

## CHAPTER 2

# REINFORCING EUROPEAN DEFENCE INDUSTRY FOR TIMES OF GREAT POWER CONFLICTS



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### Abstract

With the European security environment deteriorating and destabilising in the 2010s, European defence – particularly the European defence industry – has gained heightened attention since 2022, as evidenced by Russia’s renewed aggression towards Ukraine. European countries have since attempted to efficiently address the dilemma of short-term production and stock replenishment versus long-term research, development, and innovation to offset the unpreparedness of European armed forces to fight protracted high-intensity wars. Accordingly, this chapter aims to outline the demand–supply equation of the European defence industry leading up to the Hungarian EU Presidency in 2024, and the adoption of the first-ever European Defence Industrial Strategy. This strategy aims to identify the drivers for developing the European Defence Industrial and Technological Base (EDTIB) as a defence ecosystem by the 2030s, enabling the sustainable provision of arms that European countries may need to defend themselves on European soil and uphold their interests.

The following analysis provides an overview of the trends leading up to 2024 for enhancing European defence industrial production, research and development. The chapter is structured as follows: first, it outlines the dynamics of the changing European security environment and threat perception, followed by an assessment of European capability gaps and policy responses aimed at closing these gaps, including an improved record of defence investments.

The main argument is that despite the constraints of EDTIB in the early 2020s, such as the effects of three decades of underinvestment, fragmentation of production capacities, shortcomings in providing raw materials and access to cutting-edge technology,

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as well as shortages of manufacturing capabilities and skilled manpower, there are nevertheless opportunities to remedy this situation. Drivers for comprehensive and efficient European defence industrial cooperation are being developed, including better-aligned strategic planning and defence capability development, currently underpinned by increasing defence spending, extensive joint defence procurements, and research and development (through the European Defence Industry Reinforcement through Common Procurement Act and the European Defence Industry Programme, supported by Permanent Structured Cooperation, the European Defence Fund, and the European Peace Facility).

**Keywords:** defence industry, strategy, armament, procurement, European Defence Technological and Industrial Base

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## **1. An ambivalent strategic landscape determining armed forces development and defence industry trends in Europe**

Strategic trends determining the current security environment and wider framework of European defence efforts can be traced back to the post-Cold War transformation of European defence architecture. This not only relates to institutions (North Atlantic Treaty Organization (NATO) and EU enlargement, institutionalised EU defence policy ambitions), but also armed forces' development (and downsizing), resource (re-)allocation and defence industry transformation. The approximately 25 years between the end of the Cold War and Russia's illegal annexation of Crimea in 2014 triggered a fundamental weakening in most aspects, followed by a slow reversal of the negative trends in post-Crimea shock. Defence efforts further accelerated since the 2022 escalation of the Russo-Ukrainian War, bringing back old, unresolved puzzles and raising new questions for European defence. In this 35-year period, the strategic milestones were 2008–2009, 2014–2015 and 2022, as briefly assessed below, which fundamentally determined the troubled state of the European Defence Industrial and Technological Base (EDTIB) as we know it in 2024.

### ***1.1. The “peace dividend” of the 1990s***

After the Cold War ended, amid the diminishing risk of a major military confrontation with Russia, countries in Western Europe downsized their armed forces, as exemplified by the International Institute for Strategic Studies (IISS). In 1990, West Germany fielded 215 combat battalions, Italy 135, France 106 and the United Kingdom 94, supported by the U.S. European Command's (EUCOM) 99 battalions. Meanwhile by 2015, Germany could field only 34, Italy 44, France 43 and the United

Kingdom 50, together with U.S. EUCOM's 14 battalions.<sup>1</sup> According to the Stockholm International Peace Research Institute (SIPRI), between 1989 and 1998 (the lowest point), NATO Member States' cumulative defence budgets decreased by 26% in real terms, after which it only reached 1989 levels by 2004.<sup>2</sup> Downsizing trends did not differ in Central Europe, driven by political transformation and economic scarcity.

This “peace dividend”, namely the unused resources from defence converted for civilian purposes, was welcomed by European countries, but it also inevitably led to chronic underfinancing in the armed forces, and the downsizing of Europe's defence industrial capacities. During the Cold War, European governments were willing to sustain larger armed forces and finance a degree of defence industrial overcapacity to ensure reliable access to equipment at scale; when the Cold War ended, the emphasis changed from readiness to efficiency.<sup>3</sup> Consequently, Europe's defence industrial capacities have been likened to artisan facilities, crafting a few sophisticated products,<sup>4</sup> losing readiness for high-intensity, large-scale production. During these years, arms exports largely contributed to the survival of national arms industries that were gradually losing government funding, domestic orders and manpower; thus unwillingly restructuring to fit into the new defence environment.

### ***1.2. Effects of the 2008 global economic crisis: the dual spiral of diminishing capabilities***

Following mild “normalisation” after the turn of the millennium, the 2008–2009 economic crisis brought about a strategic turning point. First, normalisation was driven by the changing military operational profile of European armed forces engaging in international interventions in Afghanistan, Iraq and Libya, along with the United States, followed by long-term multinational stabilisation operations. Despite providing a spending boost (2004–2010: +22%<sup>5</sup>) for militaries and some procurement of equipment necessary for overseas missions, these developments did not alter the overarching trend of shrinking force structures and diminishing stockpiles, while ageing military equipment was gradually replaced in most armed forces, often through off-the-shelf procurement. Off-the-shelf procurement often occurred outside Europe, particularly in the United States, undermining the consolidation of the European defence industry.

The 2008 global economic crisis had a severe impact on European countries; overall defence spending decreased by 10.1% in NATO and by 9.5% in NATO Europe between 2008 and 2014.<sup>6</sup> Summing up the strategic developments from 2008–2014 – also the period between the Russia–Georgia war and Russia's hybrid war on Ukraine

1 Barrie et al., 2020, p. 2.

2 SIPRI, 2023. Defence data are registered in constant USD 2022.

3 Aries, Giegerich and Lawrenson, 2023, p. 8.

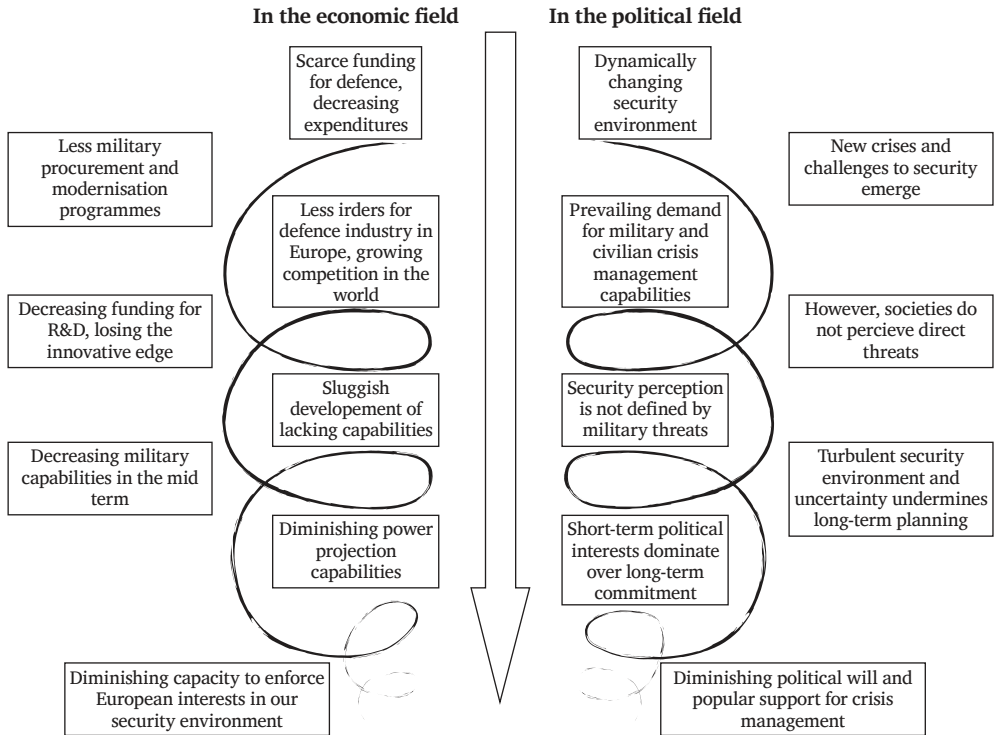
4 Karsenti, 2023.

5 SIPRI, 2023. Defence data are registered in constant USD 2022.

6 SIPRI, 2023. Defence data are registered in constant USD 2022.

– one can observe two parallel processes in political and economic domains, bringing about the degradation of military capabilities and the weakening of military tools of European power. As Csiki argued in 2014, these processes can be modelled as a ‘dual spiral of diminishing capabilities’ (Figure 1).<sup>7</sup>

Figure 1: Dual spiral of diminishing capabilities<sup>8</sup>



In the economic domain, the process of capability loss was triggered by scarce resources as an outcome of the financial crisis, which evolved from a primary (debt) crisis into a secondary (fiscal–monetary) crisis, inducing significant societal and political consequences in several European countries, especially in Southern and Central Europe. Diminishing resources dedicated to the defence sector resulted in investment cuts in armament modernisation, research and development (R&D) as well as procurements for national armed forces in the short term. The reduced domestic orders and contract cuts for weapons systems and defence equipment increasingly forced European manufacturers to turn to

7 Csiki, 2014, pp. 49–50.

8 Csiki, 2014, p. 49.

the global market, where they faced increased competition from arms manufacturers from the United States and emerging powers, while their resources for cutting-edge R&D decreased. Consequently, missing military crisis management capabilities, such as strategic enablers, either had not (fully) been developed or suffered delays and shortcomings owing to lack of technological background and/or financing. This was especially apparent in multinational capability development programmes, where diverging national priorities in financial crisis management could seriously undermine joint programmes. The resulting medium-term loss of military capabilities also limited crisis management options, thereby reducing Europe's power projection ability and assertion of foreign policy interests in European neighbourhoods.<sup>9</sup>

In the political domain, the loss of capabilities stemmed from the interactions between external and internal factors. Externally, the rapid and dynamic deterioration of the security environment (emerging crises and new types of threats, such as regional instability triggered by the Arab Spring, civil war and strengthening terrorism) resulted in a sustained demand for military and civilian crisis management. However, European societies did not perceive direct, imminent military threats before 2014, because of economic hardships (rising living costs, high unemployment rates and decreasing social benefits). This lack of perceived threats at a time of resource scarcity obviously meant that it was difficult to advocate funding for defence at a sustainable level (not to mention increasing it) when the economic crisis turned people's attention towards non-military dimensions of security. In this environment, short-term interests, such as the effective management of the economic crisis and scarcity of resources, dominated long-term strategic planning necessary for meaningful capability development and long-term commitment required for yielding crisis management efforts. Overall, it highlighted the diminishing political will and popular support for sacrificing funds for the development of defence capabilities and refraining from a more active foreign policy and involvement in crisis management efforts in the European neighbourhood.

This situation was exemplified by Libya's intervention, initially initiated by European powers, and led mainly by France and the United Kingdom. The conduct of operations was sobering as European powers had to rely on the support of the United States within the NATO framework (dubbed as "leading from behind") regarding key operational enablers: intelligence, surveillance and reconnaissance (ISR), command and control (C2), aerial refuelling, electronic warfare as well as munitions. Although the United States was meant to merely provide unique capabilities, their forces flew over 50% of sorties and provided 80% of ISR and refuelling, 25% of airborne C2 and suppression of almost all enemy air defences (SEAD) capabilities.<sup>10</sup> With shortcomings remaining unresolved, a similar dynamic was

<sup>9</sup> Mölling and Brune, 2011.

<sup>10</sup> Wall and Christianson, 2023.

observed a decade later when allied countries hurriedly evacuated tens of thousands of people from Afghanistan in 2021. European countries lacked the necessary resources for air transport, air refuelling, ISR and even ground forces to effectively secure Kabul Airport.<sup>11</sup>

The key drivers of capability loss were as follows. While the incentives for strengthening European defence were clearly present, short-term economic necessities and interests, coupled with non-military threat perception, overruled the steps of medium- and long-term planning and capability development. Therefore, the two parallel downward spirals triggered the loss of military capabilities, further limiting political and popular support to actively shape the European security environment.

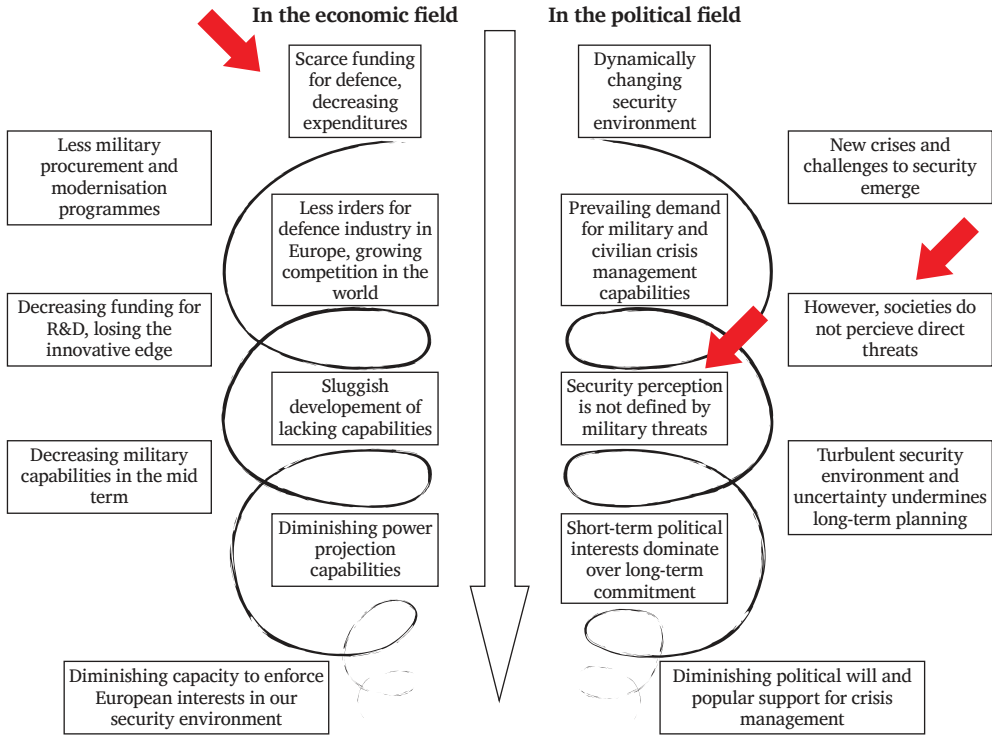
### ***1.3. Breaking the dual spiral of diminishing capabilities after 2014***

In the political field, the dual spiral of diminishing capabilities could be broken through changing European threat perceptions by identifying direct, imminent or close threats in the military domain. The increasingly new military challenges and threats that appeared in the deteriorating security environment – Russia’s aggression against Ukraine, emergence of the “Islamic State” further destabilising Iraq and Syria, the influx of refugees into Europe, and subsequent acts of Islamist terrorism in Europe – increased the sense of threat in European societies. In most countries in Central and Eastern Europe, this also ignited a clearly visible sense of military threat.<sup>12</sup> This was reinforced by the intensification of political, media and societal discourses on defence matters. Meanwhile, in the economic field, recovery from recession first created the possibility of stopping the reduction of resources devoted to defence, and then gradually increasing military expenses. Figure 2 highlights this, as indicated by the arrows pointing to the steps in which the spirals had been broken.

<sup>11</sup> Bergmann and Svendsen, 2023, p. 23.

<sup>12</sup> Čížik, 2020; Kříž, 2020; Palczewska, 2020; Sarcinschi, 2020.

Figure 2: Breaking the dual spiral of diminishing capabilities<sup>13</sup>



The two institutions that played decisive roles in European security, the EU and NATO, also reacted to these changes. In December 2013, the European Council, arguing that defence matters in Europe,<sup>14</sup> restored defence policy issues on its agenda after a 5-year hiatus,<sup>15</sup> culminating in the adoption of the EU Global Strategy in 2016 and a package of proposals aimed at revitalising Common Security and Defence Policy (CSDP).<sup>16</sup> In parallel, NATO Member States decided to strengthen the alliance’s deterrent, reactive and collective defence capabilities by adopting the

13 The figure was edited by the author.

14 Council of the European Union, 2013, p. 1.

15 Csiki, 2014, p. 1.

16 The EU began to establish frameworks and mechanisms for joint capability development and for filling capability gaps. The joint decision to establish Permanent Structured Cooperation (PESCO), with a special focus on the Crisis Response Operation Core (EUFOR CROC), the first project to initiate the coordination of Member States’ defence planning processes based on the results of the Coordinated Annual Defence Review (CARD) and Capability Development Plan (CDP), supported by the Military Planning and Conduct Capability (MPCC), and resources dedicated to defence R&D by the European Commission (European Defence Fund, EDF) have all pointed to this direction.

Readiness Action Plan (RAP) at their 2014 Newport summit as well as increasing the defence spending of Member States to 2% of gross domestic product (GDP) (“defence pledge”),<sup>17</sup> followed by an “implementation” summit for executing RAP in Warsaw (2016). Consequently, NATO Europe’s cumulative defence spending increased by 29.3% in real terms between 2014 and 2022.<sup>18</sup> In 2014, only three NATO allies fulfilled the 2% commitment (the United States, United Kingdom and Greece), and in 2022, ten countries achieved this benchmark, with the median average increasing to 1.65% of GDP for the 30-member alliance.<sup>19</sup> These political and economic developments demonstrate that the dual spiral of diminishing capabilities ended after 2014–2015. However, subsequent years did not fundamentally change the dynamics of European defence.

#### ***1.4. Effects of Russia’s escalating aggression towards Ukraine (2022–present) on European defence efforts***

The most recent strategic turning point in European defence was Russia’s renewed and escalated aggression towards Ukraine in 2022, triggering a mostly unified and coordinated political, economic, humanitarian and military response from EU and NATO countries. Despite the United States whistleblowing since late autumn 2021, the large-scale Russian aggression, which started from 24 February 2022, was met with surprise and perceived as a strategic shock by most European countries, including the Great Powers, Germany and France.

In response, measures to strengthen European defence and deterrence both within EU and NATO frameworks were undertaken, in addition to a major effort to support Ukraine’s self-defence. Strengthening European defence cooperation was built on five pillars: increasing defence investment, purchasing equipment to remedy capability shortcomings, resupplying equipment and armament stocks, increasing multinational cooperation and supporting the European defence industry, where possible. The toolbox for achieving these goals had also been widened: beyond the existing Permanent Structured Cooperation (PESCO) and European Defence Fund (EDF) frameworks, new initiatives – European Defence Industry Reinforcement through Common Procurement Act (EDIRPA) for short-to-mid-term and European Defence Industry Programme (EDIP) for mid-to-long-term defence investment and procurement – were created (more details later in this chapter), and new ways of joint financing, for example through European Peace Facility (EPF), were considered.<sup>20</sup>

Complementing the EU response, NATO also took decisive steps framed within the Madrid Summit declaration, also identifying the Russian Federation as ‘the most

17 Csiki, Tálás and Varga, 2014, pp. 112–128.

18 SIPRI, 2023. Defence data are registered in constant USD 2022.

19 NATO, 2022, pp. 2–3.

20 PESCO: Permanent Structured Cooperation; EDF: European Defence Fund; EDIRPA: European Defence Industry Reinforcement through Common Procurement Act, EDIP: European Defence Investment Programme.



significant and direct threat to allies' security and to peace and stability in the Euro-Atlantic area'.<sup>21</sup> These steps included strengthened forward defence across eastern flank Member States through more forward-deployed combat formations, higher levels of readiness, prepositioning equipment, reinforced allied deterrence posture and readiness through enhanced NATO Response Force, dubbed the new NATO Force Model.

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## 2. European military balance of the early 2020s – military and defence industrial capabilities

The 2022 escalation of the Russo-Ukrainian War ended “Europe’s geopolitical holiday”;<sup>22</sup> the 25 years of peace in Europe, which in historical perspective was rather an anomaly – an exception – not the norm. This break from the comfortable practice of outsourcing European defence – particularly deterrence – to the United States should cease in the 2020s. However, at present, European military and defence industrial capabilities are weak and fragmented, owing to decades of underinvestment. Faced with degrading capabilities driven by the effects of the 2008–2009 economic crisis summarised above, experts have warned that European countries may shift to maintaining “bonsai armies”<sup>23</sup> as in the 2010s. A decade later, the assessment continues to be dire, indicating that as an outcome of these trends, ‘the armed forces in European NATO and European Union member states are hollowed out, plagued by unserviceable equipment and severely depleted ammunition stocks.’<sup>24</sup>

### 2.1. *Capability gaps in the early 2020s*

We can obtain a glimpse of changing European military capabilities – the quantity of assets in European countries’ armed forces – by exploring the IISS Military Balance+ database, which offers a quantitative overview and qualitative assessment in this regard. These data show a sizeable decrease in European military assets available across many major arms categories between 2014 and 2023, along with a higher degree of heterogeneity in the platforms operated (Table 1). In comparison, the U.S. Armed Forces operates a single type of main battle tank (versus 11 in Europe), six types of armoured fighting vehicles (versus 49 in Europe) and six types of fighters (versus 19 in Europe).<sup>25</sup>

21 NATO, 2023.

22 Commijs, 2019.

23 Anderson et al., 2016, pp. 13–16.

24 Aries, Giegerich and Lawrenson, 2023, p. 7.

25 Bergmann and Besch, 2023.

*Table 1: The changing equipment inventories of EU Member States in major arms, 2014–2023<sup>26</sup>*

Major arms type	“Active” inventories of EU-27 in 2014 (No. of assets/ systems)	“Active” inventories of EU-27 in 2023 (No. of assets/ systems)	Change (%)	Number of design families operated
Main battle tank	4,657	3,885	–17%	11
Armoured fighting vehicle (APCs, IFVs)	21,259	20,344	–4%	49
Artillery (towed, self-propelled, MLRS)	4,723	4,789	+1%	35
Fighter (fighter, fighter-ground-attack)	1,721	1,513	–12%	19
Transport plane (light, medium, heavy)	561	543	–3%	25
Tanker aircraft	54	25	–54%	5
Attack helicopter	257	278	+8%	5
Air defence system (SAM launcher)	1,085	1,043	–4%	26

Aligning with the legacy of operational capability gaps in the 2010s mentioned earlier, the list of strategic enablers was either still missing or available only to the largest allies or the United States by the 2020s. Therefore, it would be extremely difficult to replace or substitute for European countries in the short-to-mid-term. Critical dependencies included strategic reconnaissance, surveillance, intelligence and target acquisition capabilities; command, control and communications systems, including space assets; deployable operational commands above the division level; deployable air force commands; theatre air defence; and missile defence, including early warning systems, long-range bomber forces and significant numbers of fifth-generation fighter aircraft. European States also have limited capabilities in long-range precision strikes, including surface-to-surface cruise missiles, aerial refuelling, strategic and tactical airlifts, and special operations aircraft. A conflict with

<sup>26</sup> IISS, 2023. All data on European armed forces are derived from the Military Balance+ database, compiled and assessed by the author. The set includes all current EU Member States for both 2014 and 2023 (excluding the United Kingdom and European NATO members). The table was compiled by the author.

a major regional power would have seriously tested the capabilities of European naval forces, and the ability to disembark from the entry force (an EU battlegroup, for example) in a crisis management operation would also be questioned. Based on simulations and modelling, it was estimated that EU Member States would have the necessary capabilities to conduct short-term rescue and evacuation operations and humanitarian operations on their own, provided they mobilise the assets at their disposal. However, after Brexit, the naval capabilities of EU-27 fell short in humanitarian operations; and if these were parallel or long-term requirements, they would already exceed European operational capabilities.<sup>27</sup>

European enabling capabilities have been severely limited, particularly in the air domain. According to Bergmann and Svendsen, European countries operate approximately 35 relevant airborne C2 platforms (compared to 120 U.S. aircraft), approximately 150 air-to-air refuelling aircraft (compared to almost 450), a few dozen relevant aerial ISR aircraft (compared to 150) and about 200 unmanned aircraft (compared to over 900). Europe is completely reliant on the United States regarding electronic warfare and SEAD capabilities. Regarding short-to-medium-range air defence, European countries' stocks have been severely depleted by military aid provided to Ukraine, particularly regarding Soviet legacy systems operated by eastern flank NATO members. For long-range air and missile defence, European countries have very limited capabilities, relying on a few surface-to-air systems (Patriot, SAMP/T), and lack meaningful capabilities in the service of advanced threats and long-range weapons, such as high-velocity missiles and hypersonic glide vehicles. Regarding the navy, European countries retired one-third of their main surface combatant ships.<sup>28</sup>

The European Defence Agency's (EDA) Coordinated Annual Review on Defence (CARD) report, first published in November 2020, identified 55 specific capability development areas where EU Member States could/should make meaningful progress. These included 17 land, 14 air, 12 naval, 5 joint force and strategic, 4 space and 3 cyber theatre capabilities. In addition, 56 defence R&D opportunities were identified, as well as operational cooperation opportunities in the areas of force projection, non-kinetic engagement, force protection and capability development. The 55 areas were grouped into 6 clusters to provide guidance for the coordination of national capability development and defence R&D plans. For example, in the PESCO framework and with the support of EDF. The six key cluster areas identified were general-purpose tank type, individual military equipment, surface patrol vessel type, anti-drone weapon systems and anti-access, area denial devices, space capabilities and military mobility. These areas need to be supported by defence industry R&D in artificial intelligence (AI), cyber defence, new sensor technologies, materials, energy-efficient propulsion systems, unmanned devices and robotics.<sup>29</sup> In its assessment

27 Sabatino et al., 2020.

28 Bergmann and Svendsen, 2023, pp. 23–24.

29 European Defence Agency, 2020.

of the 2022 CARD review, the EDA identified essentially the same areas for development in terms of defence resource gaps and capability requirements based on the first lessons learnt from the Russo-Ukrainian War, underlining the need for the European defence industry to play a leading role in both manufacturing and R&D.<sup>30</sup>

Even in early 2024, the EU's strategic capability to act was limited to low-intensity operations in terms of available military capabilities. To provide higher-intensity operational capabilities, we have two options: either continue to rely on NATO, including the U.S. military capabilities to a decisive extent, or dynamically develop EU capabilities in the areas outlined above, and devise European national capabilities, with Member States making more of them available to the EU.

## *2.2. European policy responses to address shortcomings in defence*

Policy action building on the adoption of the EU Global Strategy (2016) was supported by various initiatives, such as the Implementation Plan on Security and Defence, European Defence Action Plan: Towards a European Defence Fund, initiation of PESCO and EDF, and creation of the Directorate-General post for Defence Industry and Space (DG DEFIS). However, as Csernatoni pointed out, EU Member States did not share a common assessment of geopolitical threats and challenges;<sup>31</sup> thus a two-year joint assessment process was carried out to formulate 'an ambitious and actionable Strategic Compass, making the best use of the entire EU toolbox'.<sup>32</sup> In 2022, the Strategic Compass provided the operationalisation of the Global Strategy – thus actually serving as a security and defence strategy – used (among others) to define the capability requirements of the EU's military operational vision for the new Headline Goal, covering the next 10-year period.<sup>33</sup>

In this process, EDTIB was financed through the EU's Framework Programmes for Research and Innovation (2014–2020) and Horizon Europe (2021–2027), realised within the Pilot Projects (2015–2018), Preparatory Action on Defence Research (2017–2019), European Defence Industrial Development Programme (2019–2020) and EDF (2021–2027) frameworks. Practically, the expansion of the EU toolbox has gradually augmented resources available in this area (see details below). Not only the EDF (around 7 billion euros) has been mobilised, but additional research and industrial policy resources as well: the Digital Europe Programme (around 6.7 billion euros), the Horizon Europe (around 76 billion euros),<sup>34</sup> Space programme (around 13 billion euros) and Military Mobility Action Plan (1.69 billion euros).<sup>35</sup> Therefore, it can be assumed that this increase in resources will, in the long term, serve as an

30 European Defence Agency, 2022.

31 Csernatoni, 2021, p. 16.

32 Council of the European Union, 2021.

33 European External Action Service, 2022.

34 Zubascu, 2024.

35 Nádudvari, 2020, p. 8.

incentive for Member States to increase their participation in European capability development projects.<sup>36</sup>

As Fiott summarised, the EU's reactions to the strategic shock of Russia's renewed aggression towards Ukraine can be broadly classified into three main types: i) strategic reorientation (visible in the finalised provisions of the Strategic Compass), ii) defensive weaponisation (visible in the arms deliveries of the EU to Ukraine utilising EPF) and iii) industrial rehabilitation (an attempt to overhaul European defence industrial performance).<sup>37</sup>

Aligning with NATO's new Strategic Concept (Madrid, 2022), the Strategic Compass identified Russia as a challenger to the European status quo and security architecture and called for specific action through 80 policy recommendations to boost the robustness and speed of EU military action, build up resilience to internal and external shocks, develop military capabilities and strengthen partnerships.<sup>38</sup>

In terms of defensive weaponisation, the EPF, the off-budget tool of CSDP, was given the new role of providing lethal and non-lethal military support to Ukraine. Through three rounds of increases in 2022–2023, the EPF has a budget of over 12 billion euros, of which 5.6 billion euros have been mobilised to support Ukraine.<sup>39</sup> Moreover, 1.5 billion euros diverted for defence research from Horizon Europe on 1 February 2024 (mentioned above) have also been added to EDF through the Strategic Technologies for Europe Platform (STEP).<sup>40</sup>

As a direct reaction to the Russo-Ukrainian War, EU heads of state and government endorsed the European Commission's (EC) defence package of 15 February,<sup>41</sup> and on 11 March 2022, committed to 'bolstering European defence capabilities'.<sup>42</sup> The EC and EDA prepared the defence investment gap analysis in May 2022, underlining that EU Member States need to extend collaborative projects in production and procurement to create economies of scale, also identifying urgent investment gaps in producing ammunitions, and air and missile defence systems, as well as calling for phasing out legacy Soviet equipment and replacing them with European-made assets (such as main battle tanks, armoured fighting vehicles and artillery in the land domain).<sup>43</sup> The Act in Support of Ammunition Production (ASAP) served specifically to bolster 155 mm-calibre artillery rounds production. Next, EDIRPA was adopted in July 2022 with a budget of 500 million euros (later reduced to 300 million euros) as a short-term measure to boost the competitiveness and

36 European Defence Agency, 2022, p. 2.

37 Fiott, 2023, p. 449.

38 Council of the European Union, 2022a, pp. 2–5.

39 Council of the European Union, 2024.

40 Amid pressing priorities, Horizon Europe will have its 95.5-billion-euro budget cut by 1.2 billion in 2024, with 1.5 billion euros diverted to defence research, following the EU heads of state meeting of February 1, 2024. This signals both scarcity of resources and strong dedication to support defence R&D.

41 European Commission, 2022a.

42 Council of the European Union, 2022b, pp. 3–5.

43 European Commission, 2022b, p. 7.

efficiency of EDTIB in 2022–2024. EDIRPA will be followed by the creation of EDIP to further strengthen the EU’s defence industry and production capabilities in the long-term, thus addressing the identified capability gaps.<sup>44</sup> The European Investment Bank was also assigned the role of financing dual-use research, development and innovation, civilian security infrastructure and cutting-edge technology projects.<sup>45</sup> By further strengthening institutional partnerships with the DG DEFIS, the EU Agency for the Space Programme, EDA and NATO, the new European Investment Bank (EIB) Strategic European Security Initiative will make financing up to eight billion euros available by 2027.<sup>46</sup>

These steps outline a series of coherent actions aimed at creating policy and regulatory frameworks, as well as financial incentives for enhancing European defence industrial collaboration and increasing production capacities and capabilities in this field (Figure 3). EDF, reinforced by STEP, incentivises defence R&D, moving forward viable and marketable projects to production – exemplified by the tailored-to-needs support of ASAP in ammunition production – opening the possibility of joint acquisitions. The realisation of joint acquisitions can be underpinned by EDIRPA in the short term, occasionally supported by EPF, as again exemplified by the joint procurement of ammunition to replenish European stocks. Future production and acquisitions should be framed by EDIP, which also relies on the extra funding incentives of EIB. This process, encompassing defence R&D, production and joint acquisition, will soon be regulated by the upcoming European Defence Industrial Strategy (EDIS).<sup>47</sup> EDIS will rest on the strategic vision of the EU enshrined in the Global Strategy, translated into defence strategy and capability requirements through the Strategic Compass, potentially moving joint action towards common military planning at the EU level. As the case of direct military aid provided for Ukraine has shown, the possible transfer to third countries is also a viable option that policymakers should assess and regulate arms sales and the transfer of defence technology in general. Currently, this relates to the application of EPF for providing lethal and non-lethal military support, security assistance, etc. to third countries; however, for future applications, these considerations should be included in the EU-level unified arms export control policy (if adopted).

Figure 3 also illustrates that defence industrial activities are regulated and realised through three simultaneous strands of action: Member States and their (national or multinational) defence companies realise R&D, production and sale of procurement parties to acquisitions in the defence market; framework programmes and financial incentives (EDF, ASAP, EDIRPA, EDIP) are regulated and operated via the community system, with the EC playing a central role; while EPF and the

44 Andersson and Cramer, 2023, p. 42.

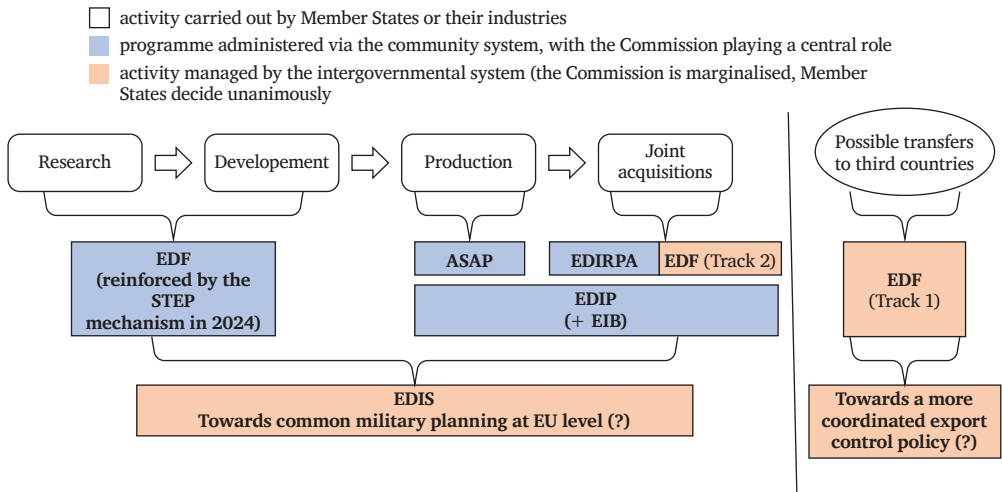
45 European Investment Bank, 2022.

46 European Investment Bank, 2023.

47 For a preliminary assessment of the key topics of EDIS and the hurdles related to its adoption, anticipated for early 2024, see: Fiott, 2024.

negotiated adoption of further strategic framework documents (such as EDIS or an EU arms export control policy) should be managed through intergovernmental co-operation and decisions, where the EC is marginalised and Member States decide unanimously.

Figure 3: Current frameworks and regulations for supporting EDTIB through collaborative action and underlying programmes.<sup>48</sup>



It is worth emphasising that the incentives agreed upon since February 2022 are formulated based on a different planning assumption during the 2000s and the 2010s, the starting points for preparing for crisis management in the European neighbourhood, as well as providing the necessary capabilities for such operations. Starting from 2022, preparing for deterrence and defence against a near-peer or peer-to-peer adversary, namely Russia, became the new focus of capability planning, bringing many apparently existing capability gaps and newly emerging needs to the fore, accompanied by the need to replenish European armament stocks for the military aid provided to Ukraine. These are the short-, mid-, and long-term needs that the European defence industry will need to address, offering multiple opportunities for developing and even restructuring EDTIB.

48 The original version of this figure had been introduced at the 'National Visions of the EU Defence Industrial "Toolbox": the Italian and Swedish Cases' webinar organised on 12 January 2024, by Institut de Relations Internationales et Stratégiques, with the participation of Alessandro Marrone (Istituto Affari Internazionali), Lorenzo Scarazzato (Stockholm International Peace Research Institute) and Isabelle Desjeux (Safran Electronics). Minor changes applied by the author.

### 2.3. Military support to Ukraine

The EU and its Member States together provided over 96 billion dollars in financial, military, humanitarian and refugee assistance during the first year of the war. This included over 30 billion dollars in military assistance for ammunition, air defence systems, fighting vehicles, main battle tanks and drones, as well as military training to 40,000 Ukrainian soldiers by the end of 2023. Breaking a strategic taboo, funds from EPF – worth six billion dollars – were used for procuring arms and ammunition for the first time ever to be handed over to Ukraine. In parallel, 2.2 billion dollars were earmarked to reinforce European defence industry capacities and an additional 535 million dollars for ammunition production capacity, both for producing ammunition for Ukraine and replenishing European stocks.<sup>49</sup>

In addition, EU Member States provided significant direct military aid to Ukraine (see Table 2). Although the data are not fully transparent, open-source data from Oryx provide an estimate of the quantity of equipment handed over to Ukraine in 2022–2023. With more than 10,000 pieces of major arms assets provided to Ukraine internationally over two years, EU Member States are registered to have delivered and pledged more than 4,000 of these, providing most aircraft (100%), tanks (96%) and helicopters (72%), as well as a significant proportion of air defence systems (55%), artillery (53%) and armoured fighting vehicles (33%) by January 2024.

*Table 2: Major arms provided for Ukraine by EU Member States as military assistance in 2022–2023.<sup>50</sup>*

Major arms	EU Member States			Total international	Verifiable EU ratio
	Delivered	Pledged	Total		
Aircraft	45	58	103	103	100%
Helicopters*	44	17	61	85	72%
Tanks	576	249	825	860	96%

<sup>49</sup> European External Action Service, 2024.

<sup>50</sup> AFV: armoured fighting vehicle; IFV: infantry fighting vehicle; APC: armoured personnel carrier; MRAP: mine-resistant, ambush-protected vehicle; IMV: infantry mobility vehicle; MLRS: multiple rocket launch systems; SAM: surface-to-air missile.

\*: Attack, transport and utility helicopters in total.

\*\* : The total number is unknown as many pledges and deliveries were not publicly declared.

Source of data: Oryx, 2024. All data reflect the situation as of 1 February 2024. The table was compiled by the author.



Major arms	EU Member States			Total international	Verifiable EU ratio
	Delivered	Pledged	Total		
<b>Armoured fighting vehicles total</b>	<b>1,479</b>	<b>1,465</b>	<b>2,592</b>	<b>7,910</b>	<b>33%</b>
Including: AFV**	40	n. a.	n. a.	160	25%
IFV	374	340	714	900	79%
APC	752	550	1302	2200	59%
MRAP**	82	230	n. a.	1150	min. 27%
IMV	231	345	576	3500	16%
<b>Artillery total</b>	<b>533</b>	<b>81</b>	<b>593</b>	<b>1,126</b>	<b>53%</b>
Including: Towed artillery	114	31	176	461	38%
Self-propelled artillery	367	50	417	555	75%
MLRS**	52	n. a.	n. a.	110	min. 47%
<b>SAM systems**</b>	<b>52</b>	<b>14</b>	<b>66</b>	<b>121</b>	<b>55%</b>

This aspect is important for two reasons: on the one hand, major arms, weapons and equipment, as well as ammunition were provided from existing stocks, thus inevitably reducing the readiness and defence capabilities of European countries in the short term, even if we take into consideration that not necessarily most modern equipment had been handed over, but in many cases outdated post-Soviet legacy assets (as these were compatible with the Ukrainian armed forces). However, eventually discarding legacy equipment – particularly in Central and Southeastern Europe – forces these donor countries to acquire new, modern equipment, necessitating extra defence investments for procurement and creating a situation when they can decide whether to buy European or other products.<sup>51</sup> This is a high value gap on the demand side for EDTIB, to be addressed or wasted.

51 It is worth noting that military assistance to Ukraine since 2022 has not been the first incentive aimed at European countries to replace Soviet legacy military assets in their armed forces' inventories. The U.S. European Recapitalization Incentive Program, established in 2018, granted close to 300 million dollars in financial subsidy to countries buying American weapons worth 2.5 billion dollars. This is the same concept that EU and EU Member States would need to follow – bound to a commitment of buying European arms to support EDTIB. See: U.S. Department of State, 2021.

### 3. Snapshot of European defence investment trends

There are a couple of choices for obtaining data on European defence expenditure trends, such as the Military Expenditures Database of SIPRI or NATO's defence expenditure data; however, for consistency in methodology and comparability of data, we rely only on defence data released by EDA annually. In December 2023, the latest data, focused on defence investment in 2022 and long-term trends between 2005 and 2022.<sup>52</sup> This also provided an opportunity to track the negative effects of the 2008–2009 economic crisis and the turning trend after 2014–2015, as assessed previously in this chapter. However, most defence spending pledges that had been taken as reactions to Russia's repeated aggression were realised in 2023 and as such, could not be included in this overview.

Although there is no legally binding target for individual national defence spending levels for EU Member States, most of them had agreed in the framework of PESCO and/or NATO to increase their defence expenditures in principle (in NATO: towards the 2% of GDP benchmark). As mentioned earlier, strategic drivers are pressuring European countries to strengthen their defences for several reasons, and in many ways, their improved record of defence spending over the past two years is understandable.

As noted by EDA, in 2022, the total defence expenditure of EU-27<sup>53</sup> totalled 240 billion euros, continuing an increasing trend for eight years on a row – since 2015 – and realising a 6% increase in real terms compared to 2021. Compared with the low point of 2014, their total defence expenditure increased by 69 billion euros, or 40% in real terms, but still lagged by 76 billion euros, had they spent at the 2% GDP level (Figure 4). The data also indicate that EU defence spending returned to the pre-crisis (2008–2009) level only in 2019, which translates into a decade of lost investments.

Among defence expenditures, defence investment constitutes the procurement of defence equipment and R&D. In 2022, defence investment registered a 5.9% growth compared to 2021, reaching a total of 58 billion euros, surpassing the 20% agreed benchmark by 10 billion euros in 2022, a positive trend visible since 2018 (Figure 5). As the EDA noted, 20 of 27 Member States fulfilled the 20% benchmark, with 14 countries surpassing 25% and the highest share being 53.5%.

In 2022, Member States allocated 48.6 billion euros for the procurement of new equipment, taking 83.7% of the defence investment expenditure, up by 7% year-on-year, signalling more extensive – or more expensive – investments in defence equipment. Meanwhile, spending on R&D reduced by 1.9% compared to 2021. It is worth noting that 25 Member States spent more than 90% of their defence investment on procurement; the overall trend indicates that these are mostly off-the-shelf procurements from non-EU countries, which has been further reinforced by the current security context, as will be explained in detail later.

52 European Defence Agency, 2023. All data in this subchapter are derived from this source unless noted otherwise.

53 As Denmark ended the opt-out from CSDP, effective July 1, 2022, as a direct consequence of Russia's invasion of Ukraine, Danish defence expenditure data had also been included (unlike in previous years).

Figure 4: EU-27 total defence expenditure (constant 2022 prices) and 2% of GDP guideline<sup>54</sup>

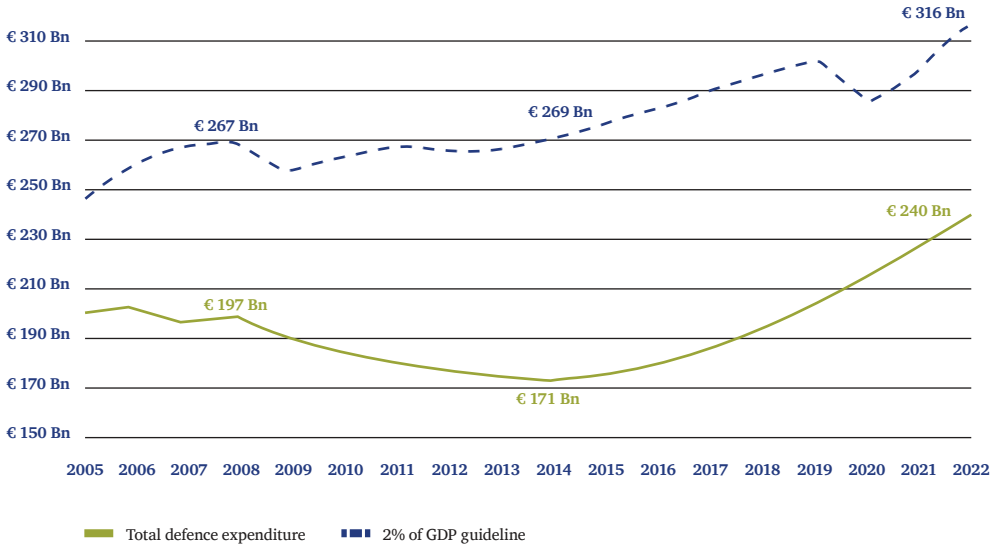
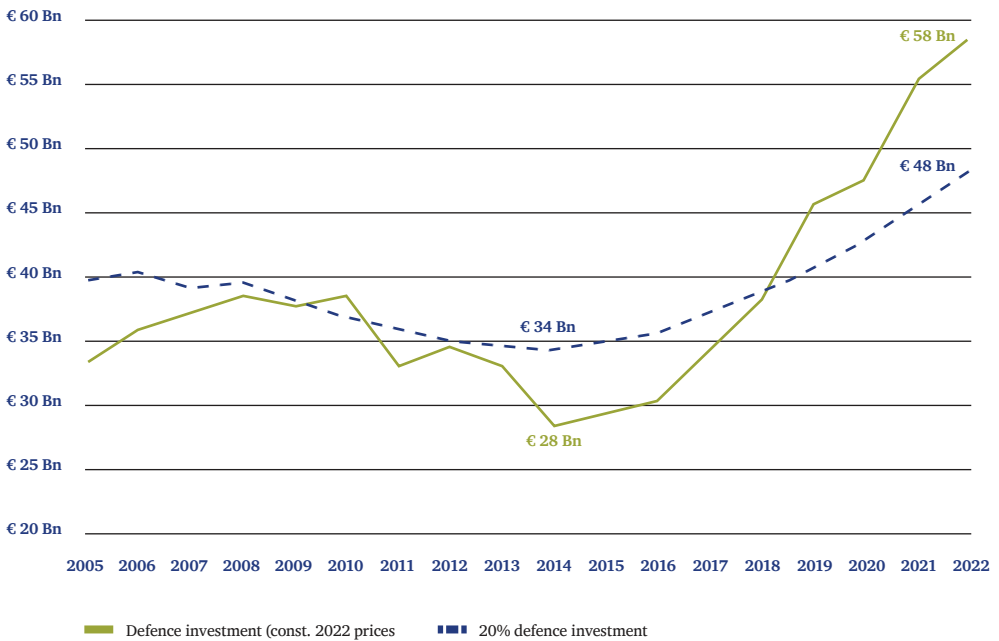


Figure 5: EU-27 total defence investment (constant 2022 prices) and expected 20% defence investment level<sup>55</sup>



54 European Defence Agency, 2023, p. 4.

55 European Defence Agency, 2023, p. 8.

Defence R&D was funded by the remaining 16.3%, or 9.5 billion euros of defence investment in 2022, of which research and technology (R&T) received 3.5 billion euros, a 5.7% year-on-year decrease in real terms, while only two countries fulfilled the 2% benchmark in this field in 2022 and three spent between 1–2% on defence research and technology. This is in stark contrast with the 41% increase from 2020 to 2021.

In sum, we have seen a positive trend regarding the overall financing of defence, driven by the threat perception of a deteriorating and destabilising security environment in the European neighbourhood, both in the east and south. Simultaneously, Member States have a relatively mixed record of long-standing benchmarks regarding how these funds should be used collaboratively, going beyond national R&D, production and procurement.<sup>56</sup> EU Member States allocated more than 20% of their defence investments for equipment procurement (including R&D and R&T), but defence R&T funds remained below the 2% benchmark for total defence spending in 2022. Regarding European collaborative equipment procurement, which should be at least 35% of total equipment spending, EDA could not provide an assessment because procurements were not transparent, with only a few countries providing the data.<sup>57</sup>

Considering that defence expenditures and procurements soared since Russia's 2022 invasion of Ukraine, it is imperative to look beyond EDA data for 2023, which is possible following the announcements of European countries. As Maulny summarised, of the 27 European countries that have released public data on defence (25 EU countries, the United Kingdom and Norway), 25 increased their defence expenditures from 2022 to 2023. In 18 of these 25 countries, the increase was higher than the rate of inflation, resulting in real term growth, while Latvia, the Netherlands, Poland, Slovakia and Slovenia announced increases twice the rate of inflation. Poland announced a 46% (!) nominal increase, while Austria, Baltic countries, Finland and Sweden reported a 20% increase.<sup>58</sup> Notably, the German government created a 100-billion-euro special fund for defence modernisation and financing short-term procurements, to be used until 2025. Based on national data, the equipment expenditure of European countries from 2022 to 2023 increased by 21.5 billion euros, with Germany representing approximately one-third of the total, and Poland providing

56 EU Member States approved four collective benchmarks for defence investment in November 2007 within the EDA Ministerial Steering Board meeting.

57 In 2017, only 7% of R&D (compared to the 20% target) and 17% of procurement (compared to the 35% target) were conducted in a multinational framework; 80% of procurement programmes were national, which is guaranteed by Article 346 of the Lisbon Treaty, allowing Member States to claim that national security can only be guaranteed if procurement is carried out nationally. This is so although it was originally intended to be the “exception” and not the “rule” – but multinational defence industrial cooperation requires (would require) a particularly strong political will. This national attitude is currently being challenged by the incentives to fund capability development, as well as R&D, in multinational frameworks only (PESCO, EDF). European Court of Auditors, 2019, pp. 47–48.

58 Maulny, 2023, p. 5.

more than 15%. By contrast, EU countries' defence investment grew by 8.4 billion euros in the previous year.<sup>59</sup>

Despite the outstanding short-term increase triggered by the strategic shock of the escalating Russo-Ukrainian War, it remains uncertain, how long this drive will last. EDA estimates EU defence spending to rise to 290 billion euros in 2025, but longer-term multi-year defence spending is an exception than a rule among European countries (France and the Netherlands as positive examples); thus, the stability and predictability of defence investments is not guaranteed. It depends on various factors, such as how the war in Ukraine will unfold in 2024–2025, whether there will be an escalation or territorial expansion of the conflict, how European countries assess their military defence capabilities, quantitative and qualitative capability gaps, and financial sustainability of their defence efforts. Lastly, the outcome of the upcoming U.S. elections and certainty of its defence guarantees – at least verbally dependent on Donald Trump's commitment if elected – could have a direct impact on European defence efforts.

Beyond the surge in defence investment, procurements have also been soaring since mid-2022; total equipment acquisitions contracted by European countries from mid-2022 to mid-2023 are estimated to be around 100 billion euros, representing a 21.5 billion-euro increase year-on-year. Maulny's assessment demonstrated that 70–75% of acquisitions had been contracted after Russia's invasion, and 5% were linked to stock replenishments. Acquisitions from outside the EU accounted for 78% of procurement contracts, with the United States alone accounting for 63%.<sup>60</sup> A few examples of high-value acquisitions include 35 F-35A aircrafts (7.9 billion euros) and 60 CH-47 helicopters (8 billion euros) for Germany, and 96 AH 64-E helicopters as well as tanks, armoured vehicles, combat aircraft, artillery, missiles and UAVs (worth 25 billion euros for Poland). While defence procurements have surged since 2022, European defence industrial production has fallen short on capacity and delivery times spanning years, thus pushing off-the-shelf procurements to the forefront of many European countries. As Liang et al. noted, arms companies' efforts to increase production capacity in 2022 were hindered by labour shortages, rising costs and supply chain disruptions.<sup>61</sup> These tensions must be addressed through the development of EDTIB, as discussed in the following sections.

59 Maulny, 2023, p. 6.

60 Maulny, 2023, p. 2.

61 Liang et al., 2023, p. 1.

## 4. Developing European Defence Industrial and Technological Base in the 2020s

As changing European threat perceptions have prioritised defence, and the strategic shock of Russian aggression pushes forward the realisation of the EU's strategic vision in terms of upgrading military capabilities by providing increased funding, the key questions for the next few years appear to be: what equipment and assets to buy, and from what source? Essentially, how does the demand and supply meet? There is also a tension between short-term priorities, such as replenishing stocks, and long-term goals, such as developing an EDTIB.

### *4.1. The basic tenets of arms procurements and arms industry development*

There are fundamental requirements for adequately equipping defence forces. As Uttley summarised:

Three perennial procurement challenges emerge from the primary objective of ensuring armed forces are equipped to achieve national security and foreign policy objectives. The first is “what equipment to buy” to minimize the risk of their national armed forces becoming inferior relative to actual or potential rivals. The second challenge for states is “where to buy equipment from”; states need to create and secure dependable supply chains that enable them to maintain “operational sovereignty” over the use of their military equipment. The third challenge for governments is “how to buy military capability” to ensure the timely procurement of new equipment that meets the performance requirements of the armed forces at fair and reasonable prices.<sup>62</sup>

Accordingly, there are four procurement goals for any State:<sup>63</sup> (a) ensure that the national armed services are equipped with state-of-the-art military systems; (b) obtain an appropriate degree of national autonomy – or “security of supply” – over the use, upgradation and replacement of the weapons systems acquired by their armed forces;<sup>64</sup> (c) realise “indirect” national economic, technological, industrial and

<sup>62</sup> Uttley, 2018, p. 73.

<sup>63</sup> Uttley, 2018, p. 75.

<sup>64</sup> As Uttley points out, ‘All states, in the abstract, strive for national self-sufficiency through the creation or retention of indigenous defense-industrial capacity capable of domestic weapons research, development and production. In practice, evidence suggests that states with existing indigenous defense industries have sought to restrict their purchasing of strategically important military equipment and sub-systems to domestic suppliers on “security of supply” grounds. Correspondingly, states with limited or non-existent defense industrial capabilities have sought to minimize their dependence on non-national suppliers when importing weapons by insisting on local production and development rights (“offsets”) in arms transfer agreements.’ Uttley, 2018, p. 75.

employment benefits arising from their defence procurement expenditure; (d) secure “value-for-money” when choosing between alternative weapons systems available from domestic and non-domestic suppliers.

In European countries, these goals translate into providing fifth generation fighter/multirole aircraft, air-to-air refuelling, strategic airlifts, drone forces, satellite communications that underpin intelligence, surveillance, target acquisition and reconnaissance capabilities, air and missile defence, modern surface naval combatants and submarine forces, as well as the next generation of land forces, such as the main battle tank, armoured fighting vehicles and long-range precision artillery. To provide several of these assets, probative European collaborative programmes have R&D as well as production. These include the Future Combat Air System and Tempest programmes, NH-90 multirole helicopter, A400M medium transport aircraft, European Medium Altitude Long Endurance Remotely Piloted Aircraft System (Eurodrone), Galileo and GOVSATCOM satellite positioning and communication systems, TWISTER missile defence system and Main Ground Combat System. These programmes offer opportunities for multinational collaboration, building on national defence industrial champions, thus pointing to the gradual transformation of EDTIB, making it efficient, competitive and offering cutting-edge products in the long term.

Practically, these goals are inherently conflicting. The goal of procuring state-of-the-art military equipment (Goal 1) may fuel the destabilisation of regional arms races, contradicting the fundamental aim of Member States conducting armed forces development, namely ensuring higher levels of security. Pursuing “security of supply” in procurements (Goal 2) by prioritising domestic defence industries in development and production may conflict with “value-for-money” imperatives (Goal 4) to buy cheaper foreign products available in shorter timescales off-the-shelf. Similarly, seeking “indirect” national benefits (Goal 3) by engaging with domestic defence firms may contradict economic efficiency (Goal 4) pursued by procurements from international markets, taking advantage of open competition.<sup>65</sup> These contradictions remain relevant in the 2020s, when the current, perhaps only short-term, enabling conditions offer a chance to reform and empower the European defence industry.

Considering these influencing factors, States can rely on alternative weapons acquisition strategies, ranging from self-sufficiency through collaboration to licenced production/co-production and off-the-shelf procurement (Figure 6).

<sup>65</sup> Uttley, 2018, pp. 76–77.

Figure 6: Alternative national strategies of weapons acquisitions<sup>66</sup>

Self-sufficiency	Collaboration	Licensed production / Co-production	Off-the-shelf procurement
Indigenous research, development and production	Joint research, development and production	No indigenous research and development Indigenous manufacturing	No indigenous development or production

*Self-sufficiency*



*Technological dependence on other States*

These strategies can be modelled on a spectrum between self-sufficiency and off-the-shelf procurement, in order of decreasing national independence and domestic national industrial activity. Self-sufficiency is a strategy followed by the most advanced and capable Tier-1 defence economies in particularly important, technologically-advanced sectors, such as space, aviation and nuclear technology.<sup>67</sup> International collaborations can build on the pooling and sharing of R&D and production costs of new weapons systems with other advanced state producers.<sup>68</sup> Licensed production/co-production makes it possible to avoid domestic research and development because manufacturing technologies designed elsewhere are used under a licence in domestic production.<sup>69</sup> The strategy that is most dependent on other producers is off-the-shelf procurement, which eludes domestic R&D and production costs by importing complete weapons systems from abroad. However, as many examples from the past two decades' procurement and production practices demonstrate, "security of supply" and considerations favouring national defence industrial base have been predominating the choices between procurement strategies as opposed to non-national sources of equipment supply.

As mentioned in EDA annual assessments,<sup>70</sup> this limits the extent of cooperation and internationalisation of defence industrial supply, including R&D. Although technically, defence procurements are subject to the common provisions of European procurement law, as provided in the Treaty on the Functioning of the European Union (TFEU), Directive 2009/43/EC and Directive 2009/81/EC, Member States regularly refer to the exception provided by Article 346 TFEU, permitting them to take necessary measures to protect their essential security interests, that is, allowing them to not abide by the Common European Procurement Law. Consequently, the

66 Dorman et al., 2015, p. 25.

67 Such as Saab Gripen or Dassault Rafale fighter aircraft being national air force models sold to foreign customers as well.

68 Such as Eurofighter Typhoon produced in collaboration with BAE Systems, Airbus, Alenia Aermacchi and DASA within Eurofighter GmbH.

69 Such as the assembly and later the production of Lynx infantry fighting vehicles in Hungary.

70 European Defence Agency, 2023.



costs of procuring “non-European” in defence was estimated to range between 26 and 130 billion euros already in 2013.<sup>71</sup> Ten years later, the European Parliamentary Research Service estimated that the potential gains of “choosing European” in the 2020s could be between 24.4 billion and 75.5 billion euros annually (Table 3).<sup>72</sup>

*Table 3: The breakdown of possible financial gains through more European cooperation in defence<sup>73</sup>*

Main category		Moderate approach (billion euros)	Ambitious approach (billion euros)
1. Common capacity not created otherwise	Deployable troops	–	32
	R&D	–	6.4
2. Efficiency gains	Efficiency gains in industrial production	14.2	14.2
	Efficiency gains in land forces	1.3	1.3
	Efficiency gains in air force	0.2	0.2
	Efficiency gains in navy	0.5	0.5
	Efficiency gains in logistical support	0.4	0.4
3. Lower administrative costs	Procurement	–	12.7
4. Integration of externalities	Savings on offsets	7.8	7.8
<b>Total</b>		<b>24.4</b>	<b>75.5</b>

**4.2. EDTIB’s prime actors’ place in the global defence industry**

Although defence industrial collaboration in R&D and production, as well as joint procurement, would be a logical step to efficiently use economies of scale, to share resources and know-how, thus boosting competitiveness and the technological edge of European products internationally, such initiatives have only been a limited choice among European countries in the past decades. This can be attributed

71 Ballester, 2013, p. 8.

72 European Parliamentary Research Service, 2023, p. 314.

73 European Parliamentary Research Service, 2023, p. 314.

to national – economic, technological and often political – interests being contradictory, especially because EDTIB is largely fragmented and comprises various producers with diverse levels of technological advancement, capitalisation, capabilities in production, know-how and skilled employees, as well as relying on diverse supply chains.

Bitzinger classified States into a three-tier hierarchy in terms of their indigenous capacity to develop and produce advanced weapons.<sup>74</sup> The “First Tier” of arms-producing States, including the United States, United Kingdom, France, Germany, Italy, Israel, Russia – and today China – possess the world’s largest and most technologically-advanced defence industries. The domestic defence industries in these States collectively account for approximately 90% of global armament production. They dominate the global defence R&D process and have the resources and capacity to sustain self-sufficiency across some or all weapons development and production sectors. The “Second Tier” comprises a diverse range of countries. Some possess small but sophisticated arms industries (e.g. Austria, Canada, Sweden), while others are developing or newly industrialised countries (e.g. Brazil, South Africa, Republic of Korea, Turkey and gradually Poland). India currently fits into the group of Great Powers, having a large, broad-based defence industry but lacking domestic capacity to develop and produce sophisticated conventional arms. The “Third Tier” includes States that possess limited and low-technology arms-production capability, such as Egypt, Mexico and Nigeria. The remaining States in the international system lack the means to develop or produce weapons systems, therefore rely on arms imports and other forms of inward technology transfer to meet their military equipment requirements.

EU Member States comprise countries from all tiers with varying degrees of the ability to advocate their industrial interests. According to Lian et al., 26 EU arms companies were among the Top 100 arms producing and military services companies in 2022, with their combined arms revenue at 121 billion dollars. Among them, a U.K.-based company (BAE Systems) figured in the Top 10, along with six British, five French, four German, three trans-European, two Italian and other companies (Table 3). Trans-European companies included Airbus (ranked 14<sup>th</sup>, with arms revenues at 12.1 billion dollars), MBDA (32<sup>nd</sup>, 4.4 billion dollars) and KNDS (44<sup>th</sup>, 3.2 billion dollars). In comparison, 42 American (302.6 billion dollars), 8 Chinese (108 billion dollars) and 2 Russian (20.8 billion dollars) companies were listed in the Top 100, signalling strong American dominance. The most successful portfolios of European companies include air defence systems, anti-ballistic missile systems, armoured vehicles and ammunition.<sup>75</sup>

<sup>74</sup> Bitzinger, 2003, pp. 6–7, current updates added by the author.

<sup>75</sup> Liang et al., 2023, pp. 9–11.

*Table 4: Top EU defence companies by revenue in 2022<sup>76</sup>*

Company	Country	Revenue (billion USD)*	Global ranking
BAE Systems	United Kingdom	26.9	6.
Leonardo	Italy	12.47	13.
Airbus	Trans-European	12.09	14.
Thales	France	9.42	17.
Dassault Aviation	France	5.07	23.
Rolls-Royce	United Kingdom	4.93	25.
Rheinmetall	Germany	4.55	28.
Naval Group	France	4.53	29.
MBDA	Trans-European	4.38	32.
Safran	France	4.2	34.

European defence industrial production capacities are unevenly distributed among Member States; the largest ones account for approximately 80%, with an estimated turnover of 100+ billion euros. A relatively fewer number of large companies (a few dozen) and over 2,000 small-and-medium enterprises (SMEs) in the production chain form the backbone of this sector.<sup>77</sup> EDA estimated that in 2021, 196,000 highly-skilled people were directly employed in the industry, indirectly supporting over 315, 000 jobs.<sup>78</sup> European SMEs active in the defence and security industry are typically local-based, nationally linked at some point in the large corporate supply chain, and highly dependent, even vulnerable, to economic-financing problems. This group of small businesses was understandably severely affected by the resource constraints of the first half of the 2010s; therefore, it must be ensured that they remain viable within national and EU frameworks and resources in the 2020s. Technological know-how of the entire production chain is clearly of strategic importance, and these building blocks are needed if the EU is to secure strategic autonomy at any time in the future.

For decades, this defence industrial base has been leading the world in terms of its R&D potential and manufacturing capacity, whether for military or dual-use

<sup>76</sup> Source of data: Ibid. The table was compiled by the author.

\*: Revenues from arms production and sales in 2022.

<sup>77</sup> European Court of Auditors, 2019, p. 43.

<sup>78</sup> European Parliament, 2023.

technologies. In addition, the activities of the largest defence industry companies are global in scope – an approach that clearly shows a loss of ground for emerging competitors. While these companies accounted for nearly 30% of the global share after the turn of the millennium, by the end of the 2010s, their share had fallen below 25%, while the share of non-Western (non-EU, non-U.S.) defence industrial companies increased from 9% to 19%.<sup>79</sup> As the largest customers of European defence industrial products are EU Member States, their budgetary constraints directly affect their market opportunities. This highlights that both the demand and supply sides are vulnerable – and can offset their ability to compete in international arms trade. Given that the results of defence R&D can be measured in decades, while the present results are ensured by decisions made decades ago, it is important to consider the severe resource cuts in this area in the 2010s, from which the sector has yet to recover.

Moreover, the Russo-Ukrainian War revealed further shortcomings for the EDTIB in terms of meeting the increased short-term demand for arms and military stocks, particularly for ammunition and air defence missiles. The past two years have raised questions about the European industry’s ability to support Ukraine militarily at scale and speed, and its ability to recapitalise forces in NATO and the EU.<sup>80</sup> For example, BAE Systems estimated that restarting the production of M777 howitzers would take 30–36 months; Rheinmetall deemed 8–12 months necessary for the production of specialised steel for tank armour, while the delivery time of unguided 155 mm artillery shells was 10–20 months, and 24–36 months for guided shells in 2022. It is estimated that in high-intensity conflict, the United Kingdom’s ammunition stocks would last around eight days, while Bundeswehr would run out of ammunition somewhere between a few hours and a few days, as they only count on stocks of 20,000 155 mm artillery shells – enough for less than three days of high-intensity combat in Ukraine. In 2022, France produced an equivalent of these shells for a week of fire during World War II.<sup>81</sup>

### ***4.3. Constraints and opportunities for EDTIB in the 2020s***

An overview of the European defence industrial sectors reveals that aerospace is characterised by a relatively high level of cooperation and integration compared with other sectors. In recent decades, a significant number of bilateral to multilateral collaborative programmes have taken place in the EU, such as the A400M transport aircraft, NH90 multirole helicopter, Eurocopter Tiger attack helicopter, Eurofighter Typhoon fighter aircraft, MALE RPAS drone and the Meteor air-to-air missile. However, programme duplications have occurred, for example,

<sup>79</sup> European Court of Auditors, 2019, pp. 49–50.

<sup>80</sup> Aries, Giegerich and Lawrenson, 2023, p. 7.

<sup>81</sup> Data from Aries, Giegerich and Lawrenson, 2023, p. 9; Calcara, Gilli and Gilli, 2023, p. 635.

fighter aircraft such as Rafale, Gripen and Eurofighter.<sup>82</sup> The European aerospace sector can deliver advanced military capabilities and cutting-edge technologies independently, such as combat aircraft, helicopters, missiles, strategic airlift and tanker aircraft. This branch is comparatively well positioned in the global market, with top players sustaining strong export records, such as Rafale and Eurofighter aircraft, Eurocopter and various types of MBDA missiles. However, the market continues to be dominated by leading American companies, such as Lockheed Martin and Boeing, returning to European markets and taking a significant share of the F-35 Joint Strike Fighter after the decades-long success of F-16 variants.<sup>83</sup> Meanwhile, there are certain shortcomings in air and missile defences: despite existing – though partial – European solutions such as SAMP/T, and IRIS-T air-to-air missiles, the comprehensive European Sky Shield Initiative also builds Patriot for long-range and Arrow 3 for very-long-range missile defence (sidelining SAMP/T). The aerospace sector is highly R&D-intensive (up to 30% of the total cost of a combat aircraft) and is strongly interconnected with civilian aviation. Therefore, with a few exceptions, such as BAE Systems, MBDA and Saab, leading companies are involved in dual-use activities and are not fully dependent on the defence sector.<sup>84</sup>

The land armament industry is less concentrated than the aerospace segment. Here, the main integrators are concentrated in the “Letter of Intent” group<sup>85</sup>: France, Germany, Italy, Spain, Sweden and the United Kingdom, while SMEs play a substantial role as subcontractors and specialised product suppliers operating in niche markets. Compared to the aerospace industry, the land armament industry is relatively more defence-dependent but less R&D-intensive, with typically less than 15% associated with R&D costs.<sup>86</sup> In addition, there are fewer dual-use opportunities. Collaborative projects have been very limited, such as the German–Dutch armoured fighting vehicle Boxer or the Krauss-Maffei Wegmann–Nexter merger into KNDS, bringing about an important step in industrial consolidation. The sector is characterised by the duplication of capabilities along national borders.

82 Research costs and the cost effectiveness of production greatly determine competitiveness. The research costs of the Eurofighter were said to be 19.48 billion euros, surpassing even that of F-35 with 19.34 billion euros. However, for this similar R&D investment 707 Eurofighters and 3003 F-35s were envisaged to be produced. Briani, 2013, p. 16.

83 Currently there are 142 F-35 variants in service in Europe (10 in Denmark, 26 in Italy, 34 in the Netherlands in the EU, plus 40 in Norway, 32 in the United Kingdom). Additional 64 F-35s have been contracted by Finland, 34 by Belgium, 32 by Poland, 35 by Germany, 24 by the Czech Republic and 36 by Switzerland. The procurement of further 40 aircraft is being negotiated with Greece.

84 European Court of Auditors, 2019, p. 68.

85 The “Letter of Intent” group was formed in 2000 to create the political and legal frameworks necessary to facilitate industrial restructuring to promote a more competitive and robust EDTIB in the global defence market. This aim should be realised through tackling challenges in six broad areas: security of supply, transfer/export procedures, security of information, research, treatment of technical information and harmonisation of military requirements.

86 European Court of Auditors, 2019, p. 68.

Currently, there are 49 design families of armoured fighting vehicles and 11 design families of tanks in operation in the EU. Opportunities for further collaboration exist with the European Main Battle Tank and a future artillery system developed by France and Germany, as the sector can design, manufacture, upgrade and support key military capabilities for land warfare. These also include armoured fighting vehicles, ammunition, precision munitions, artillery systems and missile launchers. Producers perform strongly in global exports, like the Leopard main battle tank and various armoured vehicles. However, competition in the global market involves ever more players than traditional Tier-1 manufacturers (such as the United States, Russia, Israel and South Korea), as Tier-2 countries (Turkey and India) also develop their indigenous defence industries. The competitiveness of the EU industry is affected by the relatively small size of the main European companies compared to American companies. The Russo-Ukrainian War also revealed shortcomings in European production capacities in several areas of the land domain, such as ammunition production, anti-tank-guided missiles, artillery and demining equipment.

The European naval industry is concentrated around six major companies that serve as prime contractors and system integrators. These can design, integrate and produce an entire range of key capabilities, from ships to almost all core systems and components up to, aircraft carriers and nuclear-capable submarines. Major producers rely on diverse supply chains comprising many specialised suppliers, and there is no dependency on non-EU countries for critical systems, even after Brexit. This sector is highly competitive in international markets, especially in high value-added segments such as submarines, destroyers and frigates. However, the naval sector remained organised along national borders, with 60–80% of materials, components and systems sourced at the national level by prime contractors. This increased to 95% when taking into account EU cooperation in the supply chain. Experience with EU collaborative projects has been limited in the naval sector, and mainly took place on a bilateral basis, such as the *Fromme* multipurpose frigate developed by France and Germany. With growing competition from China and South Korea, the naval sector is increasingly dependent on exports.<sup>87</sup>

The SWOT analysis of EDTIB summarises the constraints and opportunities for the 2020s (Table 5).

<sup>87</sup> European Court of Auditors, 2019, p. 68.

Table 5: SWOT analysis of EDTIB<sup>88</sup>

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>– Presence of European leaders in global markets</li> <li>– Capacity to design and produce a wide range of military products in aerospace, land, naval and electronic segments</li> <li>– Experience in multinational cooperation (particularly in the aerospace sector)</li> <li>– Highly skilled workforce</li> </ul>	<ul style="list-style-type: none"> <li>– Fragmented defence market with excess capacity in certain areas, duplications and missed economies of scale</li> <li>– <i>Limited production capacities in other areas (ammunition, missile technology, air defence, land vehicles)</i></li> <li>– Increasing costs of defence equipment and systems</li> <li>– Relatively low-level of R&amp;D expenditures</li> <li>– Lack of collaborative defence procurements and R&amp;D (<i>initially addressed by EDF and EDIRPA, later by EDIP</i>)</li> <li>– Divergence in EU Member States’ export policies</li> <li>– Limited access to cross-border markets within the EU, in particular for SMEs (<i>addressed by PESCO and EDF</i>)</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>– Growth in global and European military expenditures</li> <li>– Large-scale demand from European countries both for supporting Ukraine, replenishing their own stocks and</li> <li>– Momentum for EU defence cooperation supported by (<i>most</i>) Member States (<i>and EU institutions</i>)</li> <li>– Launch of large new collaborative programs (FCAS, Euro drone MALE, European Main Battle Tank, <i>Tempest, European Sky Shield Initiative</i>)</li> <li>– Potential for rationalisation and restructuring, particularly in the land and naval sectors</li> <li>– Dual-use technologies and growing interaction with the civilian sector</li> </ul>	<ul style="list-style-type: none"> <li>– Competition from traditional and emerging competitors</li> <li>– Loss of innovative capacity and technological superiority, hindering global competitiveness</li> <li>– Security of supply with increased dependency on international and complex supply chains</li> <li>– No preference for using EU suppliers by member states</li> <li>– High entry barriers in non-EU market</li> </ul>

88 European Court of Auditors, 2019, p. 69. Emphasis in italics, signalling additions, were added by the author.

## 5. Conclusions: squaring the circle between short-term readiness and long-term innovation

As European countries adapt their procurement plans to move from the previous crisis management phase dominated by asymmetric warfare against small States and non-State actors to an era of strategic competition and potential conflict against peer adversaries, there are several structural issues that EDTIB must address. On the demand side, there is a short-term request for the replenishment of state-of-the-art arms and ammunition stocks, as well as for procuring new modern equipment to replace legacy assets provided for Ukraine in 2022–2023. Second, for the mid-term, the ongoing weapons development programmes and production contracts must be realised, sometimes even upgraded in numbers and/or quality, reflecting the technological lessons learnt from the Russo-Ukrainian War. Third, in the long-term, investment-intensive research and development, and innovation in emerging and disruptive technologies, such as autonomous systems, AI, quantum computing, hypersonic systems, space, novel materials and manufacturing, energy and propulsion, next-generation communications systems, biotechnologies and human enhancements need to be addressed by EDTIB not only to keep pace with global competitors, but also to maintain competitiveness and develop a new technological edge.

To meet these demands on the supply side, the defence industry reacted with the extension of working hours, introducing new shifts to increase production levels for existing lines, and started to invest in and introduce further production capacities, such as opening new lines, extending facilities, even building new arms factories in Europe (planned to be extended soon to Ukraine), and further acquisitions and mergers. New major investments may begin to yield results within a few years, as shown by the protracted introduction of extra ammunition production capacity since 2022. The EU also attempts to live up to the changed circumstances, introduce new applications for existing programmes (EDF, EPF) and establish new incentives (ASAP, EDIRPA, EDIP). The EDIS, with all supporting mechanisms – and hopefully also building upon the strong commitment of Member States – should enable the EU to address these long-term issues.

However, when current incentives for short-term defence procurement and readiness collide with long-term structural investment, consolidation and innovation, there is an inevitable trade-off. Limited resources make this balancing a challenge, independent of the actual outcome of the Russo-Ukrainian War, because resources are now being committed to mid-to-long-term contracts. While EDIRPA only encourages consolidation of the demand side, EDIP should focus on supporting the supply side by creating a framework favourable to the development of the European defence industry, enabling it to produce more, better and faster.<sup>89</sup>

<sup>89</sup> Schnitzler, 2023, p. 3.



## References

- Anderson, J.J., Biscop, S., Giegerich, B., Mölling, C., Tardy, Th. (2016) *Envisioning European defence. Five futures*. Chaillot Paper No. 137, Paris: EUISS; <https://doi.org/10.2815/83614>.
- Andersson, J.J., Cramer, C.S. (2023) *EUISS Yearbook of European Security 2023*. Luxembourg: Publications Office of the European Union; <https://doi.org/10.2815/168634>.
- Aries, H., Giegerich, B., Lawrenson, T. (2023) 'The guns of Europe: Defence-industrial challenges in a time of war', *Survival*, 65(3), pp. 7–24; <https://doi.org/10.1080/00396338.2023.2218716>.
- Ballester, B. (2013) *The Cost of non-Europe in Common Security and Defense Policy*, Brussels: European Union Research Service; <https://doi.org/10.2861/28157>.
- Barrie, D., Béraud-Sudreau, L., Boyd, H., Childs, N., Giegerich, B., Hackett, J., Nouwens, M. (2020) *European defence policy in an era of renewed great-power competition*. IISS – Hanns Seidel Foundation. [Online]. Available at: <https://www.iiss.org/globalassets/media-library---content-migration/files/research-papers/european-defence-policy-in-an-era-of-renewed-great-power-competition---iiss-research-report.pdf> (Accessed: 10 December 2023).
- Bergmann, M., Besch, S. (2023) 'Why European defense still depends on America', *Foreign Affairs*, 7 March 2023. [Online]. Available at: <https://www.foreignaffairs.com/ukraine/why-european-defense-still-depends-america> (Accessed: 10 December 2023).
- Bergmann, M., Svendsen, O. (2023) *Transforming European Defense. A new focus on integration*. Washington, DC: CSIS. [Online]. Available at: <https://www.csis.org/analysis/transforming-european-defense-new-focus-integration> (Accessed: 10 December 2023).
- Bitzinger, R. (2003) 'Towards a brave new arms industry?', *The Adelphi Papers*, 43(356), pp. 63–79; <https://doi.org/10.1080/714027876>.
- Briani, V. (2013) *The cost of non-Europe in the defense field*. Rome: Centre for Studies on Federalism – IAI. [Online]. Available at: [https://www.iai.it/sites/default/files/CSF-IAI\\_noneurope defence\\_april2013.pdf](https://www.iai.it/sites/default/files/CSF-IAI_noneurope defence_april2013.pdf) (Accessed: 10 December 2023).
- Calcara, A., Gilli, A., Gilli, M. (2023) 'Short-term readiness, long-term innovation: the European defense industry in turbulent times', *Defence Studies*, 23(4), pp. 626–643; <https://doi.org/10.1080/14702436.2023.2277439>.
- Čížik, T. (2020) 'Security perception and security policy of the Slovak Republic, 1993–2018', *Defense and Security Analysis*, 37(1), pp. 23–37; <https://doi.org/10.1080/14751798.2020.1831228>.
- Commijs, K. (2020) 'Kabinet doet te weinig om kernwapenverdrag te redden' [Cabinet does too little to save nuclear arms treaty], *Trouw*, 31 January 2020. [Online]. Available at: <https://www.trouw.nl/nieuws/kabinet-doet-te-weinig-om-kernwapenverdrag-te-redden~b39d3ec4/> (Accessed: 10 December 2023).
- Council of the European Union (2013) 'Conclusions, 19/20 December 2013', 20 December. [Online]. Available at: <https://data.consilium.europa.eu/doc/document/ST-217-2013-INIT/en/pdf> (Accessed: 10 December 2023).
- Council of the European Union (2021) 'Council Conclusions on Security and Defense, Outcome of Proceedings', 10 May. [Online]. Available at: <https://data.consilium.europa.eu/doc/document/ST-8396-2021-INIT/en/pdf> (Accessed: 10 December 2023).
- Council of the European Union (2022a) 'A Strategic Compass for Security and Defense', 21 March. [Online]. Available at: <https://data.consilium.europa.eu/doc/document/ST-7371-2022-INIT/en/pdf> (Accessed: 10 December 2023).

- Council of the European Union (2022b) 'Informal meeting of the Heads of State and Government – Versailles Declaration', 11 March. [Online]. Available at: <https://www.consilium.europa.eu/media/54773/20220311-versailles-declaration-en.pdf> (Accessed: 10 December 2023).
- Council of the European Union (2024) *European Peace Facility*. [Online]. Available at: <https://www.consilium.europa.eu/en/policies/european-peace-facility/> (Accessed: 30 January 2024).
- Csernaton, R. (2021) *The EU's Defense Ambitions: Understanding the Emergence of a European Defense Technological and Industrial Complex*. Brussels: Carnegie Europe. [Online]. Available at: <https://carnegieendowment.org/research/2021/12/the-eus-defense-ambitions-understanding-the-emergence-of-a-european-defense-technological-and-industrial-complex?lang=en&center=europe> (Accessed: 10 December 2023).
- Csiki, T. (2014) 'Az Európai Tanács közös biztonság- és védelempolitikai csúcstalálkozójának háttere és eredményének értékelése' [The background and analysis of the EU Council summit on common security and defense policy], *Nemzet és Biztonság – Biztonságpolitikai Szemle*, 7(1), pp. 48–63.
- Csiki, T., Tálas, P., Varga, G. (2014) 'A NATO walesi csúcstalálkozójának napirendje és értékelése' [The agenda and analysis of NATO's Wales summit], *Nemzet és Biztonság – Biztonságpolitikai Szemle*, 7(2), pp. 112–128.
- Dorman, A., Uttley, M., Wilkinson, B. (2015) *A benefit, not a burden*. King's Policy Institute Paper, London: King's College London.
- European Commission (2022a) 'Commission contribution to European defense' COM(2022) 60 final, Strasbourg, 15 February. [Online]. Available at: [https://commission.europa.eu/document/download/d53b0f4f-939f-4044-ab16-e8fc44d35b84\\_en?filename=com\\_2022\\_60\\_1\\_en\\_act\\_contribution\\_european\\_defence.pdf](https://commission.europa.eu/document/download/d53b0f4f-939f-4044-ab16-e8fc44d35b84_en?filename=com_2022_60_1_en_act_contribution_european_defence.pdf) (Accessed: 10 December 2023).
- European Commission (2022b) 'Defense Investment Gaps Analysis and Way Forward' JOIN(2022) 24 final, Brussels, 18 May. [Online]. Available at: [https://commission.europa.eu/system/files/2022-05/join\\_2022\\_24\\_1\\_en\\_annexe\\_autre\\_acte\\_conjoint\\_cp\\_part1\\_v1.pdf](https://commission.europa.eu/system/files/2022-05/join_2022_24_1_en_annexe_autre_acte_conjoint_cp_part1_v1.pdf) (Accessed: 10 December 2023).
- European Court of Auditors (2019) 'European Defence, Review No. 09.', 22 March. [Online]. Available at: [https://www.eca.europa.eu/lists/ecadocuments/rew19\\_09/rew\\_eu-defence\\_en.pdf](https://www.eca.europa.eu/lists/ecadocuments/rew19_09/rew_eu-defence_en.pdf) (Accessed: 1 February 2024).
- European Defense Agency (2020) '2020 CARD Report – Executive Summary'. [Online]. Available at: <https://www.eda.europa.eu/docs/default-source/reports/card-2020-executive-summary-report.pdf> (Accessed: 10 December 2023).
- European Defense Agency (2022) '2022 Coordinated Annual Review on Defence Report', 16 November. [Online]. Available at: <https://eda.europa.eu/docs/default-source/eda-publications/2022-card-report.pdf> (Accessed: 10 December 2023).
- European Defense Agency (2023) 'Defense Data 2022. Key findings and analysis', 29 November. [Online]. Available at: [https://eda.europa.eu/docs/default-source/brochures/2022-eda\\_defencedata\\_web.pdf](https://eda.europa.eu/docs/default-source/brochures/2022-eda_defencedata_web.pdf) (Accessed: 10 December 2023).
- European External Action Service (2022) *A Strategic Compass for Security and Defense*. [Online]. Available at: [https://www.eeas.europa.eu/sites/default/files/documents/strategic\\_compass\\_en3\\_web.pdf](https://www.eeas.europa.eu/sites/default/files/documents/strategic_compass_en3_web.pdf) (Accessed: 10 December 2023).
- European External Action Service (2024) 'EU Assistance to Ukraine (in U.S. Dollars)', 24 April. [Online]. Available at: [https://www.eeas.europa.eu/delegations/united-states-america/eu-assistance-ukraine-us-dollars\\_en?](https://www.eeas.europa.eu/delegations/united-states-america/eu-assistance-ukraine-us-dollars_en?) (Accessed: 10 December 2023).

- European Investment Bank (2022) 'The EIB continues its support to the EU's Security and Defense Agenda', 10 March 2022. [Online]. Available at: <https://www.eib.org/en/press/all/2022-123-the-eib-continues-its-support-to-the-eu-s-security-and-defence-agenda> (Accessed: 10 December 2023).
- European Investment Bank (2023) 'EIB pledges record funding for Europe's security infrastructure, vows more support for Ukraine', 16 June 2023. [Online]. Available at: <https://www.eib.org/en/press/all/2023-227-eib-pledges-record-funding-for-europe-s-security-infrastructure-vows-more-support-for-ukraine> (Accessed: 10 December 2023).
- European Parliament (2023) 'Reinforcing the European defense industry', June 2023. [Online]. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/749805/EPRS\\_BRI\(2023\)749805\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/749805/EPRS_BRI(2023)749805_EN.pdf) (Accessed: 10 December 2023).
- European Parliamentary Research Service (2023) 'Increasing European added value in an age of global challenges. Mapping the costs of non-Europe (2022-2032)', February 2023. [Online]. Available at: [https://www.europarl.europa.eu/RegData/etudes/STUD/2023/734690/EPRS\\_STU\(2023\)734690\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/734690/EPRS_STU(2023)734690_EN.pdf) (Accessed: 10 December 2023).
- Fiott, D. (2023) 'In every crisis an opportunity? European Union integration in defense and the War on Ukraine', *Journal of European Integration*, 45(3), pp. 447–462; <https://doi.org/10.1080/07036337.2023.2183395>.
- Fiott, D., (2024) *The EU Defense Industrial Strategy: Some preliminary reflections*. [Online]. Available at: <https://danielfiott.com/2023/10/21/the-eu-defence-industrial-strategy-some-preliminary-reflections/> (Accessed: 10 December 2023).
- IISS (2023) *Military Balance+ database*. [Online]. Available at: <https://milbalplus.iiss.org/default.aspx?> (Accessed: 10 December 2023).
- Karsenti, M. (2023) 'Armement français: "Notre outil industriel ressemble plus à de l'artisanat de luxe qu'à une industrie de défense"' [French armament: "Our industrial base is more like a luxury craft industry than a defense industry"], *Marianne*, 23 February 2023. [Online]. Available at: <https://www.marianne.net/societe/defense/armement-francais-notre-outil-industriel-ressemble-plus-a-de-lartisanat-de-luxe-qua-une-industrie-de-defense> (Accessed: 10 December 2023).
- Kříž, Z. (2020) 'The security perception and security policy of the Czech Republic, 1993–2018', *Defense and Security Analysis*, 37(1), pp. 38–52; <https://doi.org/10.1080/14751798.2020.1831231>.
- Liang, X., Scarazzato, L., Béraud-Sudreau, L., Tian, N., Lopes-Da Silva, D., Choi, Y., Sild, E.-K. (2023) 'The SIPRI Top 100 arms-producing and military service companies, 2022', *SIPRI Fact Sheet*, December 2023. [Online]. Available at: [https://www.sipri.org/sites/default/files/2023-11/fs\\_2312\\_top\\_100\\_2022.pdf](https://www.sipri.org/sites/default/files/2023-11/fs_2312_top_100_2022.pdf) (Accessed: 20 December 2023).
- Maulny, J.-P. (2023) 'The impact of the war in Ukraine on the European defense market', *Institute de Relations Internationales et Stratégiques*, September 2023. [Online]. Available at: [https://www.iris-france.org/wp-content/uploads/2023/09/19\\_ProgEuropeIndusDef\\_JPMaulny.pdf](https://www.iris-france.org/wp-content/uploads/2023/09/19_ProgEuropeIndusDef_JPMaulny.pdf) (Accessed: 10 December 2023).
- Mölling, C., Brune, S. (2011) *The Impact of the Financial Crisis on European Defence*. Brussels: European Parliament. [Online]. Available at: <https://www.europarl.europa.eu/document/activities/cont/201106/20110623ATT22404/20110623ATT22404EN.pdf> (Accessed: 10 December 2023).
- Nádudvari, A. (2020) 'Az európai védelmi kezdeményezések törésvonalai' [The fault lines in European defense initiatives], *Nemzet és Biztonság – Biztonságpolitikai Szemle*, 13(1), pp. 111–131; <https://doi.org/10.32576/nb.2020.1.7>.

- NATO (2023) 'Madrid Summit Declaration' *Press Release*, 22 June 2022. [Online]. Available at: [https://www.nato.int/cps/en/natohq/official\\_texts\\_196951.htm](https://www.nato.int/cps/en/natohq/official_texts_196951.htm) (Accessed: 10 December 2023).
- Oryx (2024) 'Answering the call: Heavy weaponry supplied to Ukraine', 11 April 2022. [Online]. Available at: <https://www.oryxspioenkop.com/2022/04/answering-call-heavy-weaponry-supplied.html> (Accessed: 01 February 2024).
- Palczewska, M. (2020) 'The security perception and security policy of Poland, 1989–2017', *Defense and Security Analysis*, 37(1), pp. 80–95; <https://doi.org/10.1080/14751798.2020.1831237>.
- Sabatino, E., Fiott, D., Zandee, D., Mölling, C., Major, C., Maulny, J., Keohane, D., Moro, D. (2020) *The Quest for European Strategic Autonomy – A Collective Reflection*. IAI. [Online]. Available at: <https://www.iai.it/sites/default/files/iai2022.pdf> (Accessed: 10 December 2023).
- Sarcinchi, A. (2020) 'Security perception and security policy in Romania since the 1989 Revolution', *Defense and Security Analysis*, 37(1), pp. 96–113; <https://doi.org/10.1080/14751798.2020.1831239>.
- Schnitzler, G. (2023) *EDIRPA/EDIP: Risks and opportunities of future joint procurement incentives for the European defense market*. ARES Policy Paper No. 81.
- SIPRI (2023) *SIPRI Military Expenditure Database*. [Online]. Available at: <https://www.sipri.org/databases/milex> (Accessed: 10 December 2023).
- Uttley, M. (2018) 'Defence procurement' in Galbreath, D.J., Deni, J.R. (eds.) *Routledge Handbook of Defence Studies*. 1st edn. London: Routledge, pp. 72–86; <https://doi.org/10.4324/9781315650463-7>.
- U.S. Department of State (2021) 'European Recapitalization Incentive Program (ERIP)', 6 December. [Online]. Available at: <https://www.state.gov/european-recapitalization-incentive-program-erip/> (Accessed: 10 December 2023).
- Wall, C., Christianson, J. (2023) 'Europe's missing piece: The case for air domain enablers', *CSIS Briefs*, April 2023. [Online]. Available at: [https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-04/230417\\_Wall\\_European\\_Enablers.pdf?](https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-04/230417_Wall_European_Enablers.pdf?) (Accessed: 10 December 2023).
- Zubascu, F. (2024) 'Horizon Europe budget to be cut by €2.1B, as defense research gets a €1.5B boost', *Science|Business*, 1 February 2024. [Online]. Available at: <https://sciencebusiness.net/news/horizon-europe/horizon-europe-budget-be-cut-eu21b-defence-research-gets-eu15b-boost> (Accessed: 1 February 2024).