

BRIDGING HORIZONS: INTEGRATING SPACE AND DEFENCE FOR A STRONGER EUROPE

There will be no serious defence capabilities in Europe without efficient space-based capabilities under the control of European entities

There cannot be European space-based capabilities without a European space industry capable to design, develop, produce, deploy and exploit the required infrastructures

There will be no such a space industrial base without a dedicated space industrial policy at European level

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Executive summary: Key recommendations for European public authorities

The “European Defence Fund” – to develop new capabilities –, the “European Defence Industry Reinforcement through common Procurement” Act – to incentivise cooperation in defence procurement between Member States to jointly coordinate and acquire the most urgent and critical defence product – and the future “European Defence Industry Programme” – to strengthen the EU's Defence Technological and Industrial Base (EDTIB) and improve its responsiveness through increased collaborative investment – are welcome instruments that have the potential to enable the European space sector to catch up with a huge gap in space capabilities for defence.

The fragmentation of the European defence market has so far allowed only a small handful of European States to develop relatively modest capabilities in comparison with the other space powers; the pooling of resources made possible by the new European instruments will finally allow the further development of shared information and communications capabilities that are vital for the defence of the continent. However, Europe is not starting from scratch: unlike all the other space powers, where civil space has developed essentially as a “by-product” of defence policy, Europe has, for its part, developed an arsenal of civilian space capabilities that could now be upgraded, re-tooled or simply better exploited to serve military needs (thus achieving a significant gain in efficiency).

Of course, one could easily highlight the specificities of the space sector but all domains and capabilities have probably their own. But **what makes space particularly interesting in the context of EU defence instruments, is that it is also a competence of the EU, which itself owns already several civilian space infrastructures, finances Research & Development programmes and on which it can have a leverage effect thanks to its procurements and specific regulations.** Therefore, besides its role as an indispensable enabler of a multitude of defence capabilities, this is also a certainly a good enough reason to explicitly highlight space as a vital domain in the frame of the EU defence industry programmes. To achieve the urgent and crucial objective of reinforcing European defence capabilities through space, and in space, the European space industry is sharing, in this document, its assessment on a number of important challenges to overcome, as well as recommendations. Hereunder, a summary of the main ones:

- **Reinforce European sovereign access to space as a strategic prerequisite:** Autonomous access to space is an imperative in an era characterised by growing strategic, economic and military competition. The EU needs to strengthen its ability to autonomously launch all institutional satellites supporting security and defence functions, from European flagship programmes to the critical governmental missions of Member States. Non-dependence on foreign launchers is a requirement for the EU to remain a sovereign space power and determine its own space ambitions and objectives in support of all EU policies.
- **Focus EU Defence programmes on larger-scale projects** to create critical mass, maximising impact while addressing strategic needs in European defence capabilities (such as missile early warning systems, high-resolution and high-revisit Earth Observation (EO) capabilities enabling data fusion and rapid tasking, Space Domain Awareness (SDA), protected telecommunication systems with harmonised European waveforms, secure Global Navigation Satellite System (GNSS) services, including anti-jamming technologies). A “building blocks” or “incremental” approach would also have several benefits, including the strengthening of a wider EDTIB in Europe, as well as possibly mitigating the risks typically inherent in very large defence procurements, such as complexity of management and schedule delays.
- **Streamline and coordinate processes across defence and space programmes:**

- Establish multi-year work plans within initiatives to provide industries with long-term visibility and better planning capabilities, ensuring continuity between research, development, and procurement phases. Long-term planning and visibility for industry is also necessary to mobilise private investments in the sector;
- Significantly simplify the application, evaluation, and grant processes to accelerate project initiation and implementation through, for instance, standardised procedures amongst Member States (standardised Memoranda of Understanding, a common framework for handling sensitive and classified information across the EU...).
- **Draw lessons from the Galileo PRS and systematically exploit the dual-use potential of the other components of the EU Space Programme**, ensuring it can serve both civilian and military needs effectively (and define clear rules regarding open vs. restricted access and priority allocation). Use this leverage to demonstrate the feasibility, relevance and efficiency of collaboration between Member States to implement space capabilities for defence.
- **Organise a structured coordination** between the European Commission, the European Space Agency (ESA), the EU Agency for the Space Programme (EUSPA), and the European Defence Agency (EDA) to integrate civil and defence developments and ensure a seamless transition from research to operational capability, guaranteeing that the key expertise areas of each of these institutions is exploited to the fullest:
 - **From an industry point of view, given that Space programmes are by essence long-term, complex and risky, the need to have a customer that is technically competent to accompany developments and committed to buy future capabilities cannot be emphasised enough.**
- **Encourage Member States to align national priorities with EU-wide defence strategies** through collaborative roadmaps, from design to procurement, leveraging expertise from initiatives like the Capability Development Priorities (CDP) from the EDA.

Introduction and Strategic Context

Overview of the EU Space and Defence Landscape

Since February 2022 and the Russian invasion of Ukraine, the European Union acknowledged – notably in the Strategic Compass for Security and Defence (issued in 2022) – the **pressing need to enhance the security and defence dimensions of the Union in space**.

On March 10th 2023, the efforts of the EU resulted in the very much welcome publication of the “EU Space Strategy for Security & Defence”; a major and positive event for the sector as it is key to make Europe a real space power.

Published on October 30th 2024, the report from former Finnish President Sauli Niinistö underlines the need for an ambitious new approach to EU preparedness and readiness. In this regard, the space sector is seen as a strategic and essential domain that shall both be preserved and protected, but also constitute a key contributor towards EU preparedness and readiness. Weeks before, Enrico Letta recognised in his report the role of space for defence and security purposes at European level, while Mario Draghi noted that *“coordination and synergies between space and military activities are not fully exploited in the EU”*.

These recommendations will most certainly support the preparation of the White Paper on the future of European defence to be presented by the new European Commission within the first 100 days of taking office. Announced by European Commission President Ursula von der Leyen on July 18th 2024, the White Paper is expected to address defence sector capability issues, industrial competitiveness and investment needs, while also framing the overall approach to EU defence integration, with the aim of strengthening the EU's ability to respond to threats.

The future White Paper is an **opportunity to eventually raise awareness about the essential defence capabilities that are enabled by space**, too often taken for granted or even ignored even though, secure satellite communications, PNT, Earth observation based-intelligence, SIGINT, COMINT, ELINT, ballistic missiles early warning or Space Situational Awareness, are critical to enhancing Europe's defence autonomy, the success of military operations and ultimately, “securing Europe”.

The contribution of space to defence and security, once an elephant in the room, is no longer considered taboo at European level. Defence budgets are on the rise, EU programmes (e.g., European Defence Fund, European Defence Industry Reinforcement through Common Procurement Act, European Defence Industry Programme) are stepping up their ambitions to sustain common defence procurement, and influential voices within the EU are calling for the space sector to increasingly contribute to European defence and security capabilities.

Integrating space into a broader defence framework will ensure that the EU capitalises on its strategic assets, strengthens industrial robustness in the space sector, and supports innovation to meet emerging security challenges.

Objectives of this Position paper

While space and defence have long been embedded in large aerospace and defence conglomerates, as well as in medium-sized and specialised companies that dominate both sectors, the domain remains relatively new for the EU. The stronger role exerted at the national level compared to EU Space Flagship Programmes adds to the challenges faced by the European space industry.

The European space industry, represented by Eurospace, believes that **it is now high time for the sector to be more involved and active in the field of “defence” at a joint European level** (i.e., the defence synergies that can exist with the EU space programme, of civilian nature, as well as, obviously, the potential of the EU defence-related instruments to contribute to the development of space-based capabilities).

The following Position Paper therefore explores the critical role of the European space industry in shaping the future of space and defence integration within Europe. It addresses key questions related to cooperative defence applications, synergies between the EU Space Programme and the multiple EU defence instruments¹, and the evolution of technologies, policies, and governance to meet defence needs.

It also examines the challenges and opportunities in developing multilateral defence capabilities and considers the role of Eurospace in identifying and promoting capabilities, aligning regulatory frameworks, and facilitating collaboration with national Ministries of Defence, the European Commission or the European Defence Agency.

¹ Besides, between the instruments under Commission-led governance (EDF, EDIS-EDIP, EDIRPA..) and the others under Member States-led governance (PESCO, CDP, CARD, EPF...), whose purpose are variable, there might very well be a risk to have too many instruments, generating overlaps, and hence, a need to streamline.

Integration of EU Defence and Space Instruments

Synergies Between the EU Space Programme and Defence Instruments

The EU Space Programme and EU defence instruments have a **huge potential for synergies**, calling urgently for strategic integration across policy, programmatic, and technological domains.

At the same time, the existence of potential synergies should not lead to try and simply merge portions of civil and military instruments under the same umbrella. For R&D, for instance, this “dual-use research” approach would be problematic, because (i) the military technical requirements are much stricter than their civil equivalent and (ii) the working environment required by defence R&D programmes such as the EDF generates specific burden to the project (e.g., in terms of personnel and site clearances, handling of classified information, compliance with different country-specific rules). This would translate into higher project costs and would exclude good technological partners who are not cleared or structured to work in the defence field.

In general, future initiatives of the EU in space (new programmes, as well as the evolution of existing ones) should **focus on strengthening and diversifying European industrial capabilities** – provided that enough activities, to ensure a sustainable business, can be entrusted to multiple providers –, **ensuring European preference, fostering technological independence and improving resilience of the supply chains**.

In this context, the components of the EU Space programme financed through the next Multiannual Financial Framework (MFF) should serve both civil and military needs to maximise efficiency:

- **Access to Space:** as a critical enabler of all other space programmes, access to space should be reinforced within the MFF through a dedicated programmatic and budgetary line. The goal should be to sustain European launch capabilities tailored to European needs through:
 - Aggregation of launch opportunities to create an economically sustainable critical mass of institutional missions;
 - Market predictability for sovereign domestic needs through long-term mission planning embedded in both current (in particular IRIS²) and future flagship programmes (see below).
- **Earth Observation:**
 - Although not aiming at answering defence-related needs, the Copernicus programme could offer useful capabilities for defence purposes, provided that the rules to access data are clearly established and that integrity of the data can be ensured;
 - As indicated in the “EU Space Strategy for Security and Defence”, the EU should develop a frequent revisit Earth Observation Governmental Service (EOGS) with multiple sources capabilities (optical, Synthetic Aperture Radar, hyperspectral...), which will require to establish an architecture to process and manage the inflow of data from a variety of space-based Intelligence Surveillance and Reconnaissance (ISR) sources, as well as well-defined data access and distribution policies to deliver the information to the accredited users.
- **Secure Telecommunications:**
 - Leverage IRIS² and GOVSATCOM for military applications, enabling secure, multi-domain, and multi-orbit communication. Connections with projects like the EDF “European Protected Waveform” and its successors could obviously enhance these capabilities.
- **Space Domain Awareness / Space Situational Awareness (SSA):**
 - Expand the dual-use of Space Surveillance and Tracking (SST) capabilities (with, e.g., radio frequency and optical space-based sensors) in order to achieve the quantity and quality of data enabling for an autonomous decision-making. In this context, the role of the EU SST Partnership should be clarified.

- **In-Space Operations and Services (ISOS):**
 - Pursue dual-use of ISOS technologies for satellite refuelling, maintenance, debris removal, and mobility, including via future EDF and Horizon Europe initiatives in this domain. In addition, enhancing the protection and survivability of European space systems against potential threats, including jamming, cyberattacks, and collisions is of paramount importance.
- **Global Navigation Satellite System:**
 - Strengthen secure GNSS services, including anti-jamming technologies and resilient systems like Galileo Public Regulated Service (PRS) and LEO-based Positioning Navigation and Timing (PNT) infrastructures, to support precise military operations. It is now important to ensure the availability of PRS receivers for military use while ensuring the integration of these receivers into the weapon (i.e., ensuring the military user uptake).

To effectively address the needs of defence users through EU space capabilities, advancements in technology, policy, and governance are essential:

- **Technology Enhancements:**
 - **Dual-use technologies:**
 - Align military and civilian systems with built-in interoperability to integrate EU systems into European military planning;
 - Foster technology transfer and research collaborations across civil and defence sectors, particularly in Artificial Intelligence (AI), quantum computing and cryptography, and cybersecurity, to drive innovation and maintain European competitiveness;
 - Programmatic dual-use synergies: allow for contributions from various budgetary instruments towards a single capability development, e.g., EDIP and an ESA optional programme, or EDF and the EU Space programme.
 - **Robust and secure systems:**
 - Develop advanced encryption (e.g., Quantum Communication Infrastructure for IRIS², Galileo PRS) and cyber-secured, anti-jamming capabilities for satellites and ground assets;
 - Introduce prioritised bandwidth allocation to ensure reliable access during crises.
 - **The case of cybersecurity:**
 - A joint governance of cybersecurity requirements between National Cybersecurity Agencies and national MoDs reflected in an aligned Cybersecurity Certification Framework (instead of individual requirements per MoD and space missions) would foster dual use by many European MoDs, governments and commercial parties. Dual use of e.g., trustworthy EO data for Situational Awareness or communication networks (like IRIS²) for governmental, defence or commercial applications like autonomous driving and flying requires an alignment of cybersecurity requirements along the supply chain (otherwise MoDs will simply not make use of such data or communication networks);
 - A robust cybersecurity framework would not only strengthen the sovereignty of Europe, as secure European space solutions could additionally help opening foreign institutional export markets.
- **Policy Adaptations:**
 - **Guidelines for dual-use systems:** establish clear procedures for use of civilian-intended systems for defence, define open vs. restricted access and priority allocation during conflicts;
 - **Coordination across levels:** Strengthen links between the EU Space Programme, defence instruments, and Member States to streamline the development of dual-use technologies;

- **Ability to host national sovereign applications:** common platforms and support services that preserve independence and autonomy to “black box” packs of on boarded hardware and software;
- **Future-proof Space Act:** Define coherent approaches to space safety, security, and sustainability, ensuring governance supports both civil and military uses.
- **Governance evolution:**
 - **New structures for defence access:**
 - Create governance mechanisms allowing rapid access to EU space assets for defence purposes while disrupting as less as possible civilian operations;
 - Develop continuity protocols to avoid service interruptions during crises (which would first require a thorough assessment of the “threat response mechanism”² to identify possible gaps).
 - **Centralised defence requirement management:** Gather and articulate military requirements in a coherent manner to support the evolutions of the relevant components of the EU space programme, for instance via EDA;
 - **EU-NATO interoperability:** facilitate the interfacing of EU and NATO systems to enhance strategic cohesion and defence readiness; concretely, start by coordinating the list of needed capabilities with NATO, but being careful to avoid the risk of the EU industry to be side-lined (procurement of US or UK off-the-shelf solutions) by addressing solely the NATO capability targets.
- **Military training and demonstrating defence use cases:**
 - Regularly conduct **military exercises and wargames** incorporating EU systems to instil confidence and operational familiarity. Use exercises to validate the reliability and effectiveness of technologies and governance concepts, fostering trust among military users;
 - Define and test **defence use cases** through simulations and live scenarios, ensuring that space systems meet operational military needs.

Key new cooperative defence capabilities identified by Industry

In addition to the synergies to be identified and implemented to improve the relevance and usefulness of the EU Space programme to defence users, **additional space-based capabilities are quickly needed in Europe** to fill significant gaps in the space component as a pillar of European defence and security. Based on already existing initiatives launched recently, some of these are perfect candidates for the development of new cooperative (/multilateral) defence capabilities at European level:

- **Space-Based Missile Early Warning Systems:**
 - Based on currently ongoing initiatives in the frame of the EDF, such as “ODIN’S EYE”, developing a European-wide space-based missile early warning system is a top priority, ensuring the necessary level of preparedness for potential ballistic missile threats to European citizens and critical infrastructure.
- **Intelligence, Surveillance, and Reconnaissance (ISR):**
 - Enhancing EO systems for defence applications (such as with the introduction of the Earth Observation Governmental Service) to enable early warning, intelligence gathering, climate-security assessments, and conflict preparedness is urgent (and could be implemented by building for instance on EDF “SPIDER” project):
 - Developing high-resolution and high-revisit capabilities using multiple sensor types (optical, radar, hyperspectral);

² EU Council Decision 698/2021

- Improve radar and hyperspectral image processing for enabling a true and actionable all-weather and day/night capabilities;
 - Enabling data fusion and rapid tasking-to-information cycles for actionable intelligence;
 - Fostering specific applications for border security, critical infrastructure monitoring, and military operations.
- **Secure Military Satellite Communications (MILSATCOM):**
 - Developing protected communication systems with harmonised European waveforms;
 - Integrating 5G for defence applications and aero connectivity for military platforms;
 - Low latency communications to ensure real-time responsiveness in critical military operations;
 - Enhanced encryption and cybersecurity measures to protect against evolving threats and ensure secure transmission of sensitive data.
- **SDA/SSA:**
 - Expanding into Space Domain Awareness for threat monitoring and characterisation, and protection of space assets, integrating military operational concepts and emerging technologies for comprehensive threat management. Projects like EDF23 “EMISSARY” align well with this vision, as should the PESCO “EU-SSA-N”.
- **Sustainability and Resilience of Space Operations:**
 - Developing dedicated, and secure, interfaces for in-orbit servicing, including maintenance, repair, and refuelling to ensure the longevity and operational integrity of defence space assets, in particular during crises (and taking into account that ISOS is typically using dual-use technologies, tailoring the CONOPS to the different use-cases);
 - Enhancing the protection and survivability of European space systems against potential threats, including jamming, cyberattacks, collisions, including from natural events as well as intentional actions;
 - Ensuring availability of space capacities even in case of loss or damage of assets, as well as to provide critical space capabilities to the warfighter at operational and tactical levels, and not only at the strategic level. In more general terms, the goal is to provide more flexible and affordable space solutions to users, military and civil; this entails responsive access to and use of space.
- **Space-based “NAVWAR”:**
 - Building on the ongoing initiatives within the framework of the EDF, such as “NAVGUARD”, and leveraging developments in Galileo and LEO PNT, develop a comprehensive EU NAVWAR capability: this capability will rely on space-based surveillance to complement current European systems, thereby strengthening the resilience of the future Galileo PRS service for military applications. Additionally, develop the user segment utilised by the armed forces of EU Member States to achieve a comprehensive global capability that simultaneously addresses resilience, surveillance, countermeasures, and offensive measures.
- **Space-Based Aerial Situational Awareness:**
 - Developing Air Moving Target Indicators to transfer Airborne Warning and Control System (AWACS) functions to space-based platforms.

Challenges and Obstacles in Multilateral Defence Projects: Lessons Learned from Industry Experiences

In short, Industry experience in several projects aiming at developing multilateral defence capabilities has shown that these **projects lead to significant challenges** such as balancing national sovereignty concerns – particularly around data sharing and sensitive mission requirements – and balancing the industrial workshare to address the disparity in resources and ambitions among Member States. Collaborative frameworks often lack stability and are prone to delays due to prolonged negotiations and complex funding mechanisms. In more detail, the following elements have been identified as obstacles to the efficient development of multilateral (space) defence capabilities in the ongoing EU programmes.

- **Sovereignty Concerns:**
 - There is often resistance to share sensitive data or missions without pre-arranged bilateral or multilateral agreements or frameworks among Member States;
 - Some Member States prefer expanding their national capacities over contributing to shared efforts.
- **Funding and Commitment:**
 - Too often, budgets are very limited and the financial commitments are hard to secure, especially for initiatives perceived as “test cases”;
 - Differences in national budgetary cycles and political decision points substantially delay progresses and, more generally, establishing shared funding mechanisms for defence-focused space initiatives is challenging.
- **Governance:**
 - Involvement of numerous countries and industrial partners inevitably slows decision-making and development. In particular, balancing industrial efficiency with some political needs, such as equitable workshare and inclusion of many Member States, is often taking a very long time and results in overly complicated arrangements, as are the definition of clear rules for priority allocation and for the use of new capacities, or for export control;
 - Difficulties are encountered when establishing a governance framework that ensures rapid access to shared resources without undermining individual sovereignty. More generally, building trust among Member States to share sensitive data and capabilities, and ensuring equitable access to shared systems is a task that can take a very long time. This sometimes can negatively impact the planned schedule and timeframe of the projects, which would then require additional funding to progress.
- **Technical and operational hurdles:**
 - Interoperability Issues: integrating legacy systems with the newly developed joint capabilities is not obvious and too often overlooked, as is the need to develop standardised solutions that cater to diverse national requirements (to avoid multiple versions of a single design).

Limitations existing at Member States level

Given their preeminent role in defining defence policy objectives and prioritising defence-related capabilities on the one hand, and their competence in space policy on the other hand, **EU Member States have de facto and unquestionable role** in defining what will ultimately be done in Europe regarding the integration of space and defence.

So far, Member States expressed mixed sentiments toward the promotion of space-based capabilities within EU defence instruments, reflecting a blend of opportunities and reservations (and operational challenges, see above):

- **Challenges in engagement and understanding:**
 - **Reliance on US data:** there is, within European countries, a culture of overreliance and dependency on space data provided by the US either publicly (i.e., SSA data through Space-Track.org) or through NATO channels (e.g., Early Warning data through the Shared Early Warning (SEW) system). In addition, most Member States prefer having bilateral MoUs with the US giving the impression of being self-sufficient, and a lack of incentive for engaging in EU solutions;
 - **Limited awareness about the significance of space capabilities for defence:** many Member States lack a comprehensive understanding³ of the strategic importance of space-based capabilities, with only very few countries having deeply ingrained traditions in this domain. This results in uneven levels of interest and engagement;
 - **Risk of marginalisation:** the inclusion of space within a potentially much broader EU defence budget may risk its relegation as a secondary priority, particularly in light of the urgent needs driven by the conflict in Ukraine. Besides, the mindset is still not yet clear within the EU to consider space (and cyber), as equivalent domains to air, sea and land;
 - **Institutional barriers:** more generally, feelings of “tepid enthusiasm” and “institutionalised mistrust” toward EU-level defence initiatives do persist among some Member States, reflecting concerns over transnational dependencies and political leanings.
- **Recognition of the need for collaboration:**
 - **Consensus on cooperation:** generally speaking, Member States acknowledge that no single nation can independently develop the full spectrum of space-based defence capabilities needed to address modern challenges. Collaborative projects are still recognised as key to leverage shared expertise and resources. Nevertheless, Member States remain cautious about preserving national sovereignty, particularly for secure communication systems and intelligence sharing/governance structures, underscoring the need for technological solutions that safeguard their own strategic autonomy.
- **A lack of structured (multi)national exercises**, engaging industry as well:
 - While discussions and consultations occur, there are not (yet?) systematic multinational-level initiatives resembling a cohesive “mapping” or strategy to focus EU efforts on defence Projects of Common Interest;
 - More generally, the absence of formalised MoD-led working groups to engage industry stakeholders’ limits transparency and alignment of priorities.

... and proposals to overcome these limitations

Mapping Member States ambitions

Mapping individual Member States’ ambitions and capabilities could play a pivotal role in aligning national priorities with EU-level defence strategies. A detailed assessment of space-based capabilities already known to already attract the interest of national MoDs could be a useful contribution to the European Defence Agency (EDA) Capability Development Priorities (CDP) framework to align these capabilities with EU objectives. Such an effort would foster collaboration through strategic roadmaps, highlighting EU strengths and addressing gaps in space defence capabilities. From what is known today by Industry, it is already possible to identify some country-specific domains of interest; some are linked to currently existing EDF projects involving several Member States, underlining the positive trend towards greater cooperation on which we should collectively build.

³ The dual nature of space often blurs the identification of the decision makers and appropriateness: space is addressed whether by Ministries of Economy, or Scientific Research, or Telecommunications, or Transport but also by Foreign Affairs...and finally by MoD’s

Some topics, such as active defence in space, remain very sensitive and are considered sovereignty issues by certain Member States.

Improve coordination amongst National Security Agencies

Ensuring a **unified perspective on the necessary actions and developments in the security and cybersecurity domain** from the project's inception could streamline the processes and could also ensure better take-up at later stages. Structures like the Security Accreditation Board, hosted by EUSPA, and under Member States control, could be used for this purpose.

Improve consultations with Industry

Member States should be encouraged to emulate initiatives such as the one existing in Spain, with a roadmap approach explicitly **defining and aligning national defence and space priorities with EU-level funding mechanisms**.

EDA workshops could be leveraged to foster discussions between industry and Member States – combining the industry's bottom-up proposals with top-down guidance from MoDs – to improve coherence in project selection, ensure funding commitment, and prioritise projects with strong cross-border relevance.

More generally, Industry recommends being provided with greater visibility into the rationale behind MoD and Commission decisions regarding co-funding priorities, timelines, and project inclusion in EU programmes.

Recommendations for enhancing EU Defence Instruments

With only a few years of hindsight, and despite a very limited initial budget, the **EDF is seen by the European space industry as an instrument that has made positive contributions to the development of new capabilities.**

- It helped promoting joint development and cross-border industrial cooperation among Member States, industry, and research institutions, fostering innovation in defence technologies, as well as interoperability and standardisation;
- EDF projects effectively translate some of the European Defence Agency's Capability Development Priorities into actionable projects, helping address identified capability gaps; furthermore, EDF has emerged as the primary implementation tool for PESCO (although the involvement of EDA in EDF continues to look “informal” for unclear reasons);
- EDF improves harmonisation of capability requirements and common technical specifications; in some cases, military personnel have contributed to operational concept definitions (CONOPS), which ensures mission-relevant outcomes and end-user buy-in; this would probably deserve being formalised in further iterations;
- By encouraging the participation of SMEs, it helped diversifying and strengthening the EDTIB.

In general, EDF is a significant new tool of great value for cooperative defence R&D and for industrial participation, but **its structure for implementation should be simplified and made more lean and agile**, both from the Commission and from the MoD side. Industry, especially projects coordinators, are caught in the bureaucratic maze between the two. Administrative complexity, funding dilution, and insufficient continuity hinder the full potential of this promising instrument. Hereunder is the non-exhaustive list of the issues and obstacles identified by Industry:

- **Administrative burden and complexity:**
 - EDF projects are hampered by extensive administrative requirements and slow timelines. Moreover, the national co-financing element of some projects launched 4 years ago are still not secured, which is a massive problem for industry;
 - National-level coordination and co-funding mechanisms are of course adding further complexity and delays.
 - **Possible mitigation measures:**
 - Simplify application, evaluation, and grant processes to reduce delays and allow faster project initiation;
 - Standardise MoUs between Member States to facilitate smoother processes and timelines.
- **Limited competition and innovation:**
 - The consortium-building process is cumbersome, with overly large groups (sometimes 30+ participants), diluting the focus and reducing efficiency.
 - **Possible mitigation measures:**
 - Encourage more open (and “incremental”) calls to attract innovative solutions;
 - Improve the balance between the necessity to involve a number of participants and the scope of the calls
- **Dilution of funding:**
 - Dispersing funds across numerous small-scale projects diminishes the critical mass needed for impactful results;
 - Misalignment between the timing of EDF grant and the Member States co-financing is a critical and challenging part;

- The reimbursement-based funding scheme requires co-financing, creating financial challenges for industry participants.
- **Possible mitigation measures:**
 - Increase critical mass by focusing funding on fewer, larger-scale impactful topics, envisaging also a “building blocks” or incremental approach.
- **Lack of continuity and strategic roadmaps:**
 - There is insufficient long-term visibility in future EDF annual Work Programmes, limiting industry's ability to plan effectively for the long term. This lack of visibility also limits potential for industry to obtain private investments;
 - There is no explicit mechanism to manage multiannual projects and phased approaches; the lack of mechanisms for continuation of some initiatives is detrimental;
 - Discontinuities between EDF and procurement phases create a “valley of death” where projects fail to transition from R&I to industrialisation (a known problem that EDIP, for instance, is supposed to tackle).
 - **Possible mitigation measures:**
 - Establish multi-year calls or dedicated budget lines to ensure long-term project continuity;
 - Bridge the funding gap between R&I and industrial procurement phases;
 - Develop and implement capability roadmaps with Member States and industry input for better alignment with strategic priorities. Apply the notion of “over-and above” capabilities similarly to NATO i.e. those capabilities useful to enhance interoperability and too costly/complex to be developed by a single nation (those could be identified within EDA's CDP and promoted as EU critical infrastructure/flagships); Galileo and IRIS² are already good examples;
 - Improve collaborations (interoperability) with NATO and enhance dual-use synergies between civil and defence sectors;
 - The balancing between disruptive innovation and the provision of practical and scalable results should be improved, to avoid a perception of lost innovation opportunities, while allowing rapid applicability and uptake.
- **Security issues:**
 - Handling sensitive or classified information often lacks a coherent EU framework (or a limited willingness to implement the one existing?), eroding trust and creating additional difficulties;
 - The late definition of the security framework during the Grant Agreement phase is often leading to inadequacy of the initial costing exercise performed during the proposal preparation phase as well as potential ineligibility of entities (e.g., due to higher classification levels); besides, different levels of security frameworks are sometimes not harmonised between the different MoDs;
 - Granting of export licenses is sometimes difficult, thus complicating transfer of information within consortia.
- **Role of Member States (MoDs):**
 - Due to the strong disparities amongst the few space-fairing nations and the others, not all national Ministries of Defence (MoDs) have sufficient technical expertise, which can cause issues of trust and delays.
 - MoDs sometimes delay co-funding agreements, causing significant cash-flow issues for industries and risking project discontinuity.
 - **Possible mitigation measures:**
 - Provide technical training and resources to MoDs to ensure consistent and meaningful involvement in the EU programmes;
 - Synchronise grant agreements with Member States' co-funding timelines.

Way Forward

Future goals under the current and next Multiannual Financial Framework (MFF)

Industry considers important – and achievable – to demonstrate progresses regarding a better integration of space and defence through the EU defence instruments. Industry draws the attention of EU authorities on the fact that, given the already existing competences and institutional structures at EU level, the already existing EU programmes in space and the good European integration of the space supply chains, **space could serve as an example to achieve “quick wins” in the further development of capabilities for defence and the relevance of EU defence instruments.**

Current MFF Objectives (2021-2027)

- **Under the EDF:**
 - **Fostering innovation in Critical Technologies:** Encourage the development of advanced technologies in areas identified in the EU Capability Development Priorities; quickly launch projects on rapidly evolving domains such as on-board processing and AI;
 - **Advancing EU Autonomy and Competitiveness:** Strengthen Europe’s capacity for independent space security and dual-use capabilities, ensuring interoperability with NATO while bolstering the EU’s strategic autonomy;
 - **Streamlining EDF Processes:** Implement feedback from the mid-term review to improve procurement frameworks, reduce administrative burdens for coordinators, and make participation more attractive and agile for industry.
- **Under the EDIP:**
 - **Laying the foundation for space-defence projects:** ensure a dedicated support for space-based defence capabilities in EDIP’s pilot phase (2025-2027), leveraging results from ongoing EDF projects like EMISSARY (following SAURON), ODIN’S EYE, SPIDER, REACTS...
 - **Responsive space development:** Push for dual-use technologies that ensure resilience, readiness, and sustainable operations in defence and civil applications, leveraging capabilities across operational domains (land, sea, air, cyber, and space);
 - **Promoting European preference and eligibility:** Define and enforce clear eligibility rules to prioritise European suppliers and capabilities while establishing rigorous standards for data security and technology transfer.

Future MFF Goals (2028 and beyond)

- **Long-Term EDF and EDIP Planning:**
 - **Enhanced EDF relevance and budget:** Secure increased funding to expand the scope of the EDF, enabling larger and more impactful R&D programmes across space domains, taking stock of, notably, the EU Capability Development Priorities, EDA Foresight 2040...
 - **EDIP Phase 2 financing:** Ensure dedicated budgets for space-defence projects, leveraging a proposed funding line of up to €500 billion in the next MFF as indicated multiple times by Commission President Ursula von der Leyen, including for large-scale space-defence initiatives.
- **Advancing key space-defence projects:**
 - Focus on high-revisit constellations (optical, SAR, and hyperspectral), space-based missile early warning (SBMEW), space-based surveillance systems (SBSS), and SSA infrastructure (ground- and space-based) to enhance Europe’s overall defence readiness (**space for defence and defence for space**);

- Support frameworks for in-orbit servicing to ensure **long-term operational sustainability and resilience** of critical infrastructure.
- **Improved planning and collaboration:**
 - **Long-term visibility for EDF Work Programmes:** Need for multi-annual programme visibility to facilitate better planning and preparation for industry participation;
 - **Increased synergies between EDF and EDIP:** Integrate civil and defence developments where appropriate, such as responsive space capabilities in civil space programmes and standardisation to strengthen the supply chain. EDF should serve as the R&D counter-part to EDIP, acting as first station for the harmonisation of capability requirements among EU Member States, as an incubator for low TRL technologies and as a developer for the high-priority capabilities currently lacking in the EU; EDIP, on the other hand, will concentrate on delivering these capabilities in a joint manner, at the required speed and scale.
- **Industrialisation and implementation:**
 - Focus on **transitioning successful EDF projects into operational capabilities** adopted by Member States, ensuring industrialisation and large-scale implementation of initiatives. Within EDIP, the Structures for European Armament Programme (SEAP) framework could provide a key tool with an end-to-end approach from harmonisation of requirements and R&D to actual procurement, reducing complexity and limitations.

Structures needed to successfully implement space-based defence capabilities

The development of new space-based defence capabilities, as well as the use, for military activities, of space systems will require new or updated governance mechanisms, or even institutions.

The military-use of space systems might potentially involve a federation of European Space Commands, or Joint space commands (not unlike the EU SST Partnership – whose lessons also need to be assessed). On the other hand, the development, through multilateral collaborations, of new space systems for defence uses will add another layer of complexity to the already existing challenges of any space development programmes.

From an industry point of view, given that Space programmes are by essence long-term, complex and risky, the need to have a customer that is technically competent to accompany developments and committed to buy future capabilities cannot be emphasised enough. Hereunder are some key characteristics and competences for the institution(s) in charge of implementing future defence-related developments in space:

- **Technical expertise and capabilities:**
 - Proficiency in dual-use and emerging defence technologies (e.g., satellite communications, ISR, space situational awareness, space-based missile early warning);
 - Proven ability to manage sensitive and classified information securely.
- **Agile project management:**
 - Flexible and efficient governance structures to adapt quickly to changing needs;
 - Streamlined administrative processes to reduce delays and focus on outcomes.
- **Collaboration and coordination:**
 - Strong track record in coordinating with public and private sectors, avoiding redundancies, and fostering interoperability;
 - Capability to leverage synergies between civil and military applications.
- **Transparent and inclusive governance:**
 - Clear decision-making frameworks with balanced stakeholder representation, including Member States and MoDs;
 - Continuous feedback loops for monitoring progress and adapting to evolving sector requirements.

Provided that agreements exist between key institutions to clarify roles and streamline project implementation while ensuring that military user requirements are met, it would seem wise to **prioritise strengthening existing institutions and roles instead of creating new agencies**, to save time and minimise resource dispersion.

Lessons should be drawn from governance models like Galileo PRS and IRIS², and like the EU Satcom Market, EDA GOVSATCOM Demo, the functioning of the EU SatCen... to refine governance and sharing mechanisms. In particular, drawing lessons from ESA's past dual-use developments and optimising ESA's alignment with the EU's programmes (space and those on defence) can maximise the impact of dual-use investments. Indeed, **ESA's role as a space development agency should not be overlooked**: it has experience in several security-related projects (Galileo PRS, SAGA, Launcher development, testing of Helios in ESTEC, IRIS², Govsatcom, several cooperation projects with military communities in EDA etc.).

The fact that, now, Member States are expected to have needs in space that would be more and more related to security & defence does not fundamentally change the situation for ESA: **it could remain the Agency in charge of developing space-based security & defence (non-offensive) capabilities, based on Member States requirements**. The ESA system has proven solid and agile enough for the most demanding developments pertaining to European autonomy and security. Arising challenges to ESA being a player invested in European defence can probably be managed via the agility of the ESA Convention (under which key systems such as Ariane and PRS were made). In this scope, issues such as data segregation, devolution of operations, involvement of national security agencies, and Member State *à la carte* participation, can be tackled through e.g., an ESA Security Configuration. Given the nature of these capabilities, it is expected, though, that the role of the Member States will be more important in defining the programme proposals and specifying the requirements than it is currently the case for more "traditional" programmes presented by ESA DG for subscriptions at Ministerial Council meetings.

Additionally, **EUSPA could play a critical role when it will come to the exploitation of future capabilities** (but will definitely require additional resources and enhanced space defence expertise) while EDA's existing mandate aligns with Member States defence needs, but its intergovernmental nature can limit its role at the EU level: **strengthening EDA's framework and collaboration with the European Commission could bridge this gap**. Finally, when it comes to defence procurements, the expertise of the Organisation for Joint Armament Cooperation (OCCAR) in managing the procurement of defence capabilities could be adapted to space-defence programmes.

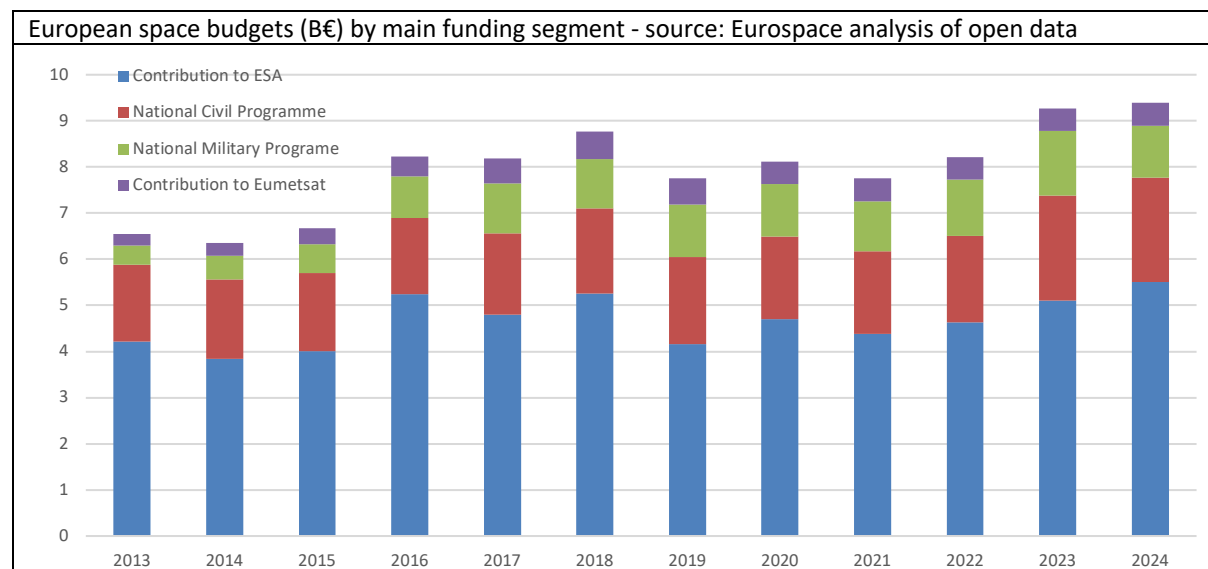
It is of course traditionally not the role of the private sector to comment on the respective role of institutions, but the nature of space programmes absolutely requires that Industry could interact with an experienced and technically competent customer capable of managing risks and long-term activities, provided that sufficient agility in programme management can be reached, as well as a clear segregation of duties.

Of course, these considerations do not exclude the potential relevance of new structures; in particular, an **agency ensuring a "DARPA-like" function** – that has been discussed in Europe since ages – could bring a much welcome opportunity to integrate cutting-edge research and rapid implementation for space and other defence domains; this could be implemented with the current institutions and agencies with some legal adaptations. But we need to keep in mind that **the most important problem within the EU**, more than a lack of R&I instruments, **is the inability to actually jointly develop and then procure capabilities**.

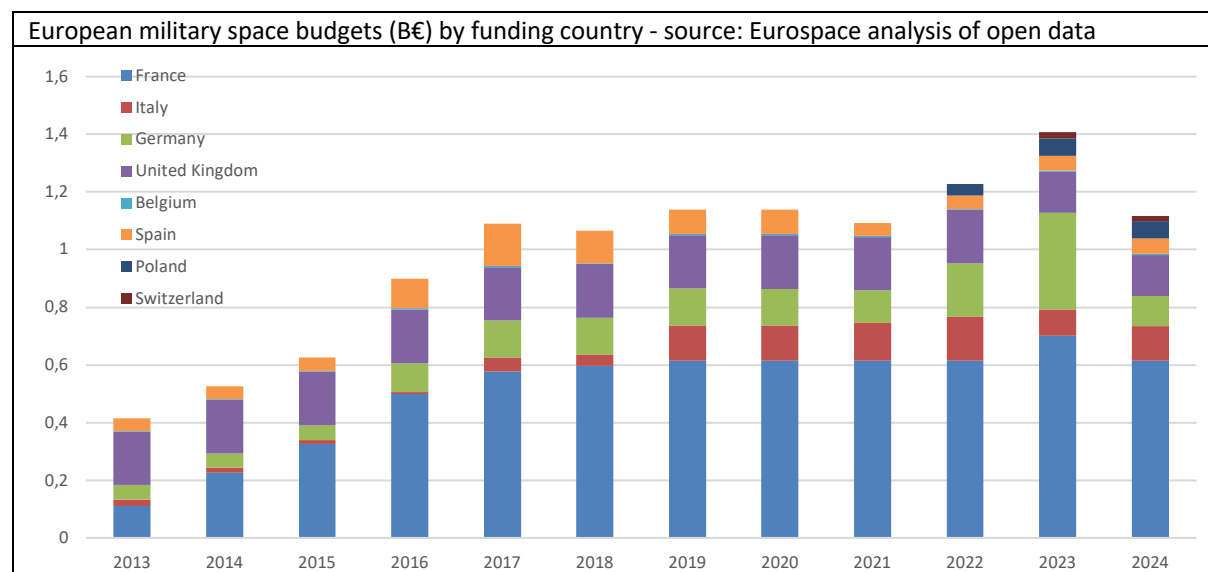
Annex – Space/Defence in figures

This Annex aims at highlighting the orders of magnitude of European and global activities related to space and defence, using data from Eurospace.

Starting with European institutional budgets, if there has been a slight increase of budget towards national military programmes, one can see that space in Europe is mainly a civil domain. For space and defence activities, three countries are leading public investments in Europe (France, and to a lesser extent the UK and Germany). Note that in both charts, the acquisition of satellite services under defence procurement is not included (i.e., it only includes budgets for space systems development and procurement).



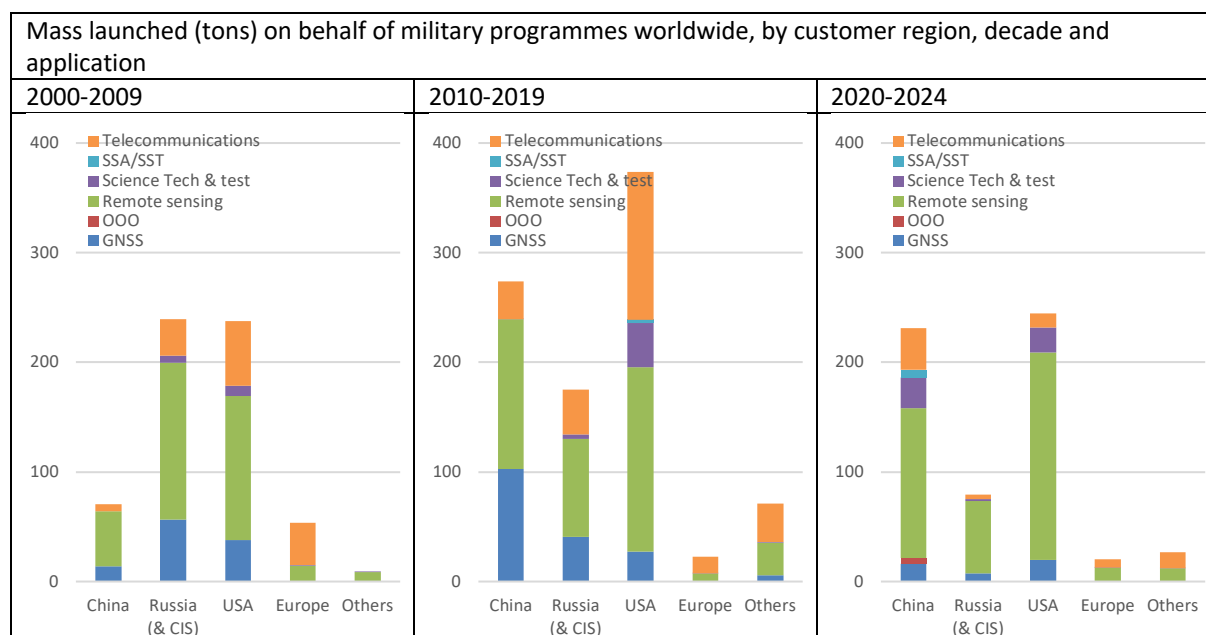
The funding of Military space programmes in Europe is still organised almost exclusively at national level, even if some measure of international cooperation eventually takes place, as with the Athena-Fidus programme where Italy and France have joined forces. We note that the most of the effort devoted to deploying military space infrastructure originates from France, with Germany, the UK and Italy also doing their share. We see new interest for military space systems arising in Europe, with Poland, and Switzerland looking at deploying their own capabilities.



When looking at the mass of military spacecraft launched into orbit⁴, the proportion of European military spacecraft is very thin. The strategic nature of space programmes has always been strongly embedded in the strategies of other space powers; on top of which the USA, but with a rapid and steady progress of China in the recent years. Please note that the big increase of the US launched mass between 2023 and 2024 is the consequence of the SpaceX Starshield programme.



As seen in the charts below, in just half a decade (2020 to 2024), global space powers have deployed as much mass in orbit as in the 2010-2019 period. Military space programmes are clearly accelerating, fuelled by China and the USA. The main focus is on Remote sensing - including all aspects of image intelligence (e.g. optical and radar observation, and signal intelligence (or the tracking, eavesdropping and monitoring of the RF spectrum).



⁴ Spacecraft launched, in mass at launch, is a very good indicator of space activity. Indeed, for all means and reasons all spacecraft systems are optimised, with mass at launch being a major criterion. The mass to be launched is also a major driver for the launch services market; It is therefore a primary indicator of space activity of very good quality and relevance.