involved 100 bn €. Merz's stated aim for creating the strongest European conventional army marks a departure from Scholz's cautious pragmatism, reframing rearmament as a bid for strategic leadership. This shift raises the central question of this paper: not whether Germany can achieve such a goal, but whether it should, given the profound economic requirements and consequences associated with innovation, industrial capacity, and long-term fiscal sustainability.

3. Innovation and Industrial Transformation

Merz's ambition cannot be measured only in terms of troop numbers or platforms. What matters economically is whether rearmament becomes a long-term fiscal burden or a catalyst for industrial and technological renewal. Importantly, while higher defence spending can stimulate industrial activity, the idea that military expenditure creates sustainable economic growth is contested. Empirical studies show that military outlays have weak or even negative effects on long-term GDP growth when measured purely through direct output (Dunne & Tian, 2016; Ilzetzki, 2025). Defence spending becomes economically meaningful primarily when indirect effects are considered, such as R&D spillovers, dual-use innovation and military-civilian technological spillovers (Lehmus et al., 2025). Thus, defence spending can generate positive effects when it is strategically spent and, under the right conditions, can contribute to productivity, technological sovereignty and broader economic competitiveness. The following section examines to what extent Germany's current rearmament approach aligns with these conditions.

Fiscal sustainability:
the ability to maintain higher defence spending over time without undermining long-term budget stability.

3.1 Dual-use Innovation

Value creation in the defence sector is undergoing a structural shift. From hardware like tanks and aircraft toward enabling technologies, such as sensors, data processing, artificial intelligence and secure communication. Industry leaders acknowledge this transition, as Hensoldt's CEO recently noted, the shell of a system matters less than the digital layer that gives it awareness and connectivity (Gebauer et al., 2025). This shift is reshaping market dynamics. Investment in start-ups such as Helsing, Anduril or Quantum Systems has skyrocketed in recent years, with valuations in some cases rivalling established players (Gebauer et al., 2025). Start-ups are moving fast in areas such as AI-enabled situational awareness and drone systems, often specialising in technologies that originated in civilian fields but are now rapidly adapted for defence. The Bundeswehr has recognised this potential: through its Cyber Innovation Hub and the in-house Platform 42 software factory, it actively tests civilian AI applications to assess their usefulness for military purposes (Gebauer et al., 2025). One successful example is the sensor-packed drones by a startup used for the civil purpose of examining earth layers for agricultural purposes, with which the army will be able to identify mines from a safe distance and analyse their placement patterns (Gebauer et al., 2025). Ukraine's experience also shows the payoff of such agility – civilian drone and software innovations were converted into battlefield assets within months (Sohn, 2025). This illustrates how dual-use innovation can accelerate military adaptation. To institutionalise this adaptability, several analysts propose establishing a national/ European DARPA-equivalent capable of funding high-risk, mission-oriented R&D in critical fields such as quantum computing, microelectronics, and cybersecurity (Marin, 2020; Matthews, 2025). Similar agencies in the US and UK have proven effective in translating defence research into broad technological spillovers (see e.g. Erken et al., 2025). For dual-use innovation to scale beyond individual projects, cooperation between defence start-ups and established companies becomes crucial. On the one hand, large firms offer industrial scale, established certification processes, and long-term production capacity, while on the other hand, start-ups bring speed, specialised software expertise and disruptive approaches (Sohn, 2025) (see figure 1). Hence, innovation should be a joint task (Gebauer et al., 2025), but tensions persist. Established companies often prefer proprietary systems, while younger firms advocate for open sources that would allow different systems to communicate seamlessly on the battlefield (Gebauer et al., 2025). The Bundeswehr has already signalled that future procurement will require such openness, but this represents a cultural break with the safeguarding

of expertise of the past (Gebauer et al., 2025). Effective cooperation supported by procurement rules that favour interoperability is a precondition for translating higher defence spending into genuine dual-use innovation. Quantum technologies provide another example of dual-use potential. Quantum computing, sensing, and communication have profound implications for both security and the economy. Given their dual-use characteristics, early and targeted investment in quantum R&D is desirable. However, the Bundeswehr remains unprepared for integration, and Germany's current innovation architecture is too bureaucratic and risk-averse (Steudle, 2025), particularly disadvantaging start-ups with a dual-use focus. This institutional inertia not only delays adoption but also creates security dependencies on third countries and large foreign technology firms (Steudle, 2025). Targeted quantum investment, combined with procurement reform and support for agile dual-use start-ups, could position Germany in a leading position in a critical future technology.

3.2 Industrial restructuring

Rearmament on the scale envisaged by the German government will inevitably reshape the country's industrial landscape. Whether this restructuring is economically desirable depends on whether defence demand can support struggling sectors, preserve high-value employment and enable productive reallocations, without creating rigidities or long-term inefficiency. Germany enters the rearmament phase amid industrial decline. According to recent analyses, the loss of production within Europe is most severe in Germany and Italy (Colliac & Barette, 2025). The decline particularly affects the automotive and energy-intensive sectors (Colliac & Barette, 2025). These sectors face not only cyclical challenges, but also structural headwinds arising from electrification, high energy prices and global overcapacity (Colliac & Barette, 2025). As demand stagnates, industrial excess creates economic and political pressure to find new production opportunities. The growing defence demand in Germany has already triggered factory conversions from civilian to military

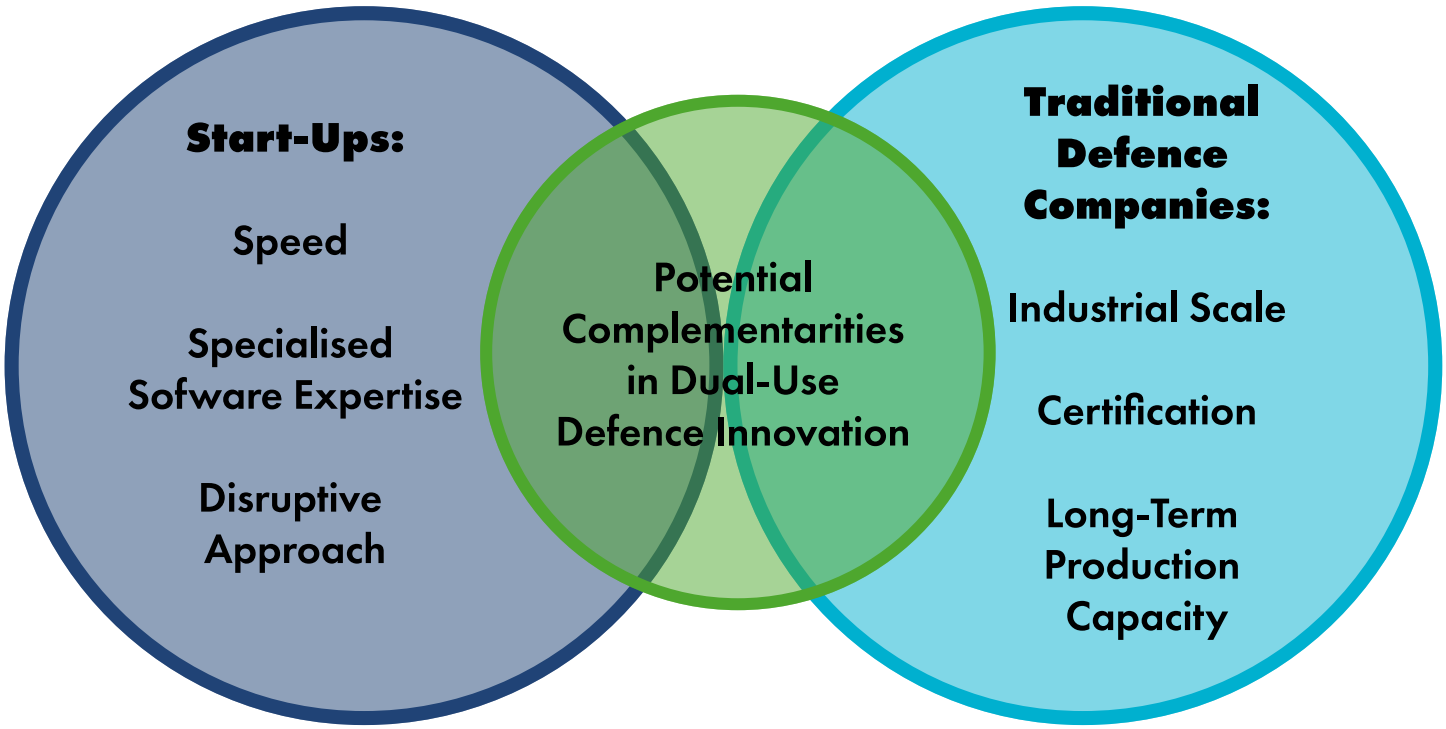

Figure 1: Potential complementarities in dual-use defence innovation

production (Colliac & Barette, 2025). Analysts note that additional industrial capacities could likely be reallocated to defence manufacturing, given that the decline in civilian demand appears at least partially structural (Colliac & Barette, 2025). One example is the automotive supplier Pierburg, which has increasingly redirected capabilities toward military equipment, helping stabilise employment in the sector otherwise exposed to layoffs (Küper et al, 2025). Another example is the company Germandrones, which first developed drones for the agricultural sector, and now mainly produces drones for Ukraine (Küper et al, 2025). However, converting civilian production to military output is neither frictionless nor universally feasible. Defence equipment requires different safety standards, highly specific materials, long certification procedures and distinct development cycles (Wolfenstein, 2025). Firms must navigate stringent export regulations, security clearances and procurement norms, meaning that the transition can be slow, capital-intensive and risky, particularly for companies lacking defence experience (Wolfenstein, 2025). This severely limits the extent to which defence production can offset structural decline in key industries. Taken together, the previous section underscores that economic gains depend on institutional reform, industrial adaptability and the ability to translate spending into productive outcomes. Yet, the factor of long-term fiscal sustainability for the required level of defence investment is equally crucial. The following section consequently turns to this question.

> **Dual-use innovation refers to defence-driven technologies that generate civilian spillovers, making military spending economically valuable only when it boosts broader productivity and competitiveness.**

4. Fiscal Sustainability

Whether Germany's ambition is economically desirable also depends on its long-term fiscal sustainability. At present, Germany meets NATO's 2% target only because of the 100€ billion *Sondervermögen*. By mid-2024, 47.8€billion had already been spent, and the remainder is already allocated and will likely be exhausted by 2027 (Besch, 2025). Germany's ability to maintain the 2% benchmark is therefore secure only as long as the special fund can fill structural gaps in the regular defence budget. After the depletion of the *Sondervermögen*, Germany faces an unresolved financing gap. Estimates suggest that from 2028 onward, the Bundeswehr will require at least 30€ billion per year in additional funding to maintain current plans, even before considering Merz's more ambitious goal (Matlé, 2025). This increase is currently not integrated into long-term budget planning. Covering such a gap would require either significant tax increases, which remain politically unpopular, or cuts in other major spending categories. At the same time, Germany's public debt ratio is projected to rise from 62.5% in 2024 to nearly 71% of GDP by 2030, reducing fiscal room for manoeuvre (Colliac & Barette, 2025). While this is a notable increase, it would still leave Germany's debt level well below that of other major economies (see figure 2). The more binding constraint is whether defence spending is efficient enough to support growth and revenues that can sustainably service higher interest costs. Germany is likely to benefit from a short-term economic stimulus due to higher military spending (Colliac & Barette, 2025), but maintaining this level of expenditure over time requires a credible and sustainable financing plan. Analyses show that temporary spending spikes can be debt-financed, but permanent increases ultimately require stable revenue streams or redistribution within the budget (Ilzetzki, 2025). Without such clarity, firms delay investment and production scaling, resulting in slower capacity growth and more fragile supply chains (Besch, 2025). So, despite the 2025 debt brake exemption and expanded export credit guarantees (Bundesministerium der Finanzen, 2025), these measures improve only short-term financing and do not sufficiently address the long-term structural funding gap.

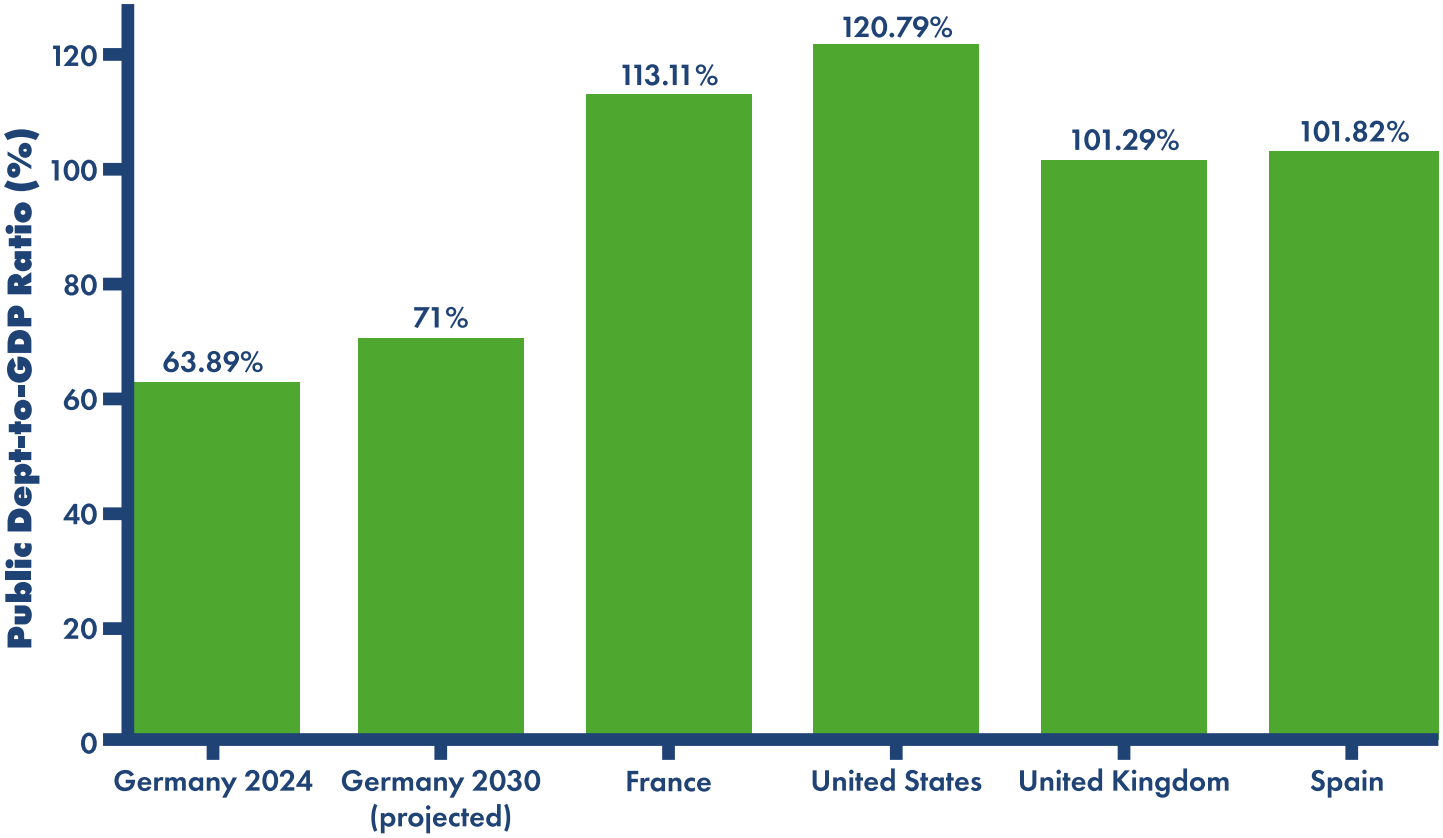

Figure 2: Government Debt Ratios: Germany in Context, Source: https://www.imf.org/external/datamapper/GG_DEBT_GDP@GDD/FRA/DEU/GBR/USA/ESP

5. Defence-Industrial Challenges and Strategic Autonomy

Even if rearmament efficiently generates and operationalises innovation and can be financed sustainably, its economic desirability also rests on whether defence spending can be converted into actual capability. This depends not only on Germany's national procurement structures but also on the broader, often fragmented, European defence-industrial landscape in which they operate. The aim here is not to argue for or against a deeper European coordination, but to assess how existing inefficiencies affect the economic desirability of Germany's ambition. Germany's procurement system remains a major hindrance. A long-standing lack of strategic focus on defence has produced an excessively bureaucratic procurement apparatus. This is not unique to defence, but its consequences are amplified in this sector (Besch, 2025). Even basic equipment shortfalls in the armed forces can be traced to a large part to procedural delays rather than technological limitations (Besch, 2025). To address this, the Bundestag passed a 2022 law to accelerate Bundeswehr procurement. The reform enables authorities to award contracts faster, for example, by speeding up review procedures (Bundesregierung, 2025). Yet firms still report prolonged security clearance processes, talent shortages and the burden of stringent EU procurement and environmental, social, and governance rules (Besch, 2025). As a result, procurement timelines remain misaligned with technological cycles, especially in fast-moving fields like AI and drones. Beyond national challenges, Germany operates within a fragmented European defence-industrial landscape, imposing additional economic constraints. Joint projects could, in theory, pool demand, reduce duplication and increase interoperability. But in practice, the current level of fragmentation produces several inefficiencies and progress is limited. Development cycles still span decades, member states are reluctant to pool sovereignty over key national technologies, and European mergers face political resistance. The Future Combat Air System (FCAS) illustrates how fragmentation affects the economic outcomes. Intended as a flagship Franco-German-Spanish project to develop a sixth-generation fighter and a system-of-systems architecture, FCAS has repeatedly stalled

due to disagreements over industrial leadership, intellectual property rights, workshare allocation and national strategic priorities (Franke, 2025). This illustrates a core dilemma: without political alignment and the willingness to share technological sovereignty, multinational programmes risk producing costly delays rather than capability gains. These challenges stand in stark contrast to models such as the US DARPA model, which achieves rapid development through small teams, agile decision-making and high-risk early-stage funding. This comparison highlights that European challenges are not merely underinvestment but a structural mismatch between fast-moving technological cycles and slow-moving procurement institutions. Without more flexible mechanisms that accelerate early development phases, Europe risks producing late and outdated systems despite high spending. Taken together, these dynamics show that the economic effectiveness of Germany's rearmament ambition depends also on reforming procurement and reducing industrial fragmentation, also in the European context, so that additional funding does not risk being lost to delays or duplication. Moreover, Germany has yet to decide whether to prioritise a more European or national industrial model, a strategic ambiguity that itself undermines efficiency and long-term investment.

6. Conclusion

Germany's ambition to build the strongest conventional army in Europe is economically desirable and feasible only under demanding and currently unmet conditions. The essay has shown that rearmament can support innovation, stabilise parts of the industrial base and strengthen strategic-industrial autonomy and efficiency, but these effects are highly conditional. First, the innovation depends on whether defence spending is directed toward dual-use technologies, agile R&D structures and interoperable systems. Second, fiscal sustainability remains uncertain, and after the depletion of the *Sondervermögen*, Germany faces a huge structural funding gap. Long-term sustainability requires a stable financing plan, which Germany has yet to articulate. Third, economic effectiveness is currently still constrained by slow procurement, regulatory obstacles and a fragmented defence-industrial landscape within Europe. Beyond these economic considerations, broader factors ultimately shape overall desirability, such as the feasibility of meeting personnel targets, the societal legitimacy of an expanded Bundeswehr and Germany's ability to articulate a coherent strategic direction. These lie outside the scope of this paper but remain essential for any long-term transformation. Generally, Germany could turn its rearmament ambition into an economically meaningful project, but only if it aligns spending with technology priorities, secures sustainable financing and reforms industrial structures. Without these steps, the ambition risks becoming fiscally burdensome and strategically ineffective.

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About the Article

This article highlights changes within the CSDP/CFSP framework and evaluates the security and industrial initiatives that reflect this shift. The overall argument rests on the premise that the EU has begun to base its security decision-making on both the traditional intergovernmental level and the supranational level led by the Commission. Despite that, the final decision on defence policy remains the competence of the MS.

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1. Introduction

The transformation of the European military-industrial complex has accelerated in recent years and is seen by scholars as an appropriate response to the geopolitical challenges of the 21st century (Faure, 2025, p. 2). While EU defence industry governance is constrained by intergovernmental decision-making (p. 12), which slows the decision-making process, recent security events, such as the war in Ukraine, as well as the aftermath of Brexit, have catalysed shifts in CSDP (Reis, 2025, p. 184). The Common Security and Defence Policy (CSDP) initiative is increasingly invoked by policymakers and scholars in the international arena as a more effective tool. Notably, the Commission has recently been identified as a crucial leader in initiatives, such as the EU Strategic Compass for Security and Defence (Håkansson, 2024, p. 35). Although it has traditionally not been involved in security-centred decisions within the EU, its role in leading sanctions policy, shaping industrial frameworks, and driving initiatives such as the EU Strategic Compass marks a reconfiguration of authority within the Common Foreign and Security Policy (CFSP) and the Common Security and Defence Policy (CSDP) domain.

This article will highlight changes within the CSDP/CFSP framework and its instruments and evaluate the security and industrial initiatives that reflect this shift. The list of the mentioned policies is not exhaustive; it offers an overview of the most significant developments in recent years, to provide an overview of EU security policies. The overall argument rests on the premise that the EU has begun to base its security decision-making on both the traditional intergovernmental level and the supranational level led by the Commission, thereby facilitating the further development of European security policy. Despite recent supranational developments, the final decision on defence policy remains the competence of MS that need to reach a compromise.

2. The changing role of the EU Commission in defence policy

CSDP is a component of CFSP established by the Maastricht Treaty and fully implemented through the Treaty of Lisbon. It was intended to introduce a standard defence policy, resulting in a common defence framework (Masło, 2024). Unlike other EU policies, the CSDP is governed under the Treaty of the European Union (TEU), and the security cooperation under CSDP remains a MS competence, "resulting from both the TEU and the unambiguous content of Declaration No. 13 on the CFSP" (Masło, 2024, p. 161). The War in Ukraine has led to greater cooperation between MS, especially in defence (Masło, 2024; Sus, 2022). The conflict so close to the eastern border of the EU encouraged "a gradual centralisation and the emergence of new instruments that go beyond the traditional supranational and intergovernmental division" (Sus, 2022, p. 943), within the scope of CSDP. This is not to say that the CSDP has been a dormant structure; in some regards, it was quite the opposite. Missions such as Operation Artemis in the Democratic Republic of the Congo in 2003 and Mission Althea in Bosnia and Herzegovina in 2004 contributed to stabilising the security situation in both regions (Andersson, 2024). However, as Andersson mentions, the CSDP has been described as impactful yet limited due to "the constraint of resources unfilled vacancies; high turnover of staff; and in training missions, lack of follow-up and too few instructors with necessary language skills" (Andersson, 2024). He also identified risk aversion, lack of coordination, poor strategic communication, and restrictions on the provision of arms. More recently, the media has highlighted the Commission's noticeable involvement in the security structures traditionally managed by the MS following the outbreak of the war in Ukraine (Lehne, 2023). Its direct participation in leading the sanctions policy and sanctions packages against Russia (Foukas et al., 2024, p. 101), a role usually fulfilled by the Council

of Ministers (Lehne, 2023), has made the Commission a prominent EU leader, especially in security matters. As Lehne (2023) summarised, the Commission became the answer to Kissinger's question about which phone number to call when wanting to speak to Europe. According to Witney (2025), "The European Commission, equipped now with its own Defence Commissioner and Directorate-General, has emerged as the EU institution best able to address defence issues strategically" (Witney, 2025). Zwolski (2025), however, argues that there is actually nothing innovative in the EU policy pursued to become a geopolitical actor, as it reflects recurring patterns in strategic thinking. Those are dictated by policy constraints, institutional limitations rooted in consensus-building rather than hierarchy, and tensions between integration logics that offer different trade-offs (p. 15). He also raises an important point regarding labour division. There is "a clear differentiation or unstable competition" (Zwolski, 2025, p. 15) between the EU and NATO's traditional domains.

3. Analysis of the prevalent initiatives within CSDP

The following section will focus on the analysis of the most prevalent CSDP initiatives, which represent a change in the way CSDP and CFSP operate and will emphasise prominent policies in these fields in recent years.

3.1 EU Strategic Compass

The European Council adopted the EU Strategic Compass in March 2022 to enhance the EU's defence and security capabilities (Sus, 2024, p. 943). Reis (2025) describes it as a crucial document that outlines the future of the CSDP (p. 177). According to scholars, the adoption of the Compass was driven by positive momentum, with all Member States (MS) motivated to work on the EU Security Strategy amid a worsening security environment, Franco-German cooperation, and the EU institutions—especially the EEAS and the HRVP (p. 947). During its drafting, the Commission has notably increased its involvement. The Heads of State not only agreed with the Commission's proposals regarding the investment and capabilities of the Compass but also instructed the Commission to develop a plan to further enhance it. Ultimately, most of the Commission's proposals were incorporated. Yet as Sus (2024) pointed out, many Member States were concerned about the expanding role of the Commission and even argued that it was exceeding the competencies established in the Treaty (p. 956). However, as the EEAS (2024) notes, since its adoption, the main objectives of the Compass have been met, including the updated threat analysis and the EU Rapid Deployment Capacity (p. 30).

3.2 European Peace Facility (EPF)

Unlike the EU Strategic Compass, the EPF was established before the war in Ukraine. However, it demonstrated its most significant potential once the war began (Foukas et al., 2024, p. 94). In essence, it is an off-budget European fund within the CFSP, based on two pillars: operation and assistance measures. It operates through missions and initiatives and aims to provide measures, such as military and defence equipment, infrastructure, and technical support to partner countries (European Peace Facility, 2024). Since the outbreak of the war in Ukraine, the EPF has been central to addressing the urgent military needs of Ukraine, mobilising a total of €6.1 billion in aid. The competencies of the EFP are dispersed among EU institutions. The Council of the European Union decides on the type of assistance and equipment to be provided, thereby granting Member States decision-making authority, together with the competencies outlined in the TEU, to determine their security. However, the European Commission acts as the initiative's administrator and serves as an internal auditor, responsible for determining the financial implementation of the assistance measure (European Commission, 2025). It thus holds an important role, yet key decisions remain in the hands of the MS.

3.3 Permanent Structured Cooperation (PESCO)

PESCO, which was launched in 2016, is a CSDP mechanism with voluntary membership that aims to deepen defence cooperation by requiring binding commitments without veto power. For many years, it has been viewed

as a tool to address EU security stagnation, relying on NATO security guarantees (Nocoń et al., 2019). However, in 2020, PESCO was also refined through full legislative implementation of the conditions for third-party participation. PESCO is thus a prominent example of differentiated integration within the EU—a process allowing some Member States to advance further in integration while others can opt out (Cózar-Murillo, 2023, p. 1305). The 2025 PESCO Progress Report highlights that it now includes 74 projects, ranging from unmanned ground vehicles to cyber capabilities. It emphasises its focus on addressing capability gaps and strengthening the European Defence Technological and Industrial Base. Another key feature of PESCO is its secretariat, a joint structure comprising the European Defence Agency (EDA), European External Action Service (EEAS), and European Union Military Staff that assists MS in adopting PESCO by providing political expertise (EEAS), military skills (EU Military Staff), and technical development (EDA). Although not central to PESCO decision-making, the Commission is involved in the implementation and funding of projects through the Directorate-General for Defence Industry and Space. The procedure, however, is very lengthy and bureaucratic.

Common Foreign and Security Policy (CFSP):
EU framework established to coordinate member states' foreign policies to preserve peace through cooperation

4. The Commission-led/ assisted security initiatives

As mentioned, in recent years the Commission's president, Ursula von der Leyen, has advocated for "Europe as a geopolitical power" and the EU defence agenda, grounded in the principles of the single market. Although it has not been the sole body promoting this agenda, the direction of the Commission is "notable" (Zwolski, 2025, p. 6). The following policies mirror its involvement in shaping the EU's defence policy.

4.1 European Defence Fund (EDF)

The EDF is a €7.3 billion fund for 2021-2027, managed and operated by the Commission. It aims to allocate funds for defence research and development and for capacity building that complement national contributions (European Commission, n.d.). The EDF has annual work programmes that set out the topics to be addressed. For 2025, it focused on investment in defence research, allocating €1.065 billion for collaborative research and development in the field of defence, which were agreed as priorities by the MS. Since the adoption of EDF in 2021, the Commission has invested €5.4 billion, which made it the top investor in research and development of defence. Nevertheless, the framework still has some limitations. Brehon (2025) emphasises that, although it makes significant R&D investments, one should not assume that (1) it will have the capacity to fund more costly project, as most projects were below €5 million (see Figure 1) (2) that EDF will finance "future strategic bomber or the development of European Patriot missile defence system" [...]. "The EDF remains a marginal tool in capacity development" (Brehon, 2025). The leading positions in defence coordination are held by France, Spain, and Greece, even though in 2024 their dominance had diminished, accounting for only 40% of projects compared to 63% in the first year of EDF operation. Regarding the Commission's role specifically, Brehon (2025) also emphasises that, in the 2026 draft budget, funds allocated under the Multiannual Financial Framework (MFF) are down by 30% in commitments and 20% in payments. Additionally, in the current structure of the MFF for 2026-2034, defence as the focus in the current geopolitical situation, "does not even have a heading in the plan" (Brehon, 2025).

Distribution of funding (numbers and %)

	2021	2022	2023	2024	Total
Under 5 Million €	26 (43%)	16 (39%)	24 (39%)	26 (43%)	**29 (4%)**
Between 5 and 20 Million €	15 (25%)	9 (22%)	18 (30%)	20 (31%)	**62 (27%)**
Between 20 and 50 Million €	11 (18%)	11 (27%)	10 (16%)	12 (20%)	**44 (20%)**
Over 50 Million €	8 (13%)	5 (12%)	9 (15%)	4 (6%)	**26 (12%)**

Figure 1: EDF support for the defence industry (2021-2024),
source: https://www.robert-schuman.eu/en/european-issues/801-unsettling-shifts-in-the-european-defence-fund

4.2 The European Defence Industrial Strategy (EDIS)

EDIS is the first-ever European Defence Industrial Strategy, a joint communication of the HRVP and the European Commission, outlining the plan for defence industrial policy until 2035 (European Commission, n.d.). Unlike PESCO, which focuses on military cooperation, EDIS explicitly targets the EU defence industrial base, including how the EU invests, produces, and builds defence equipment—such as resolving supply chain tensions and identifying bottlenecks in EU security of supply (European Commission, n. d.). This marks a significant shift in EU security policy, as it aims to address the core of defence production, enabling not only cooperation among Member States but also preparing for a European Military Sales Mechanism to improve the availability of EU equipment (European Commission, n.d.). These investments and reforms are to be financed by the European Defence Industry Programme (EDIP), with a budget of €1.5 billion, allocated to defence projects for MS and to support for Ukraine (European Commission, n. d). One of the key criteria for accessing the funds is the requirement that at least 65% of the component costs of a given defence product come from the EU or partner countries (Siwek, 2025). The Parliament's adoption is the final legislative step, and the Member State's approval is seen as a formality in this matter. Once approved by the MS, the project is considered a key financial instrument for investment in the EU.

Common Security and Defence Policy:
An element of Common Foreign and Security Policy aimed at conflict prevention, crisis management and peacekeeping.

4.3 EU Defence Readiness Roadmap 2030

The Initiative was jointly produced by the Commission and the EU's foreign policy chief and was endorsed at the European Council summit on the 23rd of October 2025. It is a comprehensive initiative based on the EU defence white papers, presented in March 2025 and co-authored by the HRVP Kaja Kallas and the European Commissioner for Defence and Space, Andrius Kubilius (EEAS, 2025). As Witney (2025) summarises, it focuses on modern warfare and transformations that are needed in defence capacities, key capability priorities and focuses on four flagship projects:

- The Eastern Flank Watch
- European Drone Defence Initiative
- ´European Air Shield
- European Space Shield

All of these initiatives are said to "aim at high tech and AI-enabled defence thinking, network systems stitching together missiles, robots and surveillance assets, forward defence and European cooperation to achieve independent interoperable strategic capacity" (Witney, 2025). Importantly enough, as Witney highlights, with this project the intention is to "hold Member States 'feet to the fire' - to introduce new concepts, milestones etc. with annual progress reports by the roadmap's authors to an October EU summit" (Witney, 2025). Overall, the Commission compares its implementation to the introduction of the single market and the euro, in which it plans to play a leading role.

5. Conclusion

The CSDP and CFSP have undergone significant shifts in recent years. Established initiatives such as PESCO, the EPF and the Strategic Compass have gained new momentum. At the same time, the European Commission has become an initiator of new defence policies, managing funds and driving the development of a growing number of instruments. The war in Ukraine has been the primary factor driving the shift in security policymaking. Still, some challenges have been identified. Uneven participation and benefit from initiatives, limitations in coordination and importantly, the lack of certainty in financial stability regarding the defence spending plan within the MFF. Addressing these tensions must be taken into consideration, especially given the importance of defence on the EU agenda. The benefits should be distributed accordingly, along with the appropriate alignment of competencies between the actors. All in all, these initiatives show that the EU is actively working to shift its defence architecture from a reactive framework to a strategically cohesive one. The ability of MS and institutions to close capability gaps, fortify the European defence industrial base, and maintain political unity in the face of protracted geopolitical competition will determine whether this transformation lasts. Yet one has to bear in mind that, in the end, the final decision is the competence and prerogative of the Member States, which is imprinted in the very design of the European Union competencies. This inherently limits the extent to which the EU can act autonomously as a unified security actor.

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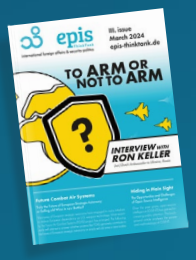

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About the Interview

The tacit knowledge involved in the defence sector makes it difficult to simply convert civilian facilities and personnel into assets of the defence sector. States need to be strongly engaged in defence-related R&D. We should have a more sober and fact-based discussion about autonomous weapons systems. Autonomous or semi-autonomous weapons have been operational for a long time. While these weapons systems come with risk, human error remains one of the greatest risk factors in war.

About the interviewee

Prof. Dr. Mauro Gilli is Professor of Military Strategy and Technology at the Hertie School. His research focuses on military-technological competition, strategic rivalry, and modern operations, with work published in journals like International Security. He previously served as a Senior Researcher at ETH Zurich (2016–2025). Gilli holds a PhD from Northwestern University and an MA from Johns Hopkins SAIS. He is a recipient of the Best Academic Article Award from the America in the World Consortium.

About the Interviewers

Xerxes Hafezi Rachti is currently enrolled at the Hertie School, studying International Affairs with a focus on International Security. At the University of Mannheim, he attained a multidisciplinary bachelor's degree in English and American Studies and Business. His research focuses on technological innovation, strategic competition, and military operations.

Jolina-Zoe Zarda is a Master's student in International Affairs at the Hertie School, Berlin, specialising in international security. She holds a BA in International Relations and International Organisations from the University of Groningen. Her interests include security and defence, peacekeeping, and non-state actors. She has experience with the Friedrich-Ebert-Stiftung in Athens and is active in the Hertie Security Student Club and the German Council on Foreign Relations.

Jolina-Zoe Zarda:

Welcome to this brief interview on the broader issue of the defence industrial complex. We may start by discussing the possible integration of the civilian and defence sectors. Politicians often claim that Europe's industrial capabilities can easily be repurposed for defence needs. How realistic are calls to repurpose existing manufacturing capabilities from other sectors to serve the manufacturing of military equipment, such as tanks and ammunition, in your view, and why?

Prof. Dr. Mauro Gilli:

Thank you. Generally, certain parts of a country's industrial base can be utilised in the defence sector. However, it is important to emphasise that this is a broad observation with several important limitations. There are components, subcomponents, and parts that, in some areas, overlap and create synergies between the industrial, commercial, and defence sectors. For example, some commercial screws, fasteners, and bolts can be used, depending on the context, also in the defence sector. However, as the performance of a given system increases, and operational or environmental conditions in which it operates become more demanding (e.g., speed, depth, etc.), such opportunities for synergies shrink significantly. This is even more so for defence-specific treatments, parts, subsystems, and systems – e.g., chromium plating for cannon barrels, artillery shells and munitions, defence electronics, and propulsion systems, etc. This does not imply that synergies between the commercial and military industries do not exist; rather, it points to difficulties for the following reasons. First, consider the materials themselves. In the defence industry, materials need to meet specific technical requirements (e.g., in terms of mechanical strength, thermal fatigue, fracture toughness, and others), and often defence companies need very special alloys that do not have application in the commercial sector. Access to the required raw materials – including metals like antimony, titanium, tungsten, and others – with extensive applications in defence but much more limited ones in commercial use – must be secured. Secondly, these alloys and metals need to go through high-precision machining. But since the material properties of these alloys and metals differ from those in the commercial sector, and since the technical specifications they have to meet are much higher than those in civilian applications, specialised machine tools are necessary. To put it bluntly, the tools needed to cut antimony, tungsten, or titanium are utterly different from those used for light aluminium. Similarly, the specialised workers, particularly those forging, machining or welding the metals mentioned above, possess skills and know processes that are completely different from those in the commercial sector. This means that while you can retrain these individuals, it takes time. Ultimately, having an industrial base can be helpful, but it is far from enough to boost defence production, since you need very specific skills, capabilities, and machinery at all levels. This becomes even more evident when dealing with explosives and munitions. Storing explosives is entirely different from storing tyres, so when setting up a production plant for artillery, the production plant must be organised around the need to

ensure safety and to comply with governmental regulations about handling explosive materials. These are requirements and regulations the car industry does not need to meet.

Jolina-Zoe Zarda:

Thank you, it seems like there is a lot of work to be done. What role does the state play in defence R&D, and what importance do you ascribe to it?

Prof. Dr. Mauro Gilli:

The role of the state is essential, primarily because the defence industry needs to supply goods that are difficult to value by the market. The importance of the defence industry appears clear now that the stock market valuations of defence firms have risen markedly because people recognise this need. But this was not the case ten years ago or even five years ago. This means that markets do not anticipate these needs quickly enough and have a much shorter time horizon than the one required for defence investment. Therefore, consistent funding for these companies is essential because the moment you need to increase production, it is too late. Defence capabilities must be sustained continuously, which highlights the difference between the goals of commercial and defence technologies. Commercial technologies are tailored to customer tastes and preferences, often with price in mind. Price is not the deciding factor for all goods, but it plays a significant role in most. However, this is not true for weapon systems. They need to perform effectively on the battlefield, so price is less critical.Since price is less critical and these systems are valued for meeting specific battlefield performance requirements and other operational or strategic objectives, markets may not be the most effective method to determine which R&D to pursue. I'm not referring to efficiency, but effectiveness. Therefore, states are vital to sustained and well-directed defence R&D.

Xerxes Hafezi Rachti:

Staying on this topic, we would like to hear your opinion on defence sector cooperation. How can we tackle current cooperation problems, for example, with FCAS?

Prof. Dr. Mauro Gilli:

Well, these are inherently difficult to address because, at the end of the day, defence is a prerogative of the states. Each state has its own specific incentives and interests, which often do not align with European interests and incentives. Cooperation in the defence industry is unusual because, for many actors involved, primarily the companies and the national governments hosting these defence companies, cooperation is not convenient, whether in terms of revenues or political considerations, namely, employment. In the end, cooperation entails consolidation, and consolidation means firing workers and closing production plants. Therefore, national governments are often reluctant to closer cooperation in defence, as they do not want to lose jobs, which is often a primary consideration. Cooperation is generally perceived as good because the word has a positive connotation, but many tend to ignore the downsides. Related to this, there is a wider problem in Europe: for at least the past 30 years, many have been fixated on increasing defence cooperation across the continent. The idea of a more integrated defence industry sounds promising, but the often-overlooked problem is that cooperation is a means, not a goal. Possibly more problematic, innovation has received considerably less attention than cooperation.

Xerxes Hafezi Rachti:

More specifically, should the EU permit mergers to create fewer but larger industrial champions, or do you believe that a greater diversity of smaller companies is more efficient?

Prof. Dr. Mauro Gilli:

The European Union not only permits but also actively encourages member states to promote mergers and acquisitions. The main point is that many nations have resisted this push and decided to halt mergers between countries. There are clear advantages to mergers. A Bruegel study from a few months ago found that the unit price of armoured vehicles is significantly higher due to fragmented production in Europe. This makes sense because lower production volumes lead to reduced output, which

increases the fixed cost per unit, resulting in much higher prices. This is expected; thus, we should promote mergers, but it is also important to remember that this is not a complete solution to all of Europe's issues. Maintaining some diversity could offer strategic benefits. Having multiple types of weapon systems that Russia must contend with is actually advantageous. There is more than one correct approach to this issue. I want to emphasise that there should be a broader discussion considering multiple trade-offs.

Jolina-Zoe Zarda:

Now, we would like to shift to quasi-autonomous weapon systems. What is your perspective on the implementation of these systems, like drones that are used in swarms or kill zones where hostile forces are automatically engaged?

Prof. Dr. Mauro Gilli:

First, over the past 10 years, there's been a debate that I found was a bit curious, with many people calling for these systems to be banned because, according to this emerging view, autonomous systems would represent a serious threat to humanity. The truth is, many autonomous or semi-autonomous systems have been operational for a long time, and many people did not realise. American ships are equipped with the so-called Phalanx CIWS automatic cannon. The idea is that because enemy missiles can fly low and skim the waterline at sea, the available reaction time to an incoming missile would not be sufficient for a human being to engage the threat. This automatic cannon engages as soon as something approaching the ship meets some specific parameters (e.g., speed, direction and others). Similarly, anti-radiation missiles have been used since 1982. This autonomous system detects the target, identifies it, and then strikes. These systems have existed for some time, and with technological progress, it is now possible to further enhance their applicability. Of course, autonomous systems raise some concerns, but generally, we also know that in war, many accidents occur due to human error. The conventional view is that there should be a human in the loop to prevent accidents and problems. While this is true, we must also remember that humans are often the source of error, so this is not a complete solution. There are debates that delve into sci-fi and dystopian fiction, but I think it is not worth to have a much more sober and fact-based discussion.

Jolina-Zoe Zarda:

If these systems possess advanced capabilities today, do you think it is a necessity for Europe to invest in such systems to offset disadvantages in manpower, or do you consider the technical risks as too high?

Prof. Dr. Mauro Gilli:

Sure, yes—but it's important to remember that we still require military personnel. For example, the challenges Ukraine faces in the Donbas stem from a shortage of manpower. No matter how advanced the systems are, they cannot fully replace personnel. Autonomous systems can help, but it should not exempt us from considering how to meet the demands for military personnel in Europe.

Xerxes Hafezi Rachti:

Now, onto our last aspect, the Russian defence industry. To you, are there any obvious steps the EU has missed in their efforts to reduce the capabilities of the Russian defence industry? More specifically, given how sanctions are implemented, is there potential to reduce Russia's capabilities?

Prof. Dr. Mauro Gilli:

Russia has managed to circumvent sanctions, and this could be addressed by simply looking at the exports of some specific European companies. Robin Brooks shows on Twitter how exports to Central Asian countries like Kazakhstan and Kyrgyzstan by European countries like Italy, Germany, and France have skyrocketed since the invasion of Ukraine. Such a sudden increase in demand by these countries leaves little doubt about what is going on: some fictional companies in these countries buy goods previously purchased by Russian companies, and of course, these goods never reach the intended address, and stop somewhere else in Russia while in transit. These exports could be prevented. The second critical aspect is

machine tools. There is a report by Rhodus on how Russia manufactures its missiles. It's fascinating, and it shows that Russia requires high-precision machine tools from European countries, specifically Southern Germany, Switzerland, Northern Italy, and some from the Czech Republic, possibly supplemented by South Korea. Without those high-precision machine tools, the Russian missile industry cannot survive. China cannot help in this instance because it has not yet produced such high-precision machine tools. Therefore, European countries could address this issue very quickly. We approach these companies and ask them what their next orders to any of these Central Asian countries are and at what price, and we, Europeans, buy these machines. The company doesn't lose anything; we keep the production going, which is very important for this industry, and for European countries, it's a minimal cost with significant effects.

Xerxes Hafezi Rachti:

Thank you for taking the time to participate in this interview today.

Prof. Dr. Mauro Gilli:

My pleasure, these are very important topics and your questions focused on some of the most critical aspects. Thank you.

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About the Interview

Role and Impact: As BDLI's Managing Director, she represents 260+ companies in the German aerospace sector, which employs 115,000 people and generates €46 billion annually. Strategic Pillars: BDLI focuses on civil aviation, military aviation, and space, driving innovation in climate-neutral tech and defense. Future Growth: The industry faces high demand due to defense backlogs and the commercialization of space.

About the interviewee

Marie-Christine von Hahn is the Principal Managing Director of the German Aerospace Industries Association (BDLI). A seasoned expert in industrial interests, she represents over 260 member companies, bridging the gap between politics, industry, and society. She previously held senior leadership roles at Aurubis AG, specializing in sustainability and external affairs. Born in Hamburg, she studied in Potsdam and Barcelona and now lives in Berlin.

About the Interviewers

Jan Fritsche joined EPIS as a Public Affairs consultant from Berlin. He completed his BA in Governance & Public Policy at Passau University and holds a MS in Peace & Conflict Studies from Umeå University in Sweden. In addition to a stop with the European Commission and serving as Umeå Association of International Affairs' Head of Programme, he completed the United Nations' Staff Officer Programme at the German Armed Forces Command and Staff College which benefits him in his role as EPIS Fellow.

Theodor Himmel connects students with experts in diplomatic and economic affairs. Together with his colleagues, he built EPIS Think Tank into one of the largest student-led think tanks in Europe and also initiated the EPIS Network. He currently serves as Chairman of EPIS. Alongside this, after completing an LL.M. at Leiden University, he is finalizing his legal training as a law clerk at the Regional Court of Baden-Baden. Currently, he works as a consultant in a Munich-based family office.

1. About the person – Marie-Christine von Hahn

EPIS:

Dear Ms. von Hahn, thank you very much for the invitation to speak with you today. As a representative of the German Aerospace Industries Association (BDLI), you are a stakeholder within a security sector that is currently experiencing massive momentum. But before we turn to your organisation and your industry, a few questions about you personally. Where and what did you study, and how did your path to BDLI ultimately unfold?

Marie-Christin von Hahn:

Thank you, it is a pleasure hosting EPIS today. I completed my studies at the University of Potsdam in 2004 with a master's degree in English Studies, American Studies, and Spanish. During my university days, I quickly embraced a vital passion for communication. I realised that I enjoyed working with many different people and that I had a fundamental interest in politics. After a series of internships and a traineeship at a PR agency, I began working as a research associate in the German parliament (Bundestag), in 2006. Here I quickly found myself dealing with topics that – due to their link to industrial policy and, as a consequence thereof, social responsibility – were subject to controversial debates. A pattern that would continuously accompany me throughout my professional career. In 2009, I moved to Wintershall Holding, where I worked as a lobbyist in the Berlin office before I joined Aurubis, Europe's leading copper producer. There I spent ten years inter alia as the Berlin representative and head of politics and sustainability. In October 2024 I joined BDLI as Principal Managing Director, diving into the fascinating realms of the aerospace sector.

EPIS:

A highly interesting path and combination of academical background and professional career! What advice would you give students closing in on their graduation – a well elaborated five-year plan or trusting in the job market to provide you with eventually unforeseen opportunities?

Marie-Christin von Hahn:

Fundamentally, I don't think there is a one-size-fits-all answer; it's a very individual matter. Some people feel more comfortable with a fixed plan, while others let life come to them and trust that new opportunities will arise. Both can be equally successful. However, what is always beneficial is building networks, meeting people, and attending events in order to engage in conversation. Another aspect is the professional component. If I know, for example, that my heart beats for security policy, I see no reason to abandon that passion. Passion and

enthusiasm are a solid foundation for professional growth. At the same time, internships are a good way to get to know both specific subject areas as well as personal interests, strengths and weaknesses.

EPIS:

You already began to describe your work within its framework and your passion towards it. What, for you, defines political communication as a profession and what motivates you to carry out this job in a leading role?

Marie-Christin von Hahn:

I have always felt an urgent need for controversial topics such as nuclear waste disposal and reactor safety to be discussed and, ideally, resolved through dialogue. I believe that, in this context, we need people who can and want to communicate, to do this essential explanatory and translation work between the public, politics, and the sectors or industries involved. It is in this communication that I found my passion.

2. About the organisation – German Aerospace Industries Association (BDLI)

EPIS:

Today you are operating in the highly complex technological field of aerospace. How great is the need for the explanatory and translation work you mentioned, for example in dialogue with politics or the media?

Plausible Deniability:
Describes the ability of a state to deny knowledge or responsibility for actions (like those of private military forces) due to a lack of clear evidence.

Marie-Christin von Hahn:

Essentially, our work is about creating and designing a functioning German and European aerospace sector. However, this is a sector in which many different stakeholders operate and are involved. BDLI, as the voice of the aerospace industry; research institutes; legislators; and the public which must understand why the Federal Republic of Germany invests financial resources in this sector. A high level of technological understanding can generally be assumed in dialogue with experts. Yet, in recent years we observed a broader awareness and substantive understanding of defence and space issues among the media as well. We have had many conversations with journalists who suggested to us that public interest in these topics is growing. A development which we perceive to be both important and needed in order to face today's challenges and to gain acceptance among the public towards urgently needed investments in the aerospace sector.

EPIS:

Despite this growing public interest and awareness, are there still challenges that BDLI faces in its work and communication?

Marie-Christin von Hahn:

BDLI encompasses three strands – civil aviation, military aviation, and space. All three areas are fascinatingly different, enfolding their own dynamics and challenges. One vital reason for this phenomenon are fundamental differences in their financing and business models. Civil aviation is a commercial business, with procurement mechanisms and contracting processes very different from those in the military sector. The same applies to space, where there is still an enormous need for awareness-raising and investment in research. Considering and balancing these different structures within BDLI's spectrum can sometimes be challenging. At the same time, many of our members are active in more than one of the three areas creating valuable synergies that undoubtedly outweigh occasional challenges. These synergies are also reflected in our political advocacy work. How closely intertwined BDLI's branches are is, for instance, demonstrated by the German government's current ambition to develop an updated comprehensive aviation strategy. An endeavour in which the German Federal Ministry for Economic Affairs

and Energy, the Federal Ministry of Transport and the Federal Ministry of Defence are closely working together in order to develop a framework that enhances innovation and fully unleashes the potentials of the German aerospace sector – explicitly linking civil and military aviation.

EPIS:

Very interesting developments within Germany's Aerospace sector, to say the least. Does BDLI also maintain relations with European or international organisations and "sister associations"?

Marie-Christin von Hahn:

In addition to our European umbrella organisation (ASD), BDLI maintains particularly close dialogues with its sister associations in France (Groupement des Industries Françaises Aéronautiques et Spatiales, GIFAS) and the UK (ADS Group). These are primarily our peers, and we work very closely and gladly with them.

3. BDLI in European and global context

EPIS:

That provides us with a great opportunity to take a look at the big picture. In Germany, there is currently a shift in the previously restrained public opinion regarding investment in the defence sector – special funds were recently approved by parliament. Are there similar patterns to be observed in other European countries?

Marie-Christin von Hahn:

In Germany, we previously held on to the illusion that we could avoid rearmament and rely on protection from others. Now, the Bundeswehr is facing urgent investment needs in every area – from infrastructure to equipment to personnel. Looking at other countries, we see a different self-perception, and a different respect and standing of the armed forces in society. At the same time,



Figure 1: During the Interview

I understand that not everyone is inclined to join the Bundeswehr. Fundamentally, however, I am convinced that the current debate in European countries is no longer about whether to invest, but how to invest.

EPIS:

Since we are already discussing the European context, we would like to address another current issue. In June 2025, the European Commission presented the "Space Act," a legislative initiative regarding a harmonized framework for the space sector within the EU. How did BDLI, possibly in cooperation with your European sister associations, accompany or prepare for this process?

Marie-Christin von Hahn:

We are very convinced that it is important to create a consolidated European regulation for the space sector. However, European regulation always carries the risk of overreach, potentially hindering the sector more than helping it. It goes without saying that in a highly complex sector like space, a completely unregulated environment is not possible. The legislator's goal, however, must be the minimum necessary level of regulation – while still allowing the sector to pursue and unleash its full economical potential. A regulatory framework exceeding this logic will ultimately impede the sector's ability to compete on the global scale. Another weighty requirement in this regard is trust. Trust in the aerospace sector and its companies. Unfortunately it seems to me that in Europe and in Germany we still suffer from a strong mutual mistrust – expecting industries to aim for regulatory loopholes rather than trusting them to operate with good intentions, aiming to contribute. Here I see a urgent need for fundamental change from which all stakeholders could benefit. For now we – as representatives of the German Aerospace Industries – have to analyse the EU Space Act: does it embody a spirit of trust that ensures freedom of action or does it create a structure that stifles potential. We will see.

> **"Uniting more than 260 member companies... the BDLI serves as the single voice of the German Aerospace Industry, distinguished by its international technological leadership and global success."**

EPIS:

Speaking of potential. How has the space sector and its economic potential developed in recent years – what impact have private initiatives such as Elon Musk's SpaceX project had on the European sector?

Marie-Christin von Hahn:

: I think that in the US there has always been a broader enthusiasm and deeper awareness for space. Projects like SpaceX have certainly contributed to merging the space sector with private enterprise. Accordingly, the commercialisation of space as an economic factor is more advanced in the US than here. In Germany, the state remains the anchor customer. This applies to the state's vision, procurement contracts, research programs and space missions. That is probably the most fundamental difference to the US. What gives us hope, however, is the newly created Federal Ministry for Research, Technology, and Space in Germany. A development which shows that awareness for investment demands is growing.

EPIS:

How do you assess developments in the defence industry in the wake of Russia's invasion of Ukraine? What observations can be made in Germany and in the broader European context?

Marie-Christin von Hahn:

Tragically, the situation in Ukraine is creating a huge demand for armaments. History has shown time and again that wars – I regret to stress – have always gone hand in hand with innovation and technological change. The current surge in the use of drones and artificial intelligence is proving this once again and is leading, across Europe and in Germany, to undeniable growth in demand as well as innovation capacity.

EPIS:

You mention innovations in the defence sector. Increasingly, defence startups are calling for easier market access and simplified procurement processes by the federal government as anchor customer. How do you, as BDLI, assess this development – do you see potential or competition?

Marie-Christin von Hahn:

We believe it is right and good that startups are insisting on recognition in the defence sector. As BDLI, we represent stakeholders from the aerospace sector, including startup companies, hopefully in increasing numbers. The larger companies we represent – many of which already have close cooperation with the Bundeswehr and far greater financial staying power – also value the input and perspectives startups bring. They think in agile ways, take new paths, and try things out. That is why we appreciate, in all three of our areas, the synergy effects that emerge from the interplay between established companies and startups.

EPIS:

To conclude this interview, we would like to ask what the future holds for aerospace and what advice you would give our members, most of whom are students, if they are interested in a professional career in your sector.

Marie-Christin von Hahn:

The future of the (German) aerospace industry is certainly very stable – partly for good, partly for less pleasant reasons. Ultimately, this is a sector in which we will not relent in the future. Both in terms of space applications and investments in the defence sector: there is an immense backlog to catch up on. At the same time, civil connectivity and aviation are advancing in course of which we must also account for climate change and urge for climate neutral technologies. In all three pillars of BDLI we therefore have gigantic development paths which makes it absolutely worthwhile to consider aerospace as a versatile field of activity. In our career portal we provide insights into this diverse world – both within our association and among our member companies



Figure 2: Theodor Himmel & Marie-Christine von Hahn



About the Article

How can Europe strengthen its position in the field of rare-earth elements (REEs)? Onshoring, allied shoring, and nearshoring, underpinned by suitable EU-level mechanisms, are best conceptualised not as rival strategies but as complementary and mutually reinforcing tools. Europe's dependence on REEs supply chains constitutes a vulnerability that necessitates a sustained and pragmatic effort to reduce dependency in order to safeguard its defence credibility and industrial resilience.

About the Author

Karolina Kisiel is a Master's student in War and Defence at the Swedish Defence University and an International Relations graduate of University College Maastricht. Her interests include transatlantic ties, NATO's eastern flank, Chinese foreign policy, AI in defence, and hybrid warfare. She has worked at the U.S. Congress (TFLF) and the Embassy of the Republic of Korea in Warsaw, co-founded the Mare Balticum Institute, won the 2025 Cybersecurity Challenge, and was a 2025 Cyber 9/12 semi-finalist.

1. Introduction

Amid renewed calls for Europe to strengthen its defence capabilities, a long list of priorities emerges, from fighter jets and tanks to missiles, ammunition, electronic warfare, and radar systems. These assets share a common denominator: their production depends on rare earth elements (REEs). Like much of the world, Europe has grown increasingly dependent on China, which accounts for nearly 70% of global REEs mining and approximately 90% of global REEs processing capacity (Baskaran & Schwartz, 2025b; Mining Technology, 2025). This concentration is far from accidental as China maintains export restrictions on REEs refining and processing technologies (Members' Research Service, 2025; Teer, 2025), effectively preventing competitors, including Europe, from replicating these capabilities and entrenching its long-term dominance across the supply chain. To translate these constraints into policy choices, this article asks: How can Europe strengthen its position in the field of rare-earth elements (REEs)? It argues that no single solution can resolve Europe's REEs dependency in isolation. Instead, a layered approach combining onshoring, allied shoring, and nearshoring offers the most credible pathway towards greater resilience.The article proceeds in six parts. It first clarifies how rare REEs are in practical terms. Second, it briefly describes the role of REEs in modern defence systems. Third, it traces the EU's evolving recognition of REE's strategic relevance and identifies key risk points in Europe's current supply model. Fourth, it assesses Europe's potential strategies for mitigating these risks: 1) onshoring, 2) allied shoring, and 3) nearshoring. Fifth, the article elaborates on potential mechanisms and bodies Europe could use to enact the identified strategies. The article concludes by outlining policy implications for building a more resilient European REEs framework.

2. How "Rare" Are Rare Earths?

Contrary to common belief, REEs are not scarce. Their perceived "rarity" stems instead from the difficulty and cost of extracting, separating, and refining them into usable metals (Kalantzakos, 2017c). REEs deposits are chemically complex, vary significantly by location, and require highly specialised, deposit-specific processing techniques (Andrews-Speed & Hove, 2023). Moreover, these processes are capital-intensive, technologically demanding, and environmentally hazardous, generating toxic waste streams and, in some cases, radioactive by-products (Filho, 2016; Kalantzakos, 2017b). These characteristics explain why REEs processing is often economically unviable without sustained state support. Market prices alone rarely compensate for high upfront investment costs, regulatory burdens, and long development timelines. As a result, private actors face weak incentives to enter and remain in the sector. Policymakers therefore confront a structural dilemma: how to maintain domestic capacity for materials that are indispensable to national security, yet remain commercially unattractive under market conditions.

3. Rare Earths in Defence

The aforementioned challenges must be addressed if Europe is serious about building its own defence industrial base, of which REEs constitute a critical pillar. They are essential for advanced sensors, secure communications, precision-guided munitions, radar systems, permanent magnets, and heat-resistant alloys (Girardi et al., 2023), among others. Yttrium, neodymium, and dysprosium, for example, are integral to electro-optical targeting systems, propulsion units, and navigation components used in fighter aircraft and armoured vehicles. According to the U.S. Department of Defence estimates, producing a single F-35 fighter aircraft requires approximately 417 kilograms of rare-earth materials (Grier, 2017). Figure 1 illustrates an exemplary use of REEs in an infantry fighting vehicle. This functional centrality explains why REEs gradually moved from the margins of EU industrial policy to the core of strategic and defence planning.

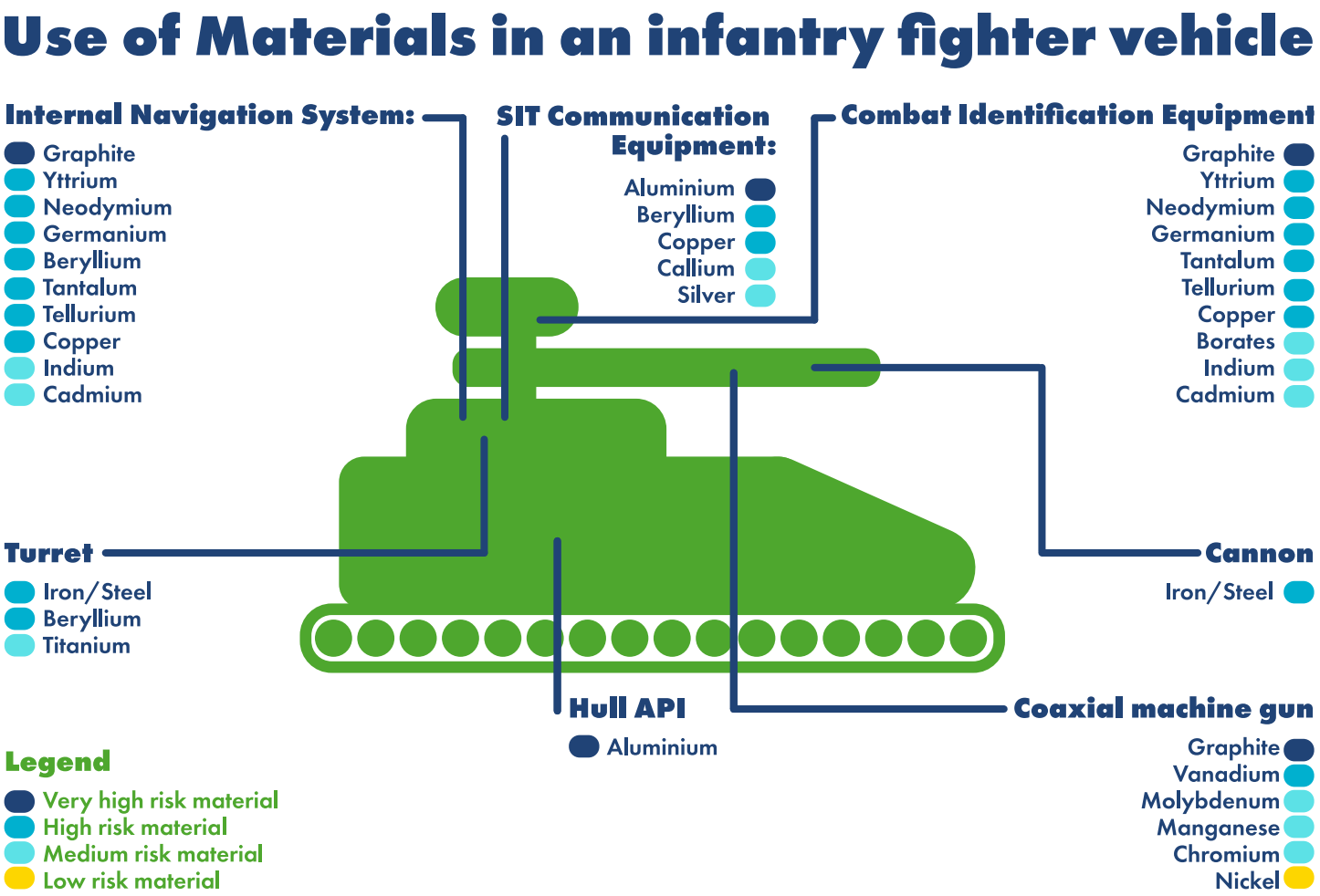

Figure 1: Rare earth elements in an infantry fighting vehicle [A reworked copy of https://hcss.nl/wp-content/uploads/2023/01/Strategic-Raw-Materials-for-Defence-HCSS-2023-V2.pdf]

4. Assessing Europe's Growing REEs Awareness and Its Current Risk Points

Over the past decade, Europe has gradually reframed its REEs narrative from predominantly economic into a more strategic one. Earlier policy frameworks, most notably the 2008 Raw Materials Initiative, approached critical materials primarily through industrial competitiveness, renewable energy, and technological innovation, with no explicit reference to defence or security considerations (European Commission, 2008). This perspective has shifted markedly in recent years. The 2023 European Critical Raw Materials Act explicitly links secure access to REEs with the resilience of the European Defence Technological and Industrial Base, signalling that material dependency is no longer viewed as solely a trade vulnerability alone, but also a strategic security risk. This framing is reinforced by the ReArm Europe Plan (Readiness 2030), identifying critical raw materials as a prerequisite for sustained defence production and industrial scalability. Despite this increased strategic awareness, Europe's vulnerability in REEs supply chains persists and is driven by four main risk factors (IEA, 2023). First, dependence on China remains overwhelming, particularly in midstream processing and separation, where Chinese firms dominate global capacity (Kalantzakos, 2017a). Beijing's export controls on REEs processing technologies further worsen this position by restricting the transfer of know-how and equipment necessary to replicate refining capabilities. As a consequence, even if ore is sourced elsewhere, it still tends to pass through Chinese-controlled refining, creating a structural bottleneck that diversification alone cannot fix. Second, developing domestic REEs industrial capabilities is inherently time-consuming. Even under favourable conditions, the progression from geological exploration to commercial production typically spans a decade or more. Processing and separation facilities face similarly extended timelines, driven by technological complexity, high capital requirements, and the intensive use of financial, technical, and regulatory resources (Baskaran & Schwartz, 2025c).

Third, regulatory environmental policies within Europe significantly slow project development, raise costs, and deter private investment. Processing and separation are environmentally unfriendly and expensive (Han et al., 2025), while market prices are volatile and often insufficient to offset these high upfront costs. Fourth, alternative suppliers remain limited. Even close partners such as the United States, Australia, and Japan face their own capacity constraints, processing bottlenecks, and growing domestic demand pressures. Consequently, expanding cooperation on REEs with other countries does not automatically eliminate vulnerability, as structural concentration and strategic inertia persist.

5. Strategies Forward: Onshoring, Nearshoring, and Allied Shoring

Having outlined the principal risks, this paper now turns to a discussion of potential pathways for addressing them, including onshoring, nearshoring, and allied shoring (Savoy, 2023). Applied to the European context, these categories help clarify feasible policy options in the context of existing geological, regulatory, and political constraints.

REEs:
Contrary to common belief, REEs are not scarce. Their perceived "rarity" stems instead from the difficulty and cost of extracting, separating, and refining them into usable metals.

5.1 Onshoring

Onshoring refers to the development of domestic REEs capabilities across the value chain, encompassing extraction, processing, refining, recycling, and downstream manufacturing (Savoy, 2023). While full self-sufficiency is neither realistic nor necessary, onshoring remains indispensable for reducing Europe's exposure to strategic chokepoints, particularly in midstream processing and separation, where Chinese dominance is most acute.In practice, Europe's potential for large-scale onshoring at the extraction stage is constrained by geological, environmental, and political factors. Although REEs deposits exist across several member states, their scale is modest and their exploitation often politically sensitive. The discovery of a potentially significant deposit near Kiruna in northern Sweden illustrates both the opportunities and the limitations of this approach (LKAB, 2025). While the find has generated optimism, geological assessments remain ongoing, permitting timelines are lengthy, and substantial infrastructure investment would be required before commercial extraction could begin. Even if fully developed, Kiruna would not materially offset Europe's overall import dependence. Consequently, Europe's most realistic onshoring opportunities lie further downstream in the value chane, like processing, refining, recycling, and magnet manufacturing. Investment in midstream facilities would reduce Europe's exposure to processing bottlenecks, while the development of recycling and reverse-logistics systems could gradually lower net import dependence (Kalantzakos, 2017a; McNulty et al., 2022). Technological innovation can partially complement these efforts. Research into low-rare-earth or rare-earth-free permanent magnets seeks to reduce material intensity without sacrificing performance (Andrews-Speed & Hove, 2023). Similar trends are visible in the private sector, for example in the automotive industry (Ewing, 2025), where manufacturers increasingly aim to minimise REEs use in electric motors and power electronics. While such substitution cannot eliminate demand for REEs altogether, it can reduce pressure on the most constrained elements and enhance overall system resilience. The economic dimension of onshoring remains the most binding constraint. Due to high capital intensity, environmental compliance costs, and exposure to volatile global prices, market forces alone are insufficient to sustain domestic REE capacity. As a result, policymakers increasingly rely on price-stabilisation mechanisms, long-term offtake agreements, and direct state involvement to de-risk investment. The United States has recently introduced price-floor mechanisms to support its domestic REEs producer and shield it from market volatility (Scheyder & Renshaw, 2025).

In parallel, private actors have begun to anchor demand through long-term commitments: Apple, for example, has pledged approximately USD 500 million to support domestic REEs processing and recycling through offtake and investment agreements (Apple, 2025). Taken together, these cases illustrate that effective onshoring requires a whole-of-chain and whole-of-government approach. Focusing narrowly on mining risks shifting dependency to other stages of the value chain. While onshoring will be time-consuming and costly, targeted investment in midstream processing, recycling, and downstream manufacturing can meaningfully reduce Europe's exposure to strategic chokepoints. Nevertheless, onshoring alone cannot resolve Europe's REEs challenge, underscoring the need for complementary allied shoring and nearshoring strategies.

> **"Onshoring, allied shoring, and nearshoring, complemented by the appropriate EU-level mechanisms should be understood not as competing alternatives but as complementary instruments."**

5.2 Allied Shoring

Allied shoring involves securing access to REEs through politically viable partners. For Europe, allied shoring represents one of the most immediately available tools for reducing exposure to Chinese supply-chain leverage. Potential measures include joint stockpiling arrangements, shared processing and separation facilities, and coordinated investment frameworks with countries such as Australia, Brazil, South Africa, Japan, Vietnam (Baskaran & Schwartz, 2025b), and Canada (Hernandez-Roy, & Ziemer, 2025). At present and for the foreseeable future, Australia stands out as the most consequential rare-earth supplier, beyond China and the United States. It possesses commercially viable deposits, a stable regulatory environment (Liu et al., 2023), and long-standing political alignment with Europe. Crucially, Australia has also invested in upstream and midstream capacity, including processing and separation. Australia is the largest producer of separated REEs outside of China, including its Lynas Rare Earths (Murphy & Luck, 2025). However, Australia is still dependent on China, especially in oxides refining (Uren, 2023), which is expected to last at least until 2026 (Reuters, 2023). Furthermore, Australia develops its Browns Range to become the first significant dysprosium producer beyond China (Northern Minerals, 2025), but this endeavour still requires a lot of work (Baskaran & Schwartz, 2025b). One of the dangers associated with the allied shoring is a potential risk of increasingly complex supply chains (Choi et al., 2005). In practice, however, this concern is overstated in the REEs context. The global supplier base outside China remains extremely limited, meaning that diversification does not involve managing a large number of alternative suppliers but rather reallocating volumes among a small and geographically concentrated set of producers (Kalantzakos, 2017a; Girardi et al., 2023). The primary trade-off of this path are high costs as multi-sourcing undermines economies of scale and reduces access to the lowest-cost supplier, resulting in higher prices across the value chain (Andrews-Speed & Hove, 2023). Furthermore, without parallel investment in European processing, manufacturing, and recycling, allied shoring risks substituting one concentrated dependency with another, albeit among perhaps more friendly suppliers. Therefore, allied shoring can enhance resilience but cannot fully replace domestic or regional capability development.

5.3 Nearshoring

Lastly, Nearshoring occupies the middle ground between homegrown capabilities and accessing REEs from elsewhere. Europe's neighbourhood, including Ukraine and parts of the Caspian region, holds potential for REEs extraction and processing (Bernard-Pearl, 2024). Developing these links could shorten supply chains and deepen strategic partnerships. In practice, however, nearshoring faces substantial constraints. Many prospective partner regions are characterised by geopolitical volatility, unresolved security risks, and weak or uneven regulatory environments, all of which raise investment costs and complicate long-term planning. Moreover, while extraction potential exists, processing and refining infrastructure is

often absent, meaning that nearshoring risks reproducing dependence on external midstream chokepoints without significant capital investment and technology transfer (Van Wieringen, 2025). Consequently, nearshoring extends beyond industrial policy alone and would require sustained European engagement in infrastructure development, capacity-building, and, in some cases, security assistance, which might also become politically sensitive. As a result, nearshoring should be understood as a medium- to long-term strategy whose feasibility is contingent on broader regional stabilisation and the EU's willingness to assume a more active role in shaping its neighbourhood. When integrated with onshoring and allied shoring, nearshoring can contribute to diversification and resilience; pursued in isolation, however, it cannot deliver secure access to REEs.

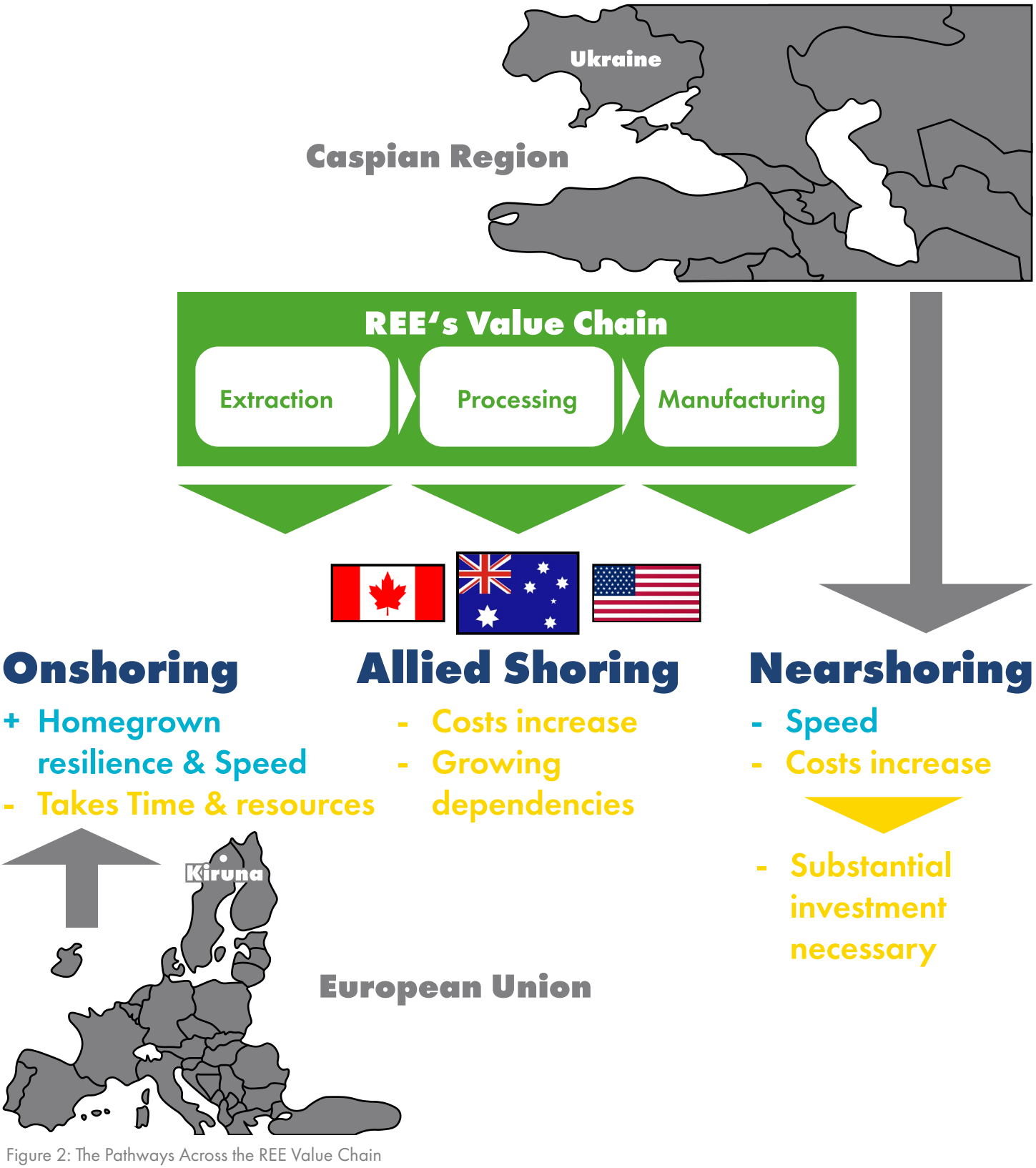

Figure 2: The Pathways Across the REE Value Chain

5.4 From Strategy to Execution

Having discussed the potential pathways to Europe's enhanced REE resilience, one issue remains: How should these be enacted? An effective response requires a division of labour that leverages EU-level scale while preserving national implementation capacity. Several core functions are best addressed collectively at the EU level. Market-shaping instruments, demand aggregation, and long-term risk absorption benefit from scale, credibility, and financial capacity that individual member states struggle to replicate. The European Union has already taken initial steps in this direction. The launch of the European Raw Materials Alliance (ERMA) in 2020 signalled a recognition that fragmented national approaches are insufficient to address structural dependencies in critical raw materials, particularly in magnets and motors (European Commission, 2025). Thanks to convening industry, academia, policymakers, and investors across the value chain, ERMA has a potential of a REEs coordination platform aimed at identifying investment bottlenecks, aligning industrial priorities, and mobilising capital for strategically relevant projects. Japan's experience can offer a useful example that Europe could mirror. Following the 2010 rare earth supply shock, Tokyo adopted a coordinated strategy in which public institutions assumed responsibility for long-term planning and strategic risk absorption, while private actors executed commercial operations (Baskaran & Schwartz, 2025a). Through the Japan Oil, Gas and Metals National Corporation (JOGMEC), the Japanese state provided financing, took equity stakes in overseas projects, underwrote long-term offtake agreements, and established strategic stockpiles, all in close coordination with downstream industry. This approach significantly reduced Japan's dependence on Chinese supplies. A comparable model could be adapted to the European context. At the EU level, institutions such as the European Commission, the European Investment Bank, the European Defence Agency, and PESCO could collectively assume responsibilities analogous to those fulfilled by JOGMEC, building on existing platforms such as ERMA. This would include demand signaling, coordinating long-term offtake agreements for defence- and energy-critical applications, managing joint stockpiles, and co-financing strategically relevant processing, magnet manufacturing, and recycling projects (Baskaran & Schwartz, 2025a). Such EU-level coordination would enhance scale and predictability while preventing duplication and fragmentation across member states. At the same time, it is vital to recognise that member states remain indispensable for implementation. Permitting, environmental regulation, land-use decisions, and public acceptance fall firmly within national competence. National governments are also better positioned to engage directly with domestic industry, provide targeted subsidies, or take selective equity stakes through development banks or sovereign investment vehicles. Rather than centralising all responsibility in Brussels, Europe's challenge lies in aligning EU-level strategic coordination with national execution.

6. Policy Recommendations & Conclusion

Europe's vulnerabilities in the REEs supply chains are not a marginal industrial concern; they are a consequential structural constraint that directly undermines the realisation of its defence ambitions. As such, REEs are best understood as the "vitamins" of modern defence: they are required in small quantities, yet without them, advanced military systems cannot function. No single policy instrument can fully eliminate Europe's REEs dependencies, which warrants a pragmatic and layered policy approach. Over the long term, Europe should prioritise the development of its own REEs capabilities wherever feasible, adopting a whole-of-chain strategy that extends beyond extraction and includes processing, refining, recycling, and downstream manufacturing (Baum, 2025). However, given geological constraints, regulatory hurdles, and high costs, such efforts are unlikely to deliver full self-sufficiency. On the other hand, such efforts could reduce vulnerabilities by mitigating the most acute chokepoints in the value chain and thus strengthen the European defence sector's resilience. During the lengthy and politically constrained process of building domestic capacity, allied shoring offers the most immediately

effective means of addressing urgent supply gaps. Over the short term, cooperation with politically reliable partners, most notably Australia, can enhance supply chain predictability and reduce dependencies on China, albeit at a higher cost. Additionally, nearshoring can accompany allied shoring, but its efficiency remains contingent on broader regional stabilisation, infrastructure development, and sustained EU external engagement, which generates further costs. Crucially, implementing this policy alternatives requires a clear division of responsibility between the European Union and its member states. EU-level coordination, for example through platforms like ERMA, is indispensable for aggregating demand, shaping markets, and providing strategic scale through instruments such as joint purchasing, coordinated stockpiling, and investment frameworks. At the same time, member states remain central to implementation, particularly in permitting, environmental regulation, industrial support, and public acceptance. Onshoring, allied shoring, and nearshoring, underpinned by suitable EU-level mechanisms, are best conceptualised not as rival strategies but as complementary and mutually reinforcing tools. Complete independence from external suppliers is simply not realistic; what matters is ensuring reliable access to the "vitamins" of modern defence. To avoid perpetuating a dependency that undermines resilience, Europe must implement proactive investment frameworks, coordinated industrial policy, and strategic cooperation with trusted partners. Even if full REEs autonomy remains unattainable, Europe must nonetheless pursue it pragmatically, working within existing structural and resource constraints.

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About the Article

How have international legal norms adapted to the rise of private military and security companies (PMSCs), and with what consequences for accountability? States have responded to PMSCs primarily through soft-law mechanisms that normalise private force while avoiding binding legal responsibility This shift enhances legitimacy and flexibility in security governance but entrenches an accountability gap that weakens international humanitarian law and oversight.

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1. Conceptual foundation

Modern private military contractors trace their roots to a historical reconfiguration of warfare due to the decline of state monopolies on violence after the Cold War. As Avant (2007) and Percy (2007) note, the state's monopoly on violence and armed forces weakened in the 1990s when military downsizing and neoliberal privatisation created both a supply of trained veterans who were open to individual employment and a demand for flexible security solutions that did not fit into the traditional roles and responsibilities of an army. In Russia, for example, parallel developments linked to the post-Soviet security vacuum fostered small military contractors that eventually evolved into the more sophisticated Wagner Group, illustrating how geopolitical and economic shifts jointly generated a "market for force." Thus, the rise of private military companies can be thought of as the market adaptation of an old practice to the logic of contemporary governance. The challenge lies in clarifying precisely what constitutes a Private Military and Security Company (PMSC), as this norm is shrouded in definitional ambiguity, which gives rise to legal and ethical disputes. PMSCs are commercial entities providing military and/or security services for remuneration, encompassing activities from training and logistics to direct combat support (Doswald-Beck, 2007). Analysts further divide them into military provider, consulting, and support firms (Mitchell, 2018). This differentiation highlights that not all PMSCs engage in combat; many deliver non-lethal expertise or infrastructure protection. The European policy community even favours the term "Private Security Company" to distance legitimate firms from the "military" and "mercenary" stigma. Nevertheless, the blurred boundary between armed protection and active participation in hostilities ultimately sustains conceptual instability. Hence, because PMSCs' operational spectrum overlaps with state and army-traditional functions, PMSCs simultaneously challenge and depend on the traditional categories that define lawful force. However, international humanitarian law (IHL) has struggled to accommodate PMSCs within its binary division of combatants and civilians. The Third Geneva Convention and Additional Protocol I grant combatant and prisoner-of-war status only to those formally belonging to a party's armed forces, while civilians enjoy protection unless directly participating in hostilities. As Doswald-Beck (2007) explains, most PMSC personnel do not fit within either of these two categories: they are civilians until they engage in hostilities, at which point they may become unlawful combatants. Article 47 of Protocol I defines "mercenaries" through cumulative criteria, which amount to motivation by private gain, recruitment to fight, and exclusion from official forces. Few contractors meet these conditions, yet the normative association with mercenaries persists, generating thus a moral dislike/hesitance towards PMSCs (Percy, 2007). The result is a legal grey zone in which private contractors operate lawfully only by virtue of narrow interpretation. In response to this legal ambiguity, states and non-state actors alike have pursued a "soft-law" mechanism to lend oversight and legitimacy to private contractors. Lacking consensus on a binding international treaty, regulation has been undertaken by multi-stakeholder initiatives that merge governmental, corporate, and civil society participation. For example, the Montreux Document (2008) articulates existing legal obligations and best practices for contracting, territorial, and home states without creating new law. The International Code of Conduct for Private Security Providers (ICoC) (2010) and its oversight body, the ICoC Association (ICoCA) – of which the United States are a member –institutionalised self-regulation, committing signatory PMSCs to respect human rights and IHL (Mitchell, 2018; Prem, 2021). These frameworks have rebranded the PMSC industry into responsible and legitimate "private security" services. Thus, they have become partially normalised within the global security government.

2. Moral and normative challenges

The ethical ambiguity around PMSCs, however, persists because they inherit a moral stigma that was historically attached to mercenaries. Historically, the use of violence

was a public duty exercised by sovereign-enabled individuals; fighting for pay rather than principle was seen as morally corrupt, thus explaining the emergence of an anti-mercenary norm. Percy (2007) traces this anti-mercenary norm to Enlightenment ideals of civic virtue and national loyalty, which condemned profit-motivated warfare as incompatible with legitimate authority. Although modern PMSCs emphasise professionalism and corporate accountability, they remain entrepreneurs of violence (Percy, 2007), motivated by financial rather than patriotic imperatives. This inherited stigma explains why international debates still equate PMSCs with "dogs of war," making evident how moral attributions, rather than legal definition alone, sustain a normative unease regarding the privatisation of armed force.

PMSC	Revenue (last ~10 years)	Funding (last ~10 years)	Most recent conflict: revenue/funding signal
Wagner Group	No audited public revenue (opaque network; often not a single legal entity).	Russian state payments acknowledged: Putin said the Russian state paid "more than 86 billion rubles" to Wagner from May 2022 to May 2023	Ukraine
		Resource-concession model (Syria): Prigozhin-linked Evro Polis contracts reportedly gave 25% of oil/gas proceeds from fields it helped capture/protect.	Syria
DynCorp International	2018 revenue ~ $2.1B (trade/industry ranking data).	Funding overwhelmingly via U.S. government contracts (payments for services). (DynCorp historically reported very high dependence on federal contracts; exact share varies by year.)	Afghanistan/Iraq drawdown era: revenue reflects continuing U.S. contracted support/training/logistics in the 2010s
Blackwater -> Xe Services ->Academi -> (part of) Constellis	Constellis annual revenue is stated as ~$1.5B (press release, 2017).	Funding primarily via U.S. government contracts (State/DoD and others), though a segment-by-segment breakdown is not always public.	Iraq/Afghanistan: the most defensible "recent" quantitative indicators are Constellis-level revenue and later contract awards (awards ≠ revenue).
Blackwater (before Constellis)	-	-	Iraq (mid-2000s): State Dept paid >$832M (2004–2006) for Iraq security work.

Table 1: Revenues, funding, and notable conflict presence for the three best-known PMSCs.

To overcome their reputational deficit, PMSCs have sought legitimacy through the construction of a professional and legal identity (Mitchell, 2018). Following scandals such as the 2007 Nisour Square massacre by Blackwater (wherein 17 civilians were killed by Blackwater operatives), PMSCs faced intense public backlash. These crises spurred internal reforms, adoption of human rights codes, and participation in initiatives like the ICoC and the Montreux Document (Mitchell, 2018). Through such engagement, PMSCs attempt to project moral rectitude and to rebrand from "mercenaries" to "private professionals," thus reframing themselves as responsible security providers integrated into global governance. The central normative problem is that existing accountability mechanisms rely on voluntary compliance rather than enforceable obligations. Prem (2021) describes multi-stakeholder initiatives as arenas of soft-law governance, where rules emerge from negotiation among states, private corporations, and NGOs instead of formal treaties. While these initiatives improve transparency, they reproduce power asymmetries: Western states and Western-based firms dominate the creation of rules and norms, while civil society and Global South perspectives remain marginal. As a result, the regulatory architecture privileges reputational legitimacy over substantive legal control. Doswald-Beck (2007) notes that when PMSCSs violate IHL, either by directly participating in hostilities or by mistreating detainees, responsibility is difficult to assign because states disclaim direct command. Thus, soft-law instruments mitigate reputational risk but fail to ensure legal accountability. Furthermore, delegating coercive power to private actors risks exacerbating existing conflicts and undermining humanitarian restraint. Empirical research by Lees and Petersohn (2023) shows that state reliance on PMSCs correlates with increased conflict severity, especially when contractors supply rather than merely support regular troops with training. By externalising violence, governments reduce domestic political accountability for casualties and collateral damage. Mitchell (2018) further observes that contractors often operate within ambiguous command chains, complicating investigations into civilian harm. Outsourcing violence, therefore, produces an ethical paradox: while intended to enhance efficiency, it erodes the very norms that underpin humanitarian conduct in war, so proportionality of violence and responsibility. Lastly, the normalisation of PMSCs signals a broader transformation in global norms governing legitimate force. Normative evolution occurs when repeated practice reshapes expectations about what is lawful or appropriate in international behaviour (Prem, 2021). As PMSCs participate in self-regulatory regimes and state contracts, they acquire a quasi-institutional status within international security governance. Their presence in UN, NATO, and EU operations demonstrates that the privatisation of force has moved from exception to routine. However, this normalisation, achieved through legitimacy-seeking and soft-law coordination, masks the persistence of weak accountability. The moral trajectory of PMSCs thus reflects the ambivalence of the contemporary international order – one that privileges efficiency and flexibility at the expense of the ethical boundaries of warfare.

Private Military and Security Company (PMSC):
A commercial entity that provides military or security services for profit, ranging from training and logistics to armed protection and combat support.

3. PMSCs in security sector reforms

PMSCs have become increasingly employed instruments in post-conflict reconstruction in weak states and transitioning states, often supplying the expertise that these states lack. Efforts to rebuild effective, accountable, and democratic security institutions after conflict are all part of security sector reforms (SSR), which are a central part of peace-building strategies. Krahmann (2007) documents how firms (see DynCorp) were contracted in Iraq, Afghanistan, and Liberia to train police and military forces, supply logistics, and rehabilitate defence infrastructure. These

private companies filled capacity gaps in the host-state institutions, which were non-functional, with the rapid deployment of trained personnel and technical resources. Their integration within SSR reflected Western priorities for quick stabilisation with minimal national troop commitments. Thus, PMSCs can fulfil the role of pragmatic tools in the implementation of SSR, extending international reach while reducing political and operational costs for donor states. However, while PMSCs enhance the efficiency of rebuilding efforts, their commercial logic can undermine the long-term legitimacy and sustainability of local security institutions. This is because effective SSR depends on national ownership and public trust; privatisation introduces market incentives that may conflict with these goals. Contractors, motivated by profit and short-term deliverables, often prioritise rapid training outputs over institutional depth (Krahmann, 2007). In Liberia and Afghanistan, for example, externally managed police programs led to dependency on foreign trainers and equipment supplied by PMSCs rather than autonomous, self-sufficient forces. Contracts are given by donors, not by domestic authorities; hence, accountability is a matter of pleasing the sponsors rather than securing the lives of the citizens. The outsourcing of SSR, therefore, risks substituting domestic legitimacy with external capacity, recreating instability once international support ends. The European Union's use of PMSCs is an example of the structurally incorporated privatisation of supranational security governance. Bátora and Koníková (2025) describe the EU as an enmeshed security and defence actor, meaning that it fuses public mandates with private implementation networks. In Common Security and Defence Policy (CSDP) missions (see EUBAM Libya), the EU contracts private firms for protection, logistics, and advisory tasks (Bures & Cusumano, 2025). This reliance arises from political and bureaucratic constraints among member states that limit the deployment of EU personnel. Private contractors enable Brussels to sustain missions without full military consensus, but they also obscure lines of accountability since the EU lacks a binding legal regime equivalent to the Montreux Document. Thus, the use of PMSCs by the EU is indicative of a trend within which PMSCs transform from peripheral suppliers to active core operational partners. Interestingly, the increasing participation of PMSCs in global governance initiatives is leading PMSCs to frame themselves as legitimate partners in SSR and peacebuilding. Mitchell (2018) and Prem (2021) conceptualise this strategy as legitimacy-seeking within multi-stakeholder initiatives (MSIs) that merge state, corporate, and civil-society roles, by signing the ICoC and engaging with the ICoCA, PMSCs posture compliance with humanitarian standards as evidence of corporate responsibility. These initiatives, though voluntary, provide social recognition and contractual advantages in SSR. Participation allows firms to reposition themselves from "mercenaries" to "partners in governance," influencing how SSR norms are interpreted and applied. In this way, PMSCs manage to capitalise on their ethical vulnerability in order to embed themselves within a new normative oversight framework. Thus, the challenge for contemporary SSR lies in reconciling its operational utility with the need for democratic oversight. This oversight, especially in the matter of SSR, is constituted through legal responsibility, transparency of contracts, and respect for the host state's sovereignty. However, states often treat PMSC compliance as a matter of corporate auditing rather than public law (Prem, 2021). Meanwhile, host governments rarely possess the leverage to monitor foreign contractors. The result is what Krahmann (2007) terms "governance without government," where reform proceeds through private expertise rather than public authority. Hence, sustainable SSR requires moving beyond functional outsourcing toward frameworks that ensure political accountability, integrating PMSCs into the rule of law they help rebuild.

4. Cases of PMSCs and their legal applications

PMSC	State employers	Countries active	Operation types by country
Wagner Group	Russia	Ukraine; Syria; Mali; CAR; (also reported: Libya, Sudan, Mozambique, etc.)	Ukraine: frontline combat support. Syria: combat + oil/gas field security tied to revenue-share.
	Syria under the Assad government	Syria	Syria: "recover/protect" energy assets <-> share of proceeds (resource-backed contracting).
DynCorp International	United States	Afghanistan; Iraq; Colombia (and other counternarcotics theatres); plus various global support posts	Afghanistan/Iraq: training + logistics/aviation support for U.S./host-state forces (contract support model). Colombia: aviation/counternarcotics support
Blackwater/ Academi/ Constellis	United States	Iraq; Afghanistan (core), plus global protective services footprint under Constellis contracts.	Iraq/Afghanistan: armed diplomatic security / protective services; training

Table 2:State employer, country of deployment, and operation type of the three best-known PMSCs.

5. EUBAM Libya

The EU's deployment of PMSCs in Libya demonstrates how international legal norms governing private force are acknowledged in principle but rarely enforced in practice. Under the Montreux Document (2008), states are categorised as contracting, territorial, or home authorities, each bearing obligations to ensure that PMSCs respect international humanitarian and human-rights law. Bures and Cusumano (2025) show that in the EUBAM Libya mission, the EU contracted multiple PMSCs for protection, logistics, and advisory services. Because EU member states have differing national regulations, oversight was fragmented, producing what these two scholars call a "capability–expectation gap." Similarly, Bátora and Koníková (2025) argue that the EU's reliance on private actors stems less from efficiency than from an institutional deadlock among member states. Although EU contracts referenced the Montreux principles, no binding enforcement mechanism existed to guarantee compliance. The Libyan case illustrates norm diffusion without enforcement: legal standards are symbolically integrated into the design of the mission but remain functionally voluntary, reflecting the limits of soft-law governance.

6. Wagner in Syria and Ukraine

Russia's use of the Wagner Group in Syria and Ukraine exemplifies how states exploit legal ambiguity to conduct hybrid warfare while evading responsibility under international law. This evasion is reminiscent of the concept of "plausible deniability," which refers to conducting operations in such a way that state involvement cannot be legally attributed. Ashraf and Akram (2024) trace

Wagner's evolution from the Slavonic Corps into a transnational enterprise securing Syrian energy infrastructure through contracts with EvroPolis. The company functions simultaneously as a combat arm and an economic agent, fusing military objectives with profit motives. Rizqulloh and Prawira (2024) document Wagner's involvement in torture, executions, and indiscriminate attacks in Ukraine, arguing that its personnel meet the legal definition of mercenaries and unlawful combatants. Despite extensive evidence of IHL violations, prosecutions remain absent because attribution to the Russian state is politically contested. Russia's repeated refusal to legalise PMSCs domestically sustains this ambiguity and allows Moscow to disclaim responsibility for Wagner's battlefield conduct. Foley and Kaunert (2022) describe this model as hybrid surrogate warfare: private forces operating under informal state direction to achieve strategic goals without formal deployment.

> **"The moral trajectory of PMSCs reflects the ambivalence of the contemporary international order – one that privileges efficiency and flexibility at the expense of the ethical boundaries of warfare"**

7. Evolving international legal norms

The rise of PMSCs represents a structural transformation in how international society organises and legitimises the use of force. The post–Cold War environment, characterised by military downsizing, neoliberal privatisation, and global insecurity, generated both the demand for flexible contractors and a supply of professional ex-soldiers (Avant, 2007). PMSCs emerged as market-driven solutions to political and logistical constraints faced by states and international organisations. The international community's response to PMSCs has taken the form of normative evolution rather than the creation of binding law. This normative evolution refers to the incremental reinterpretation of existing rules and expectations through practice, without formal treaty amendment (Prem, 2021). Instruments such as the Montreux Document (2008) and the ICoC (2010) codify best practices and ethical standards for both contracting and host states. Mitchell (2018) and Prem (2021) note that these frameworks institutionalise self-regulation but lack enforcement mechanisms. Nonetheless, their adoption signals the growing social recognition of PMSCs as legitimate participants in international security. However, despite soft-law developments, a persistent accountability gap undermines the effectiveness of international legal norms governing PMSCs. Accountability entails the capacity to identify violations, attribute responsibility, and impose sanctions consistent with IHL (Doswald-Beck, 2007). The case studies confirm this deficit. In Libya, EU oversight relies on contractual compliance rather than judicial enforcement (Bures & Cusumano, 2025). In Syria and Ukraine, Russia's manipulation of legal ambiguity through the Wagner Group shows how state-proxy relationships exploit the absence of clear attribution rules (Ashraf & Akram, 2024; Rizqulloh & Prawira, 2024). Without binding mechanisms or independent adjudication, the distinction between lawful and unlawful conduct becomes contingent on political expediency. Hence, the persistence of impunity for PMSC abuses underscores that norm creation without enforcement cannot substitute for the rule of law. The overarching tension in the evolution of PMSC regulation lies between legitimacy and legality. Whereas legitimacy is concerned with social acceptance and normative justification, legality denotes conformity to binding law (Mitchell, 2018). PMSCs have succeeded in achieving legitimacy through participation in multi-stakeholder initiatives and SSR programs, yet legality lags. Their growing institutional role normalises privatised warfare even as formal law remains ambiguous. As Prem (2021) argues, global security governance increasingly operates through "governance without government," where voluntary compliance substitutes for legal compulsion. The trajectory of PMSCs regulation demonstrates that international law is evolving not by prohibiting private force but by accommodating it. Unless states move from endorsement to enforcement, the governance of PMSCs will continue to present a paradox: legitimate in form, yet legally fragile in substance.

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About the Article

How did Iran build and operates its defence industry? Through the pursuit of defence autarky, reverse engineering, civil-military fusion and dual-use technologies Iran achieved substantial self-reliance in military production, responding to the evolutionary pressure of the sanctions. However this resulted in a deeply unbalanced system, simultanously innovative and obsolete. It directly leads to the adoption of asymmetric warfare doctrine by Iran, which was seriously challanged in 2025.

About the Author

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1. Introduction

The national defence industry can be regarded as a key indicator of state capacity and strategic autonomy. For most countries, military procurement remains deeply embedded in global supply chains, dependent on foreign technologies, licensing and political alliances. This also means varying degrees of external control over a nation's escalation capabilities. Iran, however, stands as a striking exception. It is perhaps the only middle power in the world so thoroughly committed to the pursuit of what can be called defence autarky, meaning a policy of near-total self-reliance and indigenisation in the research, production, and maintenance of military equipment. Regime officials and state news outlets claim that over 90% of military equipment and defence systems used by the Islamic Republic are designed and manufactured inside Iran (Tasmim News Agency, 2025). Even after taking this information with a grain of salt, given its propagandistic value, it is evident that no other country, aside from possibly North Korea, has sought to insulate its defence sector so completely from external dependence. This determination has been driven by both ideology and strategic necessity. The Islamic Republic of Iran was created in the wake of the 1979 Revolution, with one of its main slogans calling for the new order to constitute a third way - neither Western (capitalist), nor Eastern (communist), but Islamic instead. Meanwhile, the Iraq-Iran War (1980-1988), combined with decades of subsequent international sanctions, pushed Tehran towards a policy of defence autarky marked by a paradoxical interplay of isolation and innovation. This resulted in a deeply unbalanced defence industry environment, characterised by both highly obsolete and innovative aspects.

Defence autarky:
a policy of striving for near-total self-reliance and indigenisation of research, production and military equipment maintenance in order to increase the nation's strategic autonomy.

2. Historical Background

The foundations of Iran's defence industry predate the Islamic Revolution. Under the Pahlavi monarchy (1925-1979), the majority of military equipment used by the Imperial Iranian Army consisted of Western munitions. In the 1970s, it was widely considered to be the world's fifth strongest military force. The Shah's mass purchase of the latest American technology then available on the market was estimated in 1979 to be worth between 8 and 10 billion dollars (Branigin, 1979). This means between 34.8 and 44.62 billion US dollars in 2025. The Pahlavi-era defence industry thus focused almost exclusively on maintaining and repairing foreign designs. Despite this, there was already some interest at that time in developing advanced missile systems, foreshadowing later, more intense Iranian endeavours in this domain. This interest was made manifest, for example, by the so-called Project Flower, a joint Israeli-Iranian program, which lasted from 1977 to 1979. Much changed after the Revolution and the overthrow of the Pahlavi Dynasty. Iran became a heavily sanctioned regime, cut off from outside trade and imports. It also waged a brutal 8-year-long war against Saddam Hussein's Iraq, known in Iran as Sacred Defence. It ended only in 1988 and became a founding myth of the Islamic Republic. It can be argued that this isolation worked as the main evolutionary pressure on further development of the Iranian industrial base. Limited access to foreign equipment, replacements, and spare parts during wartime necessitated a complete and urgent reorganisation of the previously import-dependent Iranian armed forces. Instead of crippling Iran's military, Western sanctions became an incentive for defence autarky. The Islamic Republic had to make substantial long-term investments in state-owned

defence industries, enabling the domestic production of everything from small arms and ammunition to rockets, missiles, mines, boats and components needed to keep older systems operational. Those investments continued even after the war, over time creating a highly complex, centralised, and hierarchical defence-industry structure. The modern Iranian defence industry was built on the foundations laid in the Pahlavi era. However, in many respects, the two exist at opposite ends of the spectrum and face opposite problems. One enjoyed extensive budget, was over-reliant on imports, and neglected domestic production, whereas the otherfaces significant resource constraints and lacks access to many modern cutting-edge technologies.

> **"Defence autarky and resulting systemic imbalance of the defence industry essentially necessitate the adoption of the asymmetric warfare doctrine by Iran."**

3. Artesh and IRGC: Major Stakeholders

Most Iranian industries are either fully nationalised or closely connected to either the IRGC (Islamic Revolutionary Guard Corps) or the Iranian military. This is especially true of the defence industry. Unlike most countries, Iran possesses two separate and parallel primary branches of armed forces, each with its own duplicating capabilities and procurement. One of them is the Islamic Republic of Iran Army, commonly known as Artesh, which is the army in the classical sense. The purpose of Artesh is to serve the State as its military and protect national territorial sovereignty. The other branch comprises the Islamic Revolutionary Guard Corps. IRGC is loyal not to the Iranian State, but personally to the Supreme Leader (Rahbar). It is tasked with defending the system and ideology of the Islamic Revolution. The IRGC is the dominant force in the Iranian defence industry and exerts greater influence than the Artesh (McInnis, 2017). IRGC influences or outright controls key programs, such as the indigenous UAV and drone production, missile programs or satellite launchers, and possesses immense political, economic and institutional influence over the whole defence industry. Artesh remains an operational stakeholder with much weaker political influence, primarily dominating the areas of conventional weapons and the maintenance of legacy systems.

4. Defence Industry Structure

The standard structure of the Iranian military-industrial complex resembles a pyramid, on top of which resides the Rahbar. Below him is the Armed Forces General Staff (AFGS), which oversees both branches of the Iranian armed forces and exercises direct operational command over them. Below lies the Ministry of Defence and Armed Forces Logistics (MODAFL). It handles funding and planning. It is also a crucial player in the defence industry, controlling numerous maintenance, manufacturing, and R&D entities. The main example of the last category is Malek Ashtar University of Technology (MUT), which provides the Iranian defence sector with a steady stream of scientists and engineers (McInnis, 2017). MODAFL also oversees several IRGC-related companies, which, due to the IRGC's secretive nature, form an opaque industrial cluster separate from, but partially overlapping with, the rest of the national defence industry.

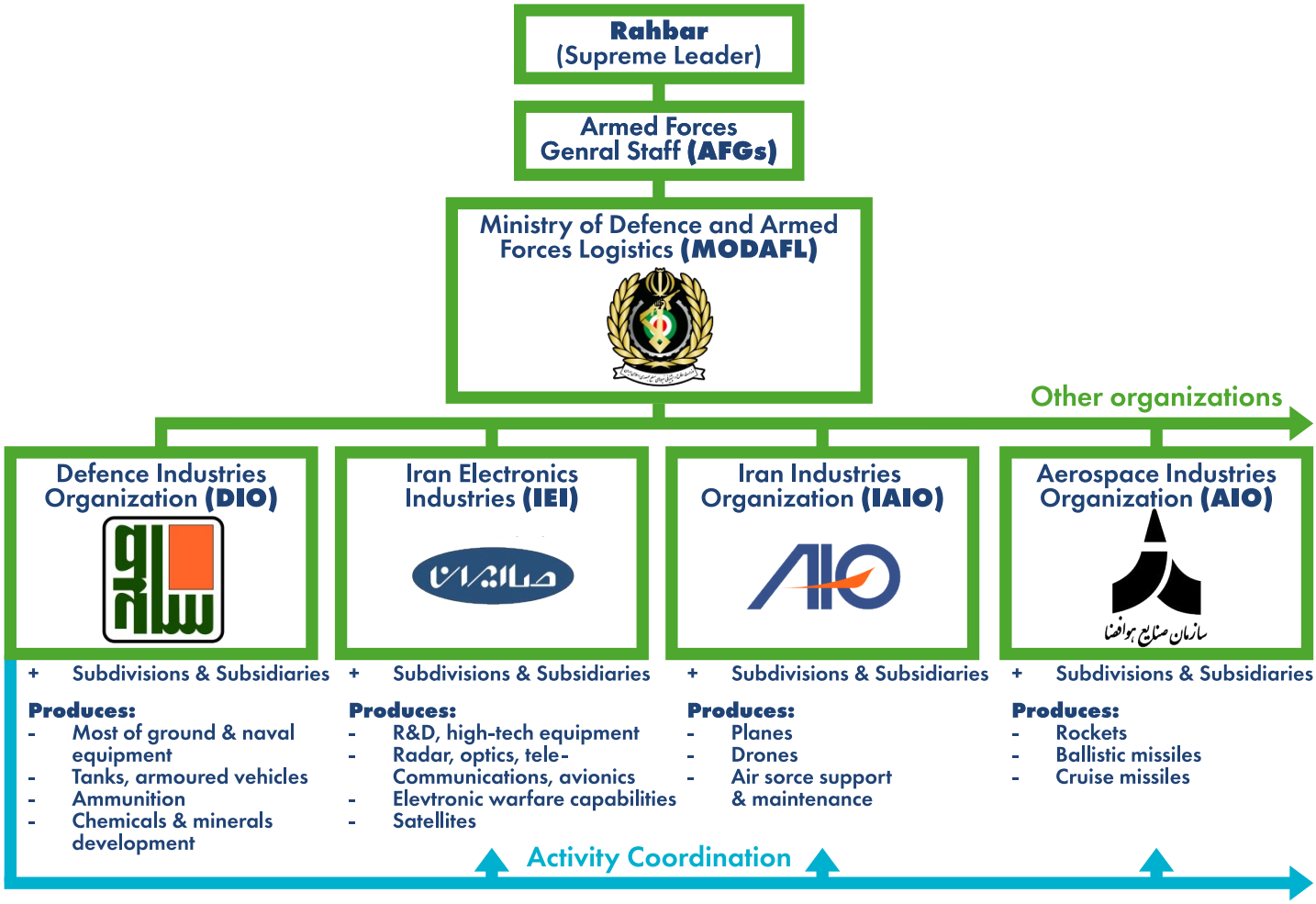

Figure 1: Simplified structure of the Iranian defence industry (Source: Own Work).

There are hundreds of organisations, companies, and research institutions under MODAFL, but four specific subsidiaries can be identified as the major pillars of the Iranian defence industry. The first one is the Defence Industries Organisation. DIO originally served as the chief overseer of the nascent Iranian arms industry under the Shah. Currently, its role remains similar. It is the primary supervisor coordinating the activity of the rest of the system. Over time, DIO involved itself in all military production and R&D, becoming one of the engines of Iranian defence autarky (McInnis, 2017). It is a large conglomerate comprising over 300 smaller companies that produce most of the military equipment and ammunition, and also develop chemicals and minerals for use by the Iranian armed forces. Iran Electronics Industries (IEI) is another important subsidiary of MODAFL. It too originates from a Pahlavi-era company. Since then, IEI has evolved into a powerful conglomerate specialising in the production of high-tech equipment, including radar, satellites, telecommunications, avionics, and electronic warfare systems. It is also one of the main R&D investors. IEI established joint research centres in cooperation with at least 14 Iranian universities. The Iran Aviation Industries Organisation (IAIO) is responsible for planning and managing Iran's military aviation industry. Its subsidiaries produce aircraft, develop the Iranian drone industry, and are responsible for the particularly impressive feat of keeping legacy Cold War designs operational, such as the American F-4 Phantom fighter jet. The final pillar of the Iranian defence industry is the Aerospace Industries Organisation (AIO). It is the youngest of the four, established around 1998 and without any prior Pahlavi predecessor. It specialises in the production of rockets, ballistic missiles, and cruise missiles. It is also one of the most obscure major organisations under MODAFL, which can be explained by the strategic importance of long-range missile capabilities for Tehran. AIO is also one of the entities most targeted by Western sanctions due to its role in enabling possible nuclear proliferation.

5. Coping Under Sanctions

The Islamic Republic's defence industry thus differs significantly from models more familiar to Western observers. It is not a traditional market with competing private contractors, but a vertical, state-managed yet overlapping industrial complex composed of multiple specialised conglomerates. They form a near-complete internal supply chain, from materials to final assembly, thereby reducing dependence on external imports. To avoid a single point of failure, key sectors are geographically spread out. Arms factories are often located underground or even abroad (Iran International, 2025). Detailed information on the possible locations of those factories is scarce due to their confidential military status. Some sources claim that factories are located in the territories of Iran's proxies and neighbouring Iraq (Kalev, 2025). However, there are also reports of their presence in countries such as Tajikistan, Russia, and Belarus (Jhaveri et al., 2023), as well as in Venezuela (Caruzo, 2025).



Figure 2: Map of possible locations of Iranian military factories abroad (Source: Own Work).

This drive for self-sufficiency was enabled by the systematic reverse engineering of captured, purchased, or otherwise acquired foreign equipment, which is one of Iran's main methods of technology acquisition. Foreign blueprints or parts are then localised and indigenously produced as new Iranian designs. For example, most Iranian ASCMs are based on reverse-engineered Chinese C802 missiles; the Zulfiqar tank is based on the Brazilian Engesa Osorio; and the Ya Zahra 3 short-range air defence system is a reverse-engineered and upgraded version of the French Crotale. In contrast, Shahed-171 and related drone designs are based on the American Lockheed Martin RQ-170 captured in Iran in 2011 (Gawęda, 2021). Another way the Iranian defence industry operates is through the integration of civilian and military sectors, as well as the introduction of dual-use technologies. In many ways, Iran was an early innovator in the area of defence integration into civilian sectors. Multiple universities collaborate closely with the IRGC and the Artesh, providing materials, composites, programming, and scientific staff. The automotive industry is similarly connected to the defence sector. SAIPA and Iran Khodro, two Iranian companies that dominate the market and produce the vast majority of cars in the country, have close ties with MODAFL and its subsidiaries, which provide the armed forces with necessary industrial machinery, engines, and metallurgical capabilities (Ghasseminejad, 2020). Iranian oppositional groups have even claimed that the IRGC in fact

controls the automotive industry, connecting it to the opaque cluster of IRGC-related companies (Hakamian, 2024). Khatam-al Anbiya Construction Headquarters is another example of the civil-military fusion. It is an IRGC-controlled engineering company that serves as Iran's primary contractor for large-scale civil and military engineering projects. Khatam-al Anbiya constructs roads and dams, water, oil, and gas pipelines, and is involved in mining, agriculture, and telecommunications projects, but is also the prime contractor for Iran's ballistic missile and nuclear programs (Iran Watch, 2023). The IRGC can also use Khatam al-Anbiya to finance defence projects outside the official budget and to import technology via shell companies, thereby bypassing the financial restrictions imposed by sanctions. Moreover, despite sanctions and the resulting isolation on the international stage, Iran has never been completely cut off from the outside world. It maintains ties with countries like North Korea, China, Russia, Venezuela, Iraq, Yemen, Lebanon, Libya, and Syria (especially during the Gaddafi and Assad regimes). This has allowed Iranian authorities to bypass Western restrictions, engage in limited imports and even test their designs in real combat environments through regional proxies. This cooperation among detractors of American hegemony is one reason for the success of the Iranian missile sector, which has become the most praised component of the entire defence industry. After the devastating experience of Iraqi ballistic and chemical bombardment during the Iraq-Iran War, DIO reached out to Syria, Libya, North Korea and China to acquire missile components and chemical capabilities. Cooperation with North Korea proved especially profitable (McInnis, 2017). Significant components of Iranian long-range ballistic missiles rely on North Korean designs, despite decades of subsequent indigenisation and domestic development. In recent years, Iran has also begun exporting military equipment abroad. This is the case especially in the area of Iranian military drones. Shahed 136 drones exported to Russia play an important role in the Russian invasion of Ukraine. Other Iranian exports have reached Ethiopia, Bolivia, Venezuela, and Western Sahara (Citrinowicz, 2024) and are also used by the Sudanese Armed Forces (SAF) during the ongoing Sudanese Civil War (Tyson, 2025). This provided a significant revenue stream for the Iranian regime. UN sanctions on Iranian military exports were reaffirmed in September 2025, but their impact is yet to be assessed.

6. System of Imbalance

Despite those successes, the doctrinal focus on defence autarky is not without high costs or lasting consequences. Iran lacks the resources and economic capacity necessary to support a modern, fully self-reliant industry. This forces Tehran to specialise and prioritise certain areas, thereby creating a structurally imbalanced system. Different industries and segments of the military possess different levels of capability. Many conventional sectors, such as artillery, tanks, armoured personnel carriers, and general infantry forces, remain underfunded and underinvested in. Others are completely obsolete. The Iranian air force, once the pride of the Pahlavi military, has to rely on outdated machines which require regular cannibalisation of spare parts to keep planes operational. A similar situation occurs in the Navy. The Artesh's fleet is small and composed mostly of ageing corvettes, frigates and warships. Naval forces of the IRGC, however, present the opposite side of the coin. Major Iranian investments go into unconventional, asymmetric, cost-effective, or even makeshift solutions, and these are the areas in which the Islamic Republic's defence industry excels. The IRGC possesses a large navy composed of relatively cheap, mass-produced, and fast attack boats designed for guerrilla warfare. Iranian authorities have, for decades, invested heavily in missile procurement, production, and development, acquiring a largely indigenous long-range missile arsenal, including designs such as the hypersonic Fattah-1 and Fattah-2 (Pierce, 2025). The drone sector is another strong point for Iran. Tehran can be considered one of the foremost global innovators in drone warfare, with the low-cost and easily manufacturable Shahed drones being the most famous example of Iranian expertise in this domain. This system of imbalance in the Iranian defence industry is important because it at least partially explains many of Tehran's strategic decisions in recent decades.

7. Asymmetric Warfare as a Consequence of Defence Autarky

Defence autarky and resulting systemic imbalance of the defence industry essentially necessitate the adoption of the asymmetric warfare doctrine by Iran. The state has limited resources, is partially isolated, and is under constant pressure from sanctions. It operates in a challenging geopolitical environment, while its rivals are typically stronger in conventional terms. This incentivises Tehran to seek ways of subverting the equation. The strategy pursued by Iran since the turn of the 21st century, known as the Axis of Resistance, is an excellent example of this approach. The Axis of Resistance is a broad coalition of militias and political organisations that serves as allies and proxies of Iran in regional conflicts against Tehran's enemies. It consists of multiple non-state organisations in Lebanon, Jordan, Bahrain and Afghanistan, Palestinian and Iraqi armed groups and even de facto state actors, such as the Houthis ruling northern Yemen or, until his downfall, the Bashar al-Assad regime in Syria (Steinberg, 2021). The logic behind the Axis of Resistance is that through the use of its regional proxies, Iran can surround, tie down and harass US and Israeli forces without entering into a confrontation. The proxies can be armed with Iranian arms, especially drones and rockets, while the arsenal of long-range missiles serves as a deterrence against attacks on Iran itself. This way, Tehran can utilise all the assets provided by its defence industry. However, the fact that the IRGC is the primary stakeholder in the Iranian defence industry, while the Axis of Resistance is also mainly an IRGC project, creates a certain vicious circle. Sanctions and the Iraq-Iran War led to the pursuit of defence autarchy, which made Iran, and especially the IRGC, adopt an asymmetric warfare doctrine. IRGC control over the defence industry now reinforces defence autarky and uneven specialisation of the defence industry, creating a self-strengthening feedback loop. This raises questions about potential flexibility and Iran's ability to adapt to sudden changes in conditions, such as those that occurred in the Middle East in 2025.

8. Conclusions

The Iranian defence industry is a unique case of sustained, decades-long pursuit of defence autarky. Tehran achieved substantial self-reliance in military production, maintenance, and R&D, successfully developing its defence industry under the evolutionary pressure of sanctions. This, however, produced a deeply uneven defence sector, simultaneously obsolete and immensely innovative. Many armed forces branches suffer from a chronic lack of funding and outdated equipment, while cost-effective, out-of-the-box solutions have led to the proliferation of asymmetric capabilities and new technologies. This systemic imbalance is a key factor shaping broader Iranian strategic doctrine, as evidenced by the case of the Axis of Resistance. For decades, it served as the primary instrument of Iranian influence in the Middle East, although it has recently faced significant setbacks. The war in Gaza, the fall of the Ba'athist regime in Syria and the so-called Twelve-Day War between Israel and Iran in June 2025 shook the Axis of Resistance, representing a crisis of Iranian grand strategy. The war with Israel and later events are also a great trial for the Iranian defence industry. Due to the complexity of the topic, however, an analysis of its effectiveness in light of recent conflicts requires a separate article.

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About the Article

Hybrid security regimes are not symptoms of institutional weakness but deliberate political strategies. Hybrid security regimes are used to enhance flexibility and extend the reach of state-aligned coercive practices. In hybrid security regimes, sovereignty is seemingly exercised not only through formal hierarchies but through shifting, relational, and often opaque networks of authority.

About the Author

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1. Conceptualising Hybrid Sovereignty and Hybrid Security Regimes

As the contemporary security landscape becomes increasingly blurred—collapsing distinctions between state and non-state actors, public and private sovereignty, and even war and peace—it has given rise to what many scholars describe as hybrid security regimes, where coercive power is shared among formal institutions, informal networks, private intermediaries, and ideologically aligned auxiliaries operating in flexible and overlapping ways (Luckham & Kirk, 2013; Schroeder et al., 2014; Lawrence, 2017; Stojanović & Pavlović, 2021). In these systems, sovereignty is seemingly exercised not only through formal hierarchies but through shifting, relational, and often opaque networks of authority.

Swati Srivastava's conceptualisation of "hybrid sovereignty" captures this dynamic well, demonstrating how the state's supposedly indivisible authority coexists with highly divisible practices of governance enacted by state and nonstate actors (Srivastava, 2022). Viewed through this lens, hybrid security regimes can be described not simply by the presence of multiple coercive actors but by how they are orchestrated within the state's coercive architecture, particularly through ambiguity, deniability, and institutional layering that expand executive authority while minimising political, legal, and diplomatic constraints.

Building on this conceptual foundation, in what follows, I will briefly analyse the emerging hybrid security regimes of Russia and Turkey as two illustrative contexts that provide a rich backdrop for examining the interplay between formal and informal coercive structures and the fragmentation and strategic orchestration of authority. Given the breadth of the phenomenon, I will focus specifically on each state's relationship with private military companies (the Wagner Group in Russia and SADAT Defence in Turkey) as analytical entry points into their respective hybrid security configurations.

2. Russia: Patronage, Informality, and Hybrid Coercive Power

Russia's hybrid security architecture is best understood through the broader political ecology that emerged in the early 2000s, when Vladimir Putin began orchestrating a system in which formal institutions operate alongside informal patronage networks and personalised loyalties. Within this ecology, the official security services—most notably the FSB, SVR, GRU, and other branches of siloviki—occupy a dominant role, exerting influence that far exceeds their bureaucratic remit. As existing research bluntly demonstrates, their activities routinely intersect with business interests, political elites, and irregular armed formations, allowing the Kremlin to advance strategic aims while preserving deniability (Goode, 2010; Taylor, 2011; Meakins, 2018; Gomza, 2023). As Potočňák and Mareš succinctly note, in this hybrid system, "[...] all significant businesses [...] do business as usual, but they are also willing and prepared to be summoned by the state authorities any time and for any specific reason" (Potočňák & Mareš, 2022, p. 188). The system's effectiveness thus stems not only from the dense entanglement of formal agencies and informal coercive networks operating under, alongside, or even against official structures, but also from its capacity to swiftly neutralise any individual or entity that challenges its boundaries. The rise and fall of the Wagner Group provides the most vivid contemporary illustration of this hybrid dynamic. Between 2014 and 2023, Wagner emerged as a key instrument of Russian power projection in Africa, the Middle East, and Ukraine, largely facilitated by the close alignment of interests among Vladimir Putin (the ruling elite), Dmitry Utkin (a GRU-affiliated intelligence officer), and Yevgeny Prigozhin (a business oligarch) (Bellingcat, 2020; House of Commons Foreign Affairs Committee, 2023). When this alignment collapsed in early 2023 over Prigozhin's dispute with military leaders over the war in Ukraine, it revealed the vulnerability

of this patronage-driven model (lacking legal foundations) to the rapid removal of non-compliant actors (Has, 2025). The result was the controversial 23 August 2023 plane crash that killed Wagner leaders and the incorporation of its forces into the Defence Ministry as Africa Corps (Al Jazeera, 2023). These patterns make clear that Russia's hybrid security regime is not a by-product of institutional weakness, but a deliberate strategy for sustaining personalised rule. By dispersing coercive power across opaque networks of security elites, business patrons, and irregular armed actors, the Kremlin appears to maintain flexibility while evading responsibility for violence carried out in its name. The abrupt dismantling of Wagner underscores how this system ultimately operates as a hierarchy of loyalty, where actors exist only so long as they serve executive interests and disappear the moment they cease to be useful.

3. Turkey: Ideological Framing and the Reconfiguration of Security Governance

Parallel to Russia's early-2000s political reconfiguration, Turkey entered its own period of transformation during the same decade. With the rise of the Justice and Development Party (AKP) in 2002, the long-dominant military bureaucracy was gradually weakened and replaced by a more centralised and executive-driven security structure shaped by President Recep Tayyip Erdoğan (Sözen, 2010; Cop & Zihnioğlu, 2017; Oğuzlu, 2022). The failed 2016 coup further accelerated this process, allowing the presidency to consolidate control over the armed forces and the National Intelligence Service (MIT) and to construct networks of defence-industry actors (such as ASELSAN, ROKETSAN, BAYKAR) and private military companies (such as Akademi Sancak, SADAT Defence) that became extensions of Turkey's hybridised strategic identity (Intelligence Online, 2018; Bastian, 2024; Jaklin, 2024; Seren, 2025). Nevertheless, unlike Russia's reliance on covert informality, Turkey's hybrid security configuration operates openly while remaining strategically ambiguous, drawing coherence as much from ideology as from institutional design. Neo-Ottoman, nationalist, and Islamist-conservative themes have played a particular role in shaping this vision. The state's engagement with SADAT Defence illustrates how such ideological frames become operationalised within the country's hybrid security governance. SADAT's ideological proximity to the AKP largely emerges from overlapping discourses of Islamic conservatism, military resurgence among Muslim states, and neo-Ottoman strategic imaginaries (SADAT, n.d.; Has, 2025). The appointment of SADAT founder Adnan Tanrıverdi as Erdoğan's chief military adviser after the 2016 coup marked the integration of this explicitly Islamist-nationalist worldview into the state's security apparatus. During Tanrıverdi's tenure from 2016 to 2020, various reports alleged that SADAT provided training and logistical assistance to armed groups in Syria, Libya, and Nagorno-Karabakh, suggesting a role in extending Ankara's ideologically driven hybrid security posture into several conflict theatres (Spyer, 2018; Department of Defense Office of Inspector General, 2020; Powers, 2021). SADAT's role within this architecture thus provides a window into the deeper logic of Turkey's hybrid security model, one in which ideological alignment becomes a means of structuring coercive capacity beyond formal institutions. Seen in this broader frame, Turkey's trajectory demonstrates how hybrid security governance can serve as a tool for deepening authoritarian control. By dismantling the autonomy of formal coercive institutions and replacing them with networks of defence-industry partners and ideologically driven auxiliaries, the regime has seemingly created a multilayered coercive apparatus that operates both within and beyond the state.

4. Conclusion

Viewed through the lens of hybrid sovereignty, Russia and Turkey illustrate how contemporary states renegotiate coercive authority across multiple institutional and informal domains. While Russia exemplifies a model in which informal patronage networks, security elites, and deniable armed actors are deliberately mobilised to sustain personalised rule, Turkey illustrates how ideology can be used to legitimise similar hybrid arrangements operating

openly yet with strategically ambiguous boundaries. Within this landscape, actors such as Wagner and SADAT Defence appear to function as integral components of each state's broader hybrid security apparatus, enhancing flexibility and extending the reach of state-aligned coercive practices. These configurations ultimately underscore that hybrid security regimes are not symptoms of institutional weakness but deliberate political strategies that blend opacity, ideological framing, and institutional layering to reinforce authoritarian control and extend state power across domestic and regional arenas.

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