

Finabel



Convergences and Divergences:

Unravelling the Challenges and Opportunities of the Future Combat Aircraft of Europe, a key element for European Interoperability



AN EXPERTISE FORUM CONTRIBUTING TO EUROPEAN ARMIES INTEROPERABILITY SINCE 1953



Written by Gonzalo Vidal
Edited by Piotr Kosik
Supervised by Cecilia Rosa Yáñez

This Food for Thought paper is a document that gives an initial reflection on the theme. The content is not reflecting the positions of the member states but consists of elements that can initiate and feed the discussions and analyses in the domain of the theme. All our studies are available on www.finabel.org

DIRECTOR'S EDITORIAL

Due to the ongoing Russian-Ukraine war, Europe's security architecture finds itself at a critical juncture of transformation. Consequently, Europe must confront its challenges and cultivate robust deterrence and defence capabilities through enhanced collaboration among all European nations, surpassing existing alliances. In this context, Europe has been striving for interoperability across various domains of security and defence, a response to the continent's years of inadequate defence investments by several nations.

However, the current situation in the Ukraine conflict demands not only a prompt response but also sustained and deeper commitments to interoperability. This underscores the crucial role of advanced weaponry, necessitating substantial investments and enduring dedication to research and development. A case in point highlighting this intricate scenario is the state of combat air capabilities in Ukraine and Europe.

Ukraine presently relies on outdated Soviet-era airplanes, both domestically owned and donated by other European countries. On the European front, challenges related to the obsolescence of platforms like the Eurofighter pose a serious dilemma, forcing a choice between embracing American technology or forging a European solution.

Defence budgets are under intense scrutiny for more efficient spending, prompting countries to invest in comprehensive projects that serve multiple objectives. Consequently, collaborative combat aircraft projects must engage multiple nations, addressing various missions with judicious investments while navigating the diverse political and strategic goals of the involved actors.

This research aims to unravel the primary challenges associated with ongoing projects aimed at developing advanced combat air platforms in Europe. By scrutinising past collaborative experiences in Europe and studying the challenges and opportunities inherent in these projects, the research endeavours to provide a comprehensive analysis of how greater interoperability can be achieved in the realm of European defence.



Mario Blokken

Director PSec

TABLE OF CONTENTS

Director's Editorial	2
Introduction	4
Literature Framework	5
Future combat aircraft	7
Challenges	10
Bogged Projects	10
Fragmented industry	11
Past and Present Divergences	12
Autonomous Weapon Systems (AWS)	12
Opportunities	13
Interoperability	13
PESCO	14
EDF	14
EDIRPA	15
Conclusion	16
References	17

INTRODUCTION

The Russian war in Ukraine has reiterated the significance of air superiority in achieving war objectives (Bronk et al., 2022). “The war in Ukraine shows what fighting without air superiority looks like – massed armies relying on ground-based artillery firepower for their lethality, with hundreds of thousands of dead in the first year” (Bronk, 2023, paragraph 16). So, preventing long and deadly campaigns for Land Forces is critical for Europe, which strong air capabilities can accomplish.

The Western world and Russia have been on the vanguard of air combat technology for decades (Barrie et al., 2022). Since the end of the Cold War, many further countries have embarked on developing their aircraft capabilities, with China putting together one of the most severe efforts to counter Western technologies (Barrie et al., 2022). Nowadays, building advanced aircrafts requires heavy investment in technological warfare. It is also a simultaneous sign of geopolitical strength (Hemler, 2023; Roukoz, 2023).

Thus, the possession of self-made aircrafts is proof of having not only the industrial and financial capability to reach higher levels of defence autonomy, but also the will and determination to achieve such goals. In that regard, it is worth to analyse whether Europe has the capability and determination to achieve such a milestone in defensive capabilities as having a standard combat air system (European External Action Service, 2022).

The current combat aircrafts in Europe are diverse. European aircraft types derive from

either the European and American industries or the legacy soviet or Russian models (Stern & Morgunov, 2023). Such a diversity is not appropriate for a community aiming to act jointly to resolve global security dilemmas (Barrie et al., 2022). To fulfil the defence objectives meeting 21st century standards, Europe needs to develop a new fighter jet to decrease dependency on the United States.

To pursue those expectations, there are currently two projects in motion in where European countries are involved. The so-called SCAF/FCAS project, promoted initially by a French-German initiative, and the GCAP program originally driven by the United Kingdom. These projects have experienced different issues such as countries involved and delays in the design phase (Tran, 2023).

The European commitment to the projects in terms of budget is ambitious. According to the European Defence Fund indicative multiannual perspective 2021-2027, more than 10% of the total budget of the EDF is earmarked for the initiative without naming a particular project (European Commission, 2022). Thus, the document suggests that there will be European funding for a project. However, it will be heavily scrutinised.

Many European air combat system projects have experienced mixed results in terms of final development. Of the countries fully consummating the venture, the case of the Eurofighter is the only of any significant remark (Gilli & Gilli, 2017). Thus, although having its own fighter attack is essential for European

defence, its final development will face many challenges, as highlighted by this paper.

Therefore, the objective of the paper is to illustrate the main issues for the development of a Future Combat Aircraft in Europe, whether it is the German, French and Spanish Future Combat Air System (hereafter “FCAS”) or the United Kingdom’s, Italian and Japanese Global Combat Aircraft Program (GCAP) (Hemler, 2023). For that, it is vital to assess historical hurdles of previous projects, current news about the projects and future landscape for combat aircrafts in Europe.

The practical relevance of this paper is to enhance the interoperability of European armed forces by assessing the challenges hindering such a project. Meanwhile, understanding the project’s relevance in terms of funding and

industrial cooperation could be a significant leap for the European Industrial context in developing a culture of trust and collaboration.

In terms of research design, the first part of the paper will present the literature review of future combat aircraft, delving into the present inventory, the latest news about the two projects’ momentum and the strategic decisions regarding them. The following section will briefly review the relevance of creating a European Combat Aircraft and the window of opportunity related to its development. The subsequent chapters will display the challenges and opportunities of the projects. Finally, the paper will conclude by summarising major findings on the topic.

LITERATURE FRAMEWORK

An advanced combat aircraft for Europe is critical for its defence architecture and is considered “Europe’s most significant next-generation military development” (Barrie et al., 2022, p. 19). To achieve this objective, two current projects exist by which European countries seek to develop a sixth-generation fighter - the FCAS and GCAP (Magnuson, 2023).

The FCAS is a combined French-German-Spanish project to deliver a combat aircraft integrated with highly technologically developed systems displays (Roukoz, 2023). The companies involved in this project are Dassault from France, Airbus from Germany, and Indra from Spain (Roukoz, 2023).

GCAP is a project of the United Kingdom with Japan and Italy, involving BAE Systems, Leonardo UK, MBDA UK, Rolls-Royce from the UK, IHI Corporation, Mitsubishi Electric and Mitsubishi Heavy Industries in Japan and Avio Aero, Elettronica, Leonardo and MBDA in Italy (BAE Systems, n.d.)

Both major projects are facing difficulties sufficient to make them implode. For the FCAS, the divergencies between France and Germany regarding leadership and the fighter development are causing delays that may lead to favouring of opposing projects (Pons, 2023). For the GCAP, the size of the project and the costs associated are major hindrances (Bronk, 2023). Brexit has diminished the possibility

of accessing European funding (European Commission, 2021).

The setbacks of the two major projects are creating strategic challenges for all of Europe, not only for the constructors. Many countries are seeking to fill their gaps with options outside Europe. The incorporation of the F-35 into the inventories of several NATO-member air forces, including those of the United Kingdom, Italy, Finland, Denmark, Norway, the Netherlands, Belgium, and Poland, provides evidence of the problems that political and industrial indecision creates (Barrie et al., 2022).

The importance of having a self-made European combat aircraft is particularly relevant for geopolitical reasons (European External Action Service, 2022) and deterrence capabilities (Martini et al., 2023). The sheer number of combat aircraft supplier nations provides evidence of its geopolitical relevance. Moreover, the need to decrease the dependence on the United States for armaments (Roukoz, 2023; Bergmann *et al.*, 2022) and credibility of deterrence capabilities motivate the development of such weaponry (Martini et al., 2023, p. 76).

Through relevant instruments, Europe has exercised their will and commitment to the project. The strategic compass, the EDF guidelines, PESCO and EDIPRA are all instruments introduced to create a collaborative environment. However, a major issue results from their enactment by the European Union institutions, as it leaves the GCAP project with limited options due to Brexit.

Nevertheless, Europe and NATO have similar defence needs for achieving their deterrence objectives against Russia (Martini et

al., 2023). Hence, United Kingdom's efforts in the GCAP must be supported by Europe's industrial complex and funding environment, regardless of Brexit. However, due to the imperative goal of interoperability between the two projects, a merger could become a potential solution (Barrie et al., 2022).

Many prominent voices have suggested that the future may bring a joint aircraft as a result of the two big projects due to cost issues, the size of the market and the need for interoperability (Barrie et al., 2022; Tran, 2023; Le Gleut & Conway-Mouret, 2020). The UK's and France's leadership in the projects could help achieve collaboration. Take note of their current partnership in other projects, such as the future cruise antiship weapon programme (Vavasseur, 2023) that cooperation could be transported into the aircraft realm. Thus, with both countries having nuclear commitments to NATO, the air launch capabilities can be increased (North Atlantic Treaty Organization, 2022).

Germany is a key player entering a new stage regarding its position in Europe in terms of deterring threats (Barry et al., 2023). Germany, France, and the United Kingdom all have nuclear commitments to NATO (Germany Federal Government, 2023), which may be bolstered by the new combat aircraft in the future (Pons, 2023).

A significant caveat from the German side is its policy on arms export (Hemler, 2023). If the project seeks to be profitable, the openness to broad markets is essential. However, German denial to export Eurofighter jets to Saudi Arabia is a hazard to such expectations (Chelton & Shetler-Jones, 2023; Defence Insight Team, 2023). Dassault has flagged this

issue as highly relevant, which is critical since it is the French company in combined charge of the FCAS (Perry, 2023).

According to Dassault, the sale of a combat aircraft is “part of the business model” (Perry, 2023, paragraph five). A common European platform will have many competitors in the defence market. Although the Russian war in Ukraine may affect the prospects of potential clients buying Russian aircraft (Global Data,

2023), the US is a strong rival for the Western market. Beyond those usual suppliers of aircrafts in Europe, many countries are self-providing combat aircraft, while even Turkey has its own project (Burak Ege Bekdil, 2023). Exports are critical to finance the GCAP project (Chelton & Shetler-Jones, 2023). Finally, another rival for combat aircraft markets will be China (Barrie et al., 2022).

FUTURE COMBAT AIRCRAFT

The reality from the past century is gone. If Europe wants to avoid degradation in the international order, it should function as a great power in terms of exercising its hard power. However, increasing autonomy or seeking independence in the defence realm from the United States necessitates major efforts. If the goal is to be a key international player, autonomy in this sector is pivotal.

Defence budgets have been under considerable scrutiny for better spending. However, the present situation demands to invest in projects that can fulfil multiple goals, such as multirole aircrafts that can be used for a variety of tasks by different countries (Barrie, et al., 2022). Thus, the FCAS project has a window of opportunity to become essential for long-term cooperation and interoperability between the EU and its allies.

The Russian-Ukraine war has confirmed the essential role of air superiority in achieving strategic objectives. However, Ukraine currently relies on outdated Soviet airplanes (Ministry of Defence of Ukraine, 2020).

Therefore, it has requested the provision of F-16 planes from its Western allies (Stern & Morgunov, 2023). The Ukrainian Minister of Defence, while planning for 2035, anticipates the need for modernizing their air assets, as existing Ukrainian inventory is projected to have a service life no longer than 2030 (Ministry of Defence of Ukraine, 2020). The current level of Western aid projects a successful future employment of Western technologies (Bertamini, 2023).

Swedish Gripen jets could meet Ukraine’s mid-term needs due to their simpler operability (Bronk et al., 2022). However, in the long term, deterring Russia will demand air superiority, of which the United States and Europe will be the main competitors to facilitate (Bronk et al., 2022). In one way or another, the European broad defence architecture will incorporate Ukraine which implies that Ukraine will need to seek interoperability with their closest partners (Ries & Shatz, 2023).

The United States has announced that it will

shift its focus to the Indo-Pacific realm over the coming years (U.S. Department of Defense, 2022). This decision has the secondary effect of increasing the reliance on Europe's capabilities to deter and defend its territory (U.S. Department of Defense, 2022). From a strategic perspective, Europe needs to strengthen its ability to provide advanced weapons systems for itself. Even though today, there are many industries in numerous countries capable of providing resources to these forward posture efforts, assuming increased responsibilities demands collaborative efforts to fulfil such strategic goals (Gilli & Gilli, 2017).

Autonomous weapons systems (AWS) used in warfare are a reality that is growing with agile momentum. The new generation of combat aircraft development embodies the use of advanced technology for merging considerable amounts of information in real time. This type of technology is already well-established in the United States, China, and Russia (Barrie et al., 2022; Global Data, 2023).

Strategic instability and the use of autonomous weapons systems could be critical for the new scenario of geopolitics because they are prone to proliferation (Altmann & Sauer, 2017). This can be seen in the engagement of different countries possessing such weaponry, most notably in the air realm (Altmann & Sauer, 2017, p. 122). Thus, such a prospect suggests that due to costs and technology availability, these arms will spread. Therefore, Europe needs to be in the vanguard of its operational and combat capabilities.

In another realm, the commitment of Europe to international humanitarian law will be tested in the AWS realm. Thus, community

involvement must go beyond just operational efficiencies because there are multiple ethical concerns regarding the use of autonomous systems in warfare. This will be addressed later in the paper.

Although the United States has the F-22 as the more advanced aircraft, a project is in motion to develop an even more enhanced plane (Global Data, 2023). Preparing for the future requires present investment to avoid dependence on the North American allies in terms of advanced aircraft technology. Therefore, current situations like further European countries acquiring F-35s need to recede (Baronio, 2023)

According to Thierry Burkhard, former Chief of the Defence Staff of France between 2019 and 2023, "Whenever possible, we must choose the EU" (European Defence Agency, 2022, p. 24). Such a perspective representing a major defence actor of the community, as it is France, may be a message for NATO, EU or other European countries to engage in deeper commitment with the community in the defence realm.

The incorporation of more countries into NATO or the EU is in no clear scenario. In that regard, assuming broader defence commitments may be a difficult path if it is planned to enlarge that Alliance. Instead, lighter arrangements may be the way in the short term. As such, the endeavour to achieve significant interoperability is crucial for creating a broad deterrence architecture needed to achieve European strategic autonomy.

The international liberal order could embrace multiple changes soon due to shifts in the foundations of security architecture. According to many forecasts, the US would seek a

deeper engagement in Asia to counter China, as Europe is looking for more profound autonomy or independence in its security architecture (U.S. Department of Defense, 2022; European Defence Agency, 2022)

The FCAS is the most ambitious project ever proposed in the European defence realm (Mahieu, 2019). Although the GCAP may be less ambitious in terms of funding and missions or configurations that the aircraft may assume such as interceptor or nuclear delivery, both ventures share the goal of being an advanced platform that can compete with American alternatives (Roukoz, 2023).

The outset of the Russian-Ukraine war has particularly restated such a necessity for Europe due to the involution experienced by combat air capabilities in the previous years. Thus, the previous situation in terms of defence readiness and the current necessity to develop credible air capabilities can be portrayed as follows.

“After two decades in which US and European combat air operations were predominantly involved in supporting ground-centric counterinsurgency and counter-terrorism operations in generally permissive air environments, deteriorating international security is resulting in a renewed focus on peer or near-peer war in a contested air domain” (Barrie et al., 2022, p. 3).”

Thus, there is a real issue in Europe for agile work to rebuild combat air capabilities not only for deterrence but also to engage in current combat air missions, such as patrolling the eastern flank of Europe (Bronk, 2023).

The amount of investment needed to develop a sixth-generation aircraft is colossal, as the cost-benefit equation for matching technol-

ogy according to Kirkpatrick’s model (1997) suggests that the costs will continue to grow and the margins will decrease (Hemler, 2023; Gilli & Gilli, 2017). To understand this, it is vital to delve in the hurdles to acquire funding in the context of a heterogenous European industrial defence complex. (Baronio, 2023).

The design of a future combat aircraft project should integrate information collected by different platforms in different realms, such as air, sea, land, space and cyberspace, which has been called as a System of Systems (Roukoz, 2023). In that regard, interoperability of different systems is one of the main updates of this variant compared to current technologies. Globally, the sixth-generation projects share milestones like “stealth technology, digital integration, and MUM-T capabilities” (Global Data, 2023).

In the FCAS project, the integration is based on seven pillars allocated in the industries of the different partners (Roukoz, 2023). Of these pillars, the main ones are the possibility to integrate aircrafts with remote carries (even expendable ones) and connectedness to the combat cloud (Roukoz, 2023). The United States already embarked on such a development (Roukoz, 2023). On the FCAS project, recent announcements suggest progress on the development of the expendable remote carrier, high skilled for neutralise air-defences and highly autonomous (Petersen, 2023)

Regarding the GCAP, the project has established its objectives “to harness next-generation technologies to deliver cutting-edge sensors, weapons and data systems” and “uncrewed aerial systems” (UK Ministry of Defence, 2022, p. 82). A quick comparison may suggest that the combat cloud of the FCAS

is a more ambitious aim (Roukoz, 2023), as the GCAP is expected to only operate under “digital networks linking forces across air, land and sea (UK Ministry of Defence, 2022, p. 82). Some sources even state that Belgium chose to join the FCAS project due to the higher technological edge of the project compared to the GCAP (The Brussels Times, 2023) Spilling over to the civilian sector due to in-

novation could bolster the projects in a major way (Roukoz, 2023; Gilli & Gilli, 2017). The amount of funding needed by the projects suggests that, at some point, the market will need to engage deeply to reach the proper level of investment (Barbieux, 2023). Although this is a critical situation for Europe’s defence realm, the market will still act under the cost-benefit criteria (Kirkpatrick, 1997).

CHALLENGES

Bogged Projects

Europe has long seen the existence of different projects as something undesirable due to the opportunities lost by the lack of collaboration (Barrie et al., 2022). The potential European countries involved in the development of the aircraft have different needs, which may hinder the possibility of developing a joint venture (Baronio, 2023). However, optimistically evaluating the situation, the diversity of operational features may enhance the chances of developing a multi-role aircraft. Although “Multirole platforms are more expensive, but also more flexible and thus easier to deploy in different operational environments” (Gilli & Gilli, 2017, p. 2)

Expanding on the momentum of these projects, some authors stated that, due to conflicts in the FCAS, the GCAP is in a better shape (Magnuson, 2023). Nevertheless, several political meetings between the defence leaders of France, Germany, and Spain throughout the year 2023 boosted the design phase (Magnu-

son, 2023; Pons, 2023). On top of that, the addition of Belgium to the project enhances the financial challenges ahead. Not only because Belgium may be a potential purchaser of the aircraft (Hemler, 2023) but also because there is a big political commitment in Brussels to the project in terms of funding allocated for the endeavor (The Brussels Times, 2023).

Funding is a significant issue for both projects and is one of the reasons for the engagement of multiple countries. While France and Germany have already announced defence budget increases for the following years, the United Kingdom is expected to stay near the 2% level of GDP on military spending, as required by NATO (Chalmers, 2023). Thus, the GCAP project may face more future funding hurdles, despite having announced current investments of one billion pounds in 2022 (UK Ministry of Defence, 2022).

In the UK-led project, the public funding announced by the European involved countries “falls wells short” (Bronk, 2023, paragraph

Convergences and Divergences:
Unravelling the Challenges and Opportunities of the Future Combat Aircraft of Europe, a key element for European Interoperability

one). Different perspectives exist regarding the commitment of Japan and Italy to the project because even though Japan may allocate equal funds to the UK, showing at least a similar engagement to the project, on the other side, Italy has recently purchased the F-35, which adds obstacles to the availability of funds (Bronk, 2023)

Although the finance numbers of the Eurofighter were skyrocketing (Bronk, 2023; Kirkpatrick, 1997), the current investment for GCAP and FCAS is far from matching those figures (Bronk, 2023). The export experience of the Eurofighter until this day with the Tranche 3 variant should be considered as a model to endure financial stability (Defence Insight Team, 2023)

Another issue is the political realm. Europe has a complex political power allocation due to its many agencies and countries involved in the decision-making process. Furthermore, the significant number of industries involved in the analysed projects hinders the agility of decisions compared to the United States and China (Baronio, 2023; Barry et al., 2023). To overcome those issues, the political commitment to defence projects is essential, as politicians hold the keys to defunding projects (Noll, 2023). In that regard, recent announcements from the United Kingdom, in terms of pragmatic defence relations with Europe, may be positive for the progress of future projects and their interoperability (Chalmers, 2023)

Although Brexit has strained the United Kingdom's eligibility for certain EU defence investment funding, it does not imply the complete isolation of its defence industry. Some authors have characterised the involvement in the PESCO military mobility pro-

gram as a pragmatic move from the UK to assume narrow defence commitments with Europe (Chalmers, 2023). This pragmatism may bolster the perspective of success for the GCAP.

Fragmented industry

There is no joint national military-industrial complex in Europe due to its political fragmentation (Barrie et al., 2022). The current scenario shows that the most prominent market actors are nationally based companies seeking to fulfil the national objectives based on political and economic motivations (Barrie et al., 2022). The isolation of the companies hinders the potential of achieving economies of scale and synergies. There are six countries in Europe with important aerospace companies, which have been the main actors in developing combat aircraft in the past, and currently, they are separated into two groups developing rival projects (Barrie et al., 2022) Nonetheless, the lack of cooperation has led to the rise of different companies delivering identical systems (Gilli & Gilli, 2017). This problem is a major issue for Europe, having at least 3 European suppliers of combat aircraft (Barbieux, 2023). The comparison with other prominent actors like the United States, Russia and China reveals less diversity of the leading weaponry suppliers (Barbieux, 2023) Even though the European industrial complex should remain centred on national interests, the industrial base “must increase maturity and make viable key disruptive technologies” (Pons, 2023, paragraph three) or assume the reality that in the defence realm, it will be in a lower tier. Industrial fragmentation is a major

hindrance in the development of the FCAS, resulting in delays in the project's timeline (Jennings, 2022; Magnuson, 2023). Thus, a collaborative perspective promoted by European agencies to share costs and work towards strategic autonomy is essential to address those challenges (Le Gleut & Conway-Mouret, 2020; European External Action Service, 2022).

Past and Present Divergences

The past European collaborative projects have shown the complexity of cooperation in the defence realm. In the Eurofighter project, some problems have reached such a level of discussion that they have had to be solved by politicians, in issues like work allocation and other commercial-industrial issues, something that should have been kept on the partners level (Chelton & Shetler-Jones, 2023). In terms of disputes between the partners, Germany and France had agreed on several defence collaborative projects, specifically a new aircraft and a new main battle tank, the most relevant ones for interoperability. Although the deal states that France will be the leader of the project (Noll, 2023; Barrie et al., 2022), it is worth to remember that during the development of the Eurofighter, France abandoned the project to opt for the Dassault Rafale (Magnuson, 2023).

Autonomous Weapon Systems (AWS)

The evolution of warfare throughout recent years has added a myriad of autonomous weapons with various levels of autonomy (Arkhipov-Goyal & Chavannes, 2021). Such

technologies allow for faster and more precise responses to certain threats. However, many ethical discussions exist regarding human control over the technology, the accountability of the actions and the norms that should assess the limits of such technologies. (Altmann & Sauer, 2017) (Arkhipov-Goyal & Chavannes, 2021).

Both the FCAS and GCAP projects will integrate an ensemble of vehicles with autonomous technology (Hemler, 2023) (Barrie, et al., 2022). These vehicles may be used for tasks of surveillance, reconnaissance, intelligence, target acquisition, and suppression of air defences, which implies multiple regulations of the autonomy, because the rules of engagement from target acquisition are far different than those involving the use of arms (Arkhipov-Goyal & Chavannes, 2021) (Barrie, et al., 2022).

In this regard, the endeavour of the European Combat Aircraft should address the discussion of humanitarian limits. The relationship between the autonomous technology and the human involvement in the decision chain is highly complex and its outcomes are yet to be determined. (Arkhipov-Goyal & Chavannes, 2021). Thus, it is key for a human-centric development of warfare that Europe assume leadership in this realm because both states and non-state groups may employ this type of technology, which have different commitments to the laws of war.

The US and Israel are conducting research to produce autonomous systems that comply with international humanitarian law, and Europe should leverage these projects to such endeavour. Hence, less scrupulous actors not bound by international human rights and

manitarian law will find AWS development much easier (Altmann & Sauer, 2017, p. 126) (Arkhipov-Goyal & Chavannes, 2021)

As for the FCAS, Airbus, one of the leading companies involved in the development, has engaged in studies about the responsible use of artificial intelligence in the project (Azzano et al., 2022). This may be evidence of the commitment of Europe with responsible use of the technology. However, it is yet to be determined if those commitments can be aligned with the cost-benefit scheme of the remote carriers.



OPPORTUNITIES

Interoperability

Avoiding national priorities and interests in favour of European objectives has a lot to do with the interoperability of the armed forces (Barbieux, 2023). Having weaponry systems that can operate together depends not only on industrial synergy but also on political commitment to prioritise the capability for joint acts (European Defence Agency, 2022). Due to the size of the project, this could break the paradigm of isolation in European defence innovation.

The future combat aircraft can enhance interoperability through the integration of technologies, integration of different countries and industries in the project, while allowing for economies of scale in maintenance due to having standardised aircraft fleets (Gilli & Gilli, 2017). Moreover, some European companies involved in the two major projects have already worked togeth

er in distinct stages of the Eurofighter (Barrie, et al., 2022).

Some experts have even argued that there is room for merging the two projects (Bronk, 2023). They base their claims on the requirements of significant investments, the high technology needed to develop an advanced aircraft and the current specialisation of the countries involved (Bronk, 2023).

Delving further into the issue of developing costs of such an advanced aircraft, the analysis should integrate a prospective analysis of the future updates that the technology demands to be a credible competitor for achieving air superiority (Kirkpatrick, 1997). In this regard, the United States have an outstanding advantage due to the technological progress acquired during the development of the F-22 and F-35 jets (Gilli & Gilli, 2017; Bronk, 2023)

Regarding a common European aircraft,

there is a need to further discuss the efforts to reconstruct the Ukrainian army. The Western arms supply for Ukraine and the continuation of the Russian threats suggest that such technology will be the future of Ukraine Armed Forces (Ries & Shatz, 2023; Bertamini, 2023). Regarding aircrafts, this scenario is already in motion with the public Ukrainian request for F-16s by the Ukrainian President (Bronk, Reynolds, & Watling, 2022)

The nuclear commitment of UK and France to NATO is another issue that may help to bring the two projects closer. The potential for a less forward posture of the United States would result in Europe needing to increase its deterrence capabilities through a more decisive forward posture (Martini et al., 2023). France currently relies on the Rafale for the nuclear strike role (Barrie et al., 2022) and the UK does not have a designated aircraft for such a mission (The Government of the UK, 2023). Thus, if the future safety of Europe demands more credible deterrence capabilities, the UK may be prompted to have an aircraft available to deliver a nuclear strike.

PESCO

In terms of management of defence projects, the Permanent Structured Cooperation (hereafter as “PESCO”) could be an important aid. Past divergences within the cooperation between different industries related to national sovereignty, project leadership, jobs allocation and intellectual property could be solved through the tutelar role of PESCO (Blockmans & Crosson, 2021)

PESCO is a significant initiative within the European Union (EU) that aims to enhance defence and security cooperation among its member states (Blockmans & Crosson, 2021). Established in 2017, PESCO signifies a commitment to furthering European defence autonomy and strengthening the EU’s capacity to respond to security challenges. (Blockmans & Crosson, 2021).

The PESCO projects encompass areas such as joint military capabilities, research and development, and crisis management (Blockmans & Crosson, 2021). Moreover, PESCO provides a framework for pooling resources, sharing knowledge and developing a joint approach to security and defence. Thus, it may ultimately lead to a reduced dependency on external defence actors, notably the United States, by promoting greater coordination and interoperability among the armed forces of EU member states (Blockmans & Crosson, 2021).

EDF

Delving into tools for tackling funding issues, the European Defence Fund (hereafter “EDF”) is a significant initiative launched by the European Union (EU) to strengthen defence capabilities, promote research on defence and development and enhance security cooperation among its member states (European Commission, 2021). Established in 2017, the EDF represents a pivotal step towards achieving a more unified and autonomous European defence framework.

The EDF primarily focuses on two main pillars: research and capability development (European Commission, 2021). It provides fund-

ing for collaborative research projects aimed at fostering innovation and technological advancements in the defence sector (European Commission, 2021). This research is critical in addressing emerging security challenges, improving defence systems, and encouraging competitiveness within the European defence industry (Barbieux, 2023).

One of the issues of this initiative is the allocation of funds for countries of the EU (European Commission, 2021). If the GCAP merges with the FCAS, the participation of third countries within the project further complicates the already problematic relation of the UK with Europe (Chalmers, 2023). Moreover, Japan may produce issues for EDF funding due to the potential involvement or participation of Saudi Arabia in the project (Chelton & Shetler-Jones, 2023).

The capability development pillar of the EDF supports the joint development of defence capabilities by EU member states (European Commission, 2021). It aims to reduce duplication of efforts and resources, enhance interoperability and promote the pooling of resources in the defence sector (European Commission, 2021). It aims to develop more efficient and cost-effective defence capabilities for Europe, which are essential for modern warfare and achieving strategic autonomy (Gilli & Gilli, 2017).

Finally, the connection between EDF and PESCO allows European countries to receive more funding for their defence projects (European Commission, 2021), helping to enhance the coordination in the European defence-industrial complex. It also bolsters interoperability, which is necessary to achieve strategic autonomy and reduce reliance on ex-

ternal defence providers (European Defence Agency, 2022).

EDIRPA

In a recent measure to promote defence collaboration and cooperation, the European Council has passed a bill named European Defence Industry Reinforcement through the Common Procurement Act (hereafter “EDIRPA”). This act incorporates up to €300 million euros in funding until 2025 for enhancing defence capabilities (European Parliament, 2023)

One of the act’s objectives is to finance research and development but with requirements prone to favoured European Union industries and EU interests (European Parliament, 2023). Considering that both FCAS and GCAP projects are in the initial stages of development, the implementation of EDIRPA can be seen as an opportunity to leverage this budget for allocating additional funds for the future European aircraft within a cooperative framework aimed at advancing European interests.

Although the initial funding is small, the momentum established by this act and the struggles experienced by the FCAS and GCAP projects may prompt Europe to catalyse a necessary collaborative environment (Barbieux, 2023). The objective of EDIRPA, promoting effectiveness for European aims, is clear as “The instrument is meant to foster cooperation in procurement, increasing solidarity, interoperability, and efficiency of defence spending” (Barbieux, 2023, p. 3).

CONCLUSION

The Russian war in Ukraine serves as a stark reminder of the critical importance of air superiority in modern warfare, with devastating consequences of its absence. The Western world and Russia have long been at the forefront of air combat technology, while China is developing strong capabilities. Although developing advanced aircraft requires significant investment, it has come to indicate geopolitical strength.

Europe's commitment to developing its own fighter jet is evident, with a substantial portion of defence budgets allocated for this purpose. However, it faces many challenges in achieving this goal, given the complex mix of aircraft types employed by European countries, including American, European, and Russian models. The development of a Future Combat Aircraft is thus vital for European defence. However, it will undoubtedly encounter numerous hurdles.

The challenges from the past are still present in a fragmented defence industry, with rival countries seeking certain levels of dominance embodied in the intertwined relation of gov-

ernment and defence industry. Although it has been a problem in the past, the politics are essential to achieve the academic consensus over a more resilient and self-reliant defence in Europe. In terms of the size of the projects, the collaboration and coordination efforts from the European leadership are opportunities to institutionalise the defence interoperability.

Even though initiatives like PESCO, EDF, and EDIRPA are too recent for a fair assessment of their results and challenges, the commitment of European agencies to coordinating policies with the industrial community is evident. As established in the paper, bolstering certain strategic projects in the defence realm could prevent divergences between the cost-benefit reasoning of private industrial companies and national interests. Finally, to better understand this phenomenon, future research could focus on how the European Union's funding and management policies can bolster and protect projects that are crucial to achieving strategic autonomy.

REFERENCES

- Altmann, J., & Sauer, F. (2017). Autonomous Weapon Systems and Strategic. Survival, 117-142. Retrieved from <http://dx.doi.org/10.1080/00396338.2017.1375263>
- Arkhipov-Goyal, A., & Chavannes, E. (2021). The Ethics of Robotic and Autonomous Systems in a Military Context. The Hague: Hague Centre for Strategic Studies. Retrieved from <https://www.jstor.org/stable/resrep29554.5>
- Azzano, M., Boria, S., Brunessaux, S., Carron, B., De Cacqueray, A., Gloeden, S., . . . Mohrdieck, S. (2022). The Responsible Use of Artificial Intelligence in FCAS – An Initial Assessment. Retrieved from Airbus: <https://www.fcas-forum.eu/en/articles/responsible-use-of-artificial-intelligence-in-fcas>
- BAE Systems. (n.d.). Global Combat Air Programme. Retrieved from BAE Systems: <https://www.baesystems.com/en/product/global-combat-air-programme#:~:text=new%20joint%20development,-These%20include%20IHI%20Corporation%2C%20Mitsubishi%20Electric%20and%20Mitsubishi%20Heavy%20Industries.commitment%20to%20future%20combat%20air.>
- Barbieux, F. (2023, September 1). Tackling the Issue of Fragmentation in the European Defence Industry. Retrieved from Finabel: <https://finabel.org/tackling-the-issue-of-fragmentation-in-the-european-defence-industry/>
- Baronio, F. (2023, August 28). 6th Generation Fighter Jets Development Implications for European Air Forces Interoperability. Retrieved from Finabel: <https://finabel.org/6th-generation-fighter-jets-development-implications-for-european-air-forces-interoperability/>
- Barrie, D., Giegerich, B., Hoffmann, F., Lapo, A., Le Breton, C., & Schreer, B. (2022, March 1). European Combat Air Power:. Retrieved from The International Institute: <https://www.iiss.org/research-paper//2022/03/european-combat-air-power-a-snapshot>
- Barry, B., Boyd, H., Giegerich, B., Gjerstad, M., Hackett, J., Michel, Y., . . . Tong, M. (2023). The Future of NATO's European Land Forces: Plans, Challenges, Prospects. The International Institute for Strategic Studies. Retrieved from <https://www.iiss.org/research-paper/2023/06/the-future-of-natos-european-land-forces/>
- Bergmann, M., Morcos, P., Wall, C., & Monaghan, S. (2022). Transforming European Defense. Washington: Center for Strategic and International Studies. Retrieved from <https://www.csis.org/analysis/transforming-european-defense>
- Bertamini, G. (2023, June 28). The Role of Western Training and Equipment in Ukraine's Counter-Offensive Strategy. Retrieved from [www.finabel.org: https://www.finabel.org/the-role-of-western-training-and-equipment-in-ukraines-counter-offensive-strategy/](https://www.finabel.org/the-role-of-western-training-and-equipment-in-ukraines-counter-offensive-strategy/)
- Blockmans, S., & Crosson, D. M. (2021). PESCO: A Force for Positive Integration in EU Defence. European Foreign Affairs Review, 26(Special Issue), 87-110. doi:<https://doi.org/10.1017/S1575787521000087>

Bronk. (2023, April 27). Global Combat Air Programme is Writing Cheques that Defence Can't Cash. Retrieved from RUSI: <https://rusi.org/explore-our-research/publications/commentary/global-combat-air-programme-writing-cheques-defence-cant-cash>

Bronk, J., Reynolds, N., & Watling, J. (2022, November 7). The Russian Air War and Ukrainian Requirements for Air Defence. Retrieved from Royal United Services Institute: <https://rusi.org/explore-our-research/publications/special-resources/russian-air-war-and-ukrainian-requirements-air-defence>

Chalmers, M. (2023, February 24). The UK as a European Power. Retrieved from RUSI: <https://rusi.org/explore-our-research/publications/commentary/uk-european-power>

Chelton, S., & Shetler-Jones, P. (2023, September 13). The Global Combat Air Programme: The First Round of Hard Choices? Retrieved from RUSI: <https://rusi.org/explore-our-research/publications/commentary/global-combat-air-programme-first-round-hard-choices>

Defence Insight Team. (2023, September 11). Insight: What does the future hold for the Eurofighter Typhoon combat aircraft? Retrieved from SHEPARD: <https://www.shephardmedia.com/news/air-warfare/insight-what-does-the-future-hold-for-the-eurofighter-typhoon-combat-aircraft/>

European Commission. (2021, June 30). THE EUROPEAN DEFENCE FUND. Retrieved from European Commission: <https://defence-industry-space.ec.europa.eu/system/files/2022-05/Factsheet%20-%20European%20Defence%20Fund.pdf>

European Commission. (2022, May 23). European Commission. Retrieved from European Defence Fund Indicative multiannual perspective 2021-2027: <https://defence-industry-space.ec.europa.eu/system/files/2022-05/EDF%20Indicative%20multiannual%20perspective.pdf>

European Defence Agency. (2022, June). EU's Strategic Compass: Following the Ambition. European Defence Matters, pp. 22-25. Retrieved from https://www.eeas.europa.eu/sites/default/files/documents/strategic_compass_en3_web.pdf

European External Action Service. (2022). Foreword by HR/VP Josep Borrell: A STRATEGIC COMPASS TO MAKE EUROPE A SECURITY PROVIDER. Retrieved from European External Action Service: https://www.eeas.europa.eu/eeas/strategic-compass-security-and-defence-1_en#:~:text=A%20Strategic%20Compass%20for%20the%20EU&text=The%20strength%20of%20our%20Union,to%20international%20peace%20and%20security.

European Parliament. (2023, September 12). MEPs vote to strengthen EU defence industry through common procurement. Retrieved from European Parliament: <https://www.europarl.europa.eu/news/en/press-room/20230911IPR04908/meps-vote-to-strengthen-eu-defence-industry-through-common-procurement>

Germany Federal Government. (2023). Robust. Resilient. Sustainable. Integrated Security for Germany. National Security Strategy. Berlin: Federal Foreign Office. Retrieved from <https://www.nationalesicherheitsstrategie.de/National-Security-Strategy-EN.pdf>

- Gilli, A., & Gilli, M. (2017, April). European defence cooperation in the. Brief Issue, pp. 1-4. Retrieved from <https://www.jstor.org/stable/resrep06831>
- Global Data. (2023, August 14). The global development of sixth-generation fighters. Retrieved from Air Force Technology: <https://www.airforce-technology.com/comment/sixth-generation-aircraft-developments/?cf-view&cf-closed>
- Hemler, J. (2023, June 28). BRIEFER: Future Combat Air System (FCAS). Retrieved from Security Monitor: <https://dsm.forecastinternational.com/wordpress/2023/06/28/briefer-future-combat-air-system-fcas/>
- Jennings, G. (2022, June 8). Dassault predicts decade of delay for FCAS fighter. Retrieved from Janes: <https://www.janes.com/defence-news/news-detail/dassault-predicts-decade-of-delay-for-fcas-fighter#:~:text=Dassault%2C%20one%20of%20the%20three,by%20at%20least%20a%20decade.>
- Kirkpatrick, D. (1997, June). Affordability of Defence Equipment. The RUSI Journal, 142(3), 58-63. Retrieved from <https://www.proquest.com/trade-journals/affordability-defence-equipment/docview/212115843/se-2>
- Le Gleut, R., & Conway-Mouret, H. (2020, July 15). 2040, l'odyssée du SCAF - Le système de combat aérien du futur - version anglaise. Retrieved from Sénat: <https://www.senat.fr/rap/r19-642-2/r19-642-22.html>
- Magnuson, S. (2023, June 20). PARIS AIR SHOW NEWS: Europe's Next-Gen Jet Fighter Makes Little Progress in Four Years. Retrieved from National Defense: <https://www.national-defense-magazine.org/articles/2023/6/20/europes-next-gen-jet-fighter-makes-little-progress-in-four-years>
- Mahieu, V. (2019, June 25). FCAS Programme – Shaping the Future of Air Power? Retrieved from Finabel: <https://finabel.org/fcas-programme-shaping-the-future-of-air-power/>
- Martini, J., Radin, A., Demus, A., Marcinek, K., Massicot, D., Pfrommer, K., . . . Zeigler, S. M. (2023). Detering Russia and Iran. Improving Effectiveness and Finding Efficiencies. Santa Monica, California: RAND Corporation.
- Ministry of Defence of Ukraine. (2020). Air Force Vision 2035. Kiev: Ministry of Defence of Ukraine. Retrieved from https://shron1.chtyvo.org.ua/Ministerstvo_oborony_Ukrainy/Air_Force_Vision_2035_anhl.pdf?PHPSESSID=ccugid7g1vmh6m0dhls74m6c0
- Noll, A. (2023, September 2022). Germany and France: Still keen on joint defense projects? Retrieved from DW: <https://www.dw.com/en/germany-and-france-still-keen-on-joint-defense-projects/a-66899923>
- North Atlantic Treaty Organization. (2022). STRATEGIC CONCEPT. MADRID: NATO. Retrieved from https://www.nato.int/cps/en/natohq/topics_210907.htm
- Osborne, T. (2023, June 19). Sweden Preparing For Future Combat Aircraft Studies. Retrieved from Aviation Week: <https://aviationweek.com/shownews/paris-air-show/sweden-preparing-future-combat-aircraft-studies>

Perry, D. (2023, July 20). Dassault chief concerned by impact of Germany on FCAS export sales. Retrieved from Flight Global: <https://www.flightglobal.com/defence/dassault-chief-concerned-by-impact-of-germany-on-fcas-export-sales/154212.article>

Petersen, N. T. (2023, June 22). Paris Air Show 2023: MBDA announces new FCAS effector programme. Retrieved from Janes: <https://www.janes.com/defence-news/news-detail/paris-air-show-2023-mbda-announces-new-fcas-effector-programme#:~:text=MBDA%20is%20developing%20a%20new,the%20Paris%20Air%20Show%202023.>

Pons, J. (2023, April 29). European FCAS wants to take off from a carrier armed with a nuclear missile. Retrieved from Atalayar: <https://www.atalayar.com/en/articulo/new-technologies-innovation/european-fcas-wants-take-carrier-armed-nuclear-missile/20230429121410184124.html>

Ries, C. P., & Shatz, H. J. (2023, September 18). Looking Beyond the War: Planning for Ukraine's Reconstruction. Retrieved from www.rand.org: https://www.rand.org/blog/2023/09/looking-beyond-the-war-planning-for-ukraines-reconstruction.html?utm_source=AdaptiveMailer&utm_medium=email&utm_campaign=7014N000001SnimQAC&utm_term=00v4N-00000m1irAQAQ&org=1674&lvl=100&cite=280455&lea=2101850&ctr=0&par=1&t

Roukoz, J. (2023, July 12). FCAS, a major European defense program marking the transition to the era of collaborative combat. Retrieved from European Defence Review Online: <https://www.edrmagazine.eu/fcas-a-major-european-defense-program-marking-the-transition-to-the-era-of-collaborative-combat#:~:text=FCAS%20is%20intended%20to%20replace,assets%20engaged%20in%20the%20field.>

Stern, D., & Morgunov, S. (2023, April 28). Donated MiG jets will not give Ukraine air superiority against Russia, experts say. Retrieved from Washington Post: <https://www.washingtonpost.com/world/2023/04/27/mig-fighter-jets-ukraine-russia/>

The Brussels Times . (2023, June 22). FCAS is a unique opportunity to build European Defence, says Belgium's Defence Minister. Retrieved from The Brussels Times : <https://www.brusselstimes.com/565475/fcas-was-a-unique-opportunity-to-build-european-defence-says-belgiums-defence-minister>

The Government of the UK. (2023, March 16). The UK's nuclear deterrent: what you need to know. Retrieved from Government UK: <https://www.gov.uk/government/publications/uk-nuclear-deterrence-factsheet/uk-nuclear-deterrence-what-you-need-to-know#the-people-who-make-it-possible>

Tran, P. (2023, March 29). Evolving European Fighter Programs: A March 2023 Update. Retrieved from Second Line of Defense: <https://sldinfo.com/2023/03/evolving-european-fighter-programs-a-march-2023-update/>

U.S. Department of Defense. (2022). National Defense Strategy. Washington: Secretary of Defense. Retrieved from <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF>

UK Ministry of Defence. (2022). Defence's response to a more contested and volatile world. London: Ministry of Defence. Retrieved from <https://www.gov.uk/official-document>

Convergences and Divergences:
Unravelling the Challenges and Opportunities of the Future Combat Aircraft of Europe, a key element for European Interoperability

Created in 1953, the Finabel committee is the oldest military organisation for cooperation between European Armies: it was conceived as a forum for reflections, exchange studies, and proposals on common interest topics for the future of its members. Finabel, the only organisation at this level, strives at:

- Promoting interoperability and cooperation of armies, while seeking to bring together concepts, doctrines and procedures;
- Contributing to a common European understanding of land defence issues. Finabel focuses on doctrines, trainings, and the joint environment.

Finabel aims to be a multinational-, independent-, and apolitical actor for the European Armies of the EU Member States. The Finabel informal forum is based on consensus and equality of member states. Finabel favours fruitful contact among member states' officers and Chiefs of Staff in a spirit of open and mutual understanding via annual meetings.

Finabel contributes to reinforce interoperability among its member states in the framework of the North Atlantic Treaty Organisation (NATO), the EU, and *ad hoc* coalition; Finabel neither competes nor duplicates NATO or EU military structures but contributes to these organisations in its unique way. Initially focused on cooperation in armament's programmes, Finabel quickly shifted to the harmonisation of land doctrines. Consequently, before hoping to reach a shared capability approach and common equipment, a shared vision of force-engagement on the terrain should be obtained.

In the current setting, Finabel allows its member states to form Expert Task Groups for situations that require short-term solutions. In addition, Finabel is also a think tank that elaborates on current events concerning the operations of the land forces and provides comments by creating "Food for Thought papers" to address the topics. Finabel studies and Food for Thoughts are recommendations freely applied by its member, whose aim is to facilitate interoperability and improve the daily tasks of preparation, training, exercises, and engagement.



Tel: +32 (0)2 441 79 05 – GSM: +32 (0)483 712 193
E-mail: info@finabel.org

You will find our studies at www.finabel.org



European Army Interoperability Centre



www.linkedin.com/in/finabelEAIC



[@FinabelEAIC](https://www.facebook.com/FinabelEAIC)



[@FinabelEAIC](https://twitter.com/FinabelEAIC)