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**European Defence Fund**  
**Indicative multiannual perspective 2021-2027**

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## European Defence Fund indicative multiannual perspective

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## 1. INTRODUCTION

The European Defence Fund (EDF) multiannual perspective is intended to facilitate the coordination of the Member States and associated countries<sup>1</sup> long-term planning for the EDF, especially for large capability projects that would need to be supported through several work programmes over the EDF duration. It presents **main outcomes that are expected from EDF 2021-2027 support per category of actions**.

In addition, in order to allow industry and Member States to focus and invest into cooperation in a more structured and transparent way, the following table provides percentage indications of the EDF budget envisaged to be allocated to some categories of actions throughout the current multiannual financial framework (2021-2027), without prejudice to the other categories of actions which may be addressed in the successive EDF annual work programmes depending on the discussions with Member States in the EDF Programme Committee.

**The EDF multiannual perspective is indicative.** It does not constitute or generate any commitment from the Commission. The table below and the content of the multiannual perspective will be revised annually according to the discussions leading to the preparation of the successive annual EDF work programmes and subject to the availability of annual budget appropriations. In line with the Action Plan on Synergies between civil, defence and space industries, the envisioned technology roadmaps expected to be issued by the Commission in follow-up to the reports of the Observatory of Critical Technologies and synergies with other initiatives at EU level should be taken into account where relevant, as well as any need to ensure synergies with other initiatives at EU level.

Category of actions	Indicative EDF budget contribution during 21-27
1. Defence medical support, CBRN, biotech and human factors	
2. Information superiority	> 10 %
3. Advanced passive and active sensors	
4. Cyber	
5. Space	> 10%
6. Digital transformation	
7. Energy resilience and environmental transition	> 5%
8. Materials and components	
9. Air combat	> 10%
10. Air and missile defence	> 5%
11. Ground combat	> 10%
12. Force protection and mobility	
13. Naval combat	
14. Underwater warfare	> 10%
15. Simulation and training	
16. Disruptive technologies	4% - 8%

<sup>1</sup> Member States and associated countries are hereafter referred to as Member States.

## 2. INDICATIVE PLANNING PER CATEGORY OF ACTIONS

### 2.1. Defence medical response, Chemical Biological Radiological Nuclear (CBRN), biotech and human factors

Medical response and CBRN capability development are characterised by a constant flow of innovation, which is the result of a high level of research and development within the industry and specialised research organisations, and of close co-operation with the users, notably Member States' medical and CBRN commands/centres. The European defence industry generally acts as integrator of civil solutions in offerings to military customers. Considering the high competition particularly with companies from North America and Asia, as well as its reflection in Member States (MS)' and European defence capability priorities, a sustained level of investment at European level is very relevant in this domain. Special attention is therefore given to the continuous and strategic development of capabilities in the areas of Detection, Identification and Monitoring of CBRN threats as well as development of medical CBRN countermeasures.

#### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential Research and Development (R&D) topics to be addressed in future annual work programmes, the EDF ambition in the *Defence medical response, CBRN, biotech and human factors* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- CBRN system of systems (standardisation) and technologies integration
- Set of available defence medical countermeasures procured jointly

### 2.2. Information superiority

Information superiority is essential for any operation, as it concerns the entire cycle of the military decision-making process, with ever shorter timelines and an ever-increasing amount of data to collect and process. It addresses a broad range of technologies and capabilities allowing command entities at all levels to base their decisions on suitable, timely and accurate information and to transmit information swiftly and securely to the relevant actors. In the context of the EDF, joint R&D actions regarding information superiority will support the enhancement of the Union's freedom of action in the field of command, control, communications and computing (C4), Intelligence, surveillance, target acquisition and reconnaissance (ISTAR), but also joint electronic warfare, hence reinforcing the strategic autonomy of the Union. The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to information superiority to more than 10% of the total EDF budget.

In line with the Action Plan on Synergies between civil, defence and space industries, possible synergies with other initiatives at EU level should be systematically taken into account where relevant. In addition, efforts should be made to ensure synergies and complementarity with other EDF categories of actions, notably with advanced passive and active sensors, cyber, space, digital transformation and materials and components, in order to address, in a timely manner, cross-cutting technologies relevant for information superiority.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to discussions on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Information superiority* category of actions should be to support the achievement of the following main expected outcomes:

- Prototype of a European C2 software suite (contributing to an EU operational headquarter)
- Joint procurement of a special operations forces' command post and C2
- EU certified and combat-proven standards for tactical communications and radio interoperability
- MALE (medium altitude long endurance) RPAS (remotely piloted aircraft system) prototype, leading to joint procurement
- HAPS (high altitude platform systems) prototype, leading to joint procurement
- Tactical RPAS prototype, leading to joint procurement
- Detect and avoid capabilities for extensive integration in platforms

### **2.3. Advanced passive and active sensors**

This category of actions addresses mainly optronics and radar systems, including networked sensing systems, but also a broad range of passive sensing technologies and capabilities. This category embraces a very large spectrum of capacities and technologies that could be considered during the preparation of the successive annual work programmes.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Advanced passive and active sensors* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Concepts and prototypes of interoperable multi-sensor systems
- Consolidated supply chain for optronic detectors and radars
- Technological leap in the field of cognitive (adaptable) systems with a focus on radiofrequency (RF)

### **2.4. Cyber**

More investments for cyber R&D are necessary for increased resilience, improved cybersecurity and cyber defence capabilities. Identified vulnerabilities reveal a high EU dependency on third countries on cybersecurity and cyber defence technologies, which has a clear effect on EU's strategic autonomy. Incentivising cooperation in cybersecurity and cyber defence R&D is in line with EU's ambition to strengthen cyber resilience and capabilities building and is coherent with the "Fit for Digital Age" objectives and priorities set out in the Defence Package of February 2022. The EDF cyber category priorities and topics included in EDF WPs of 2021 and 2022 as well as the topics tentatively proposed for 2023 onwards address identified capability gaps and are coherent with the Capability Development Plan (CDP) Priorities ("*Enabling Capabilities for Cyber Responsive Operations*").

In view of increasing cyber defence capabilities, R&D for improved cyber situational awareness and strengthening cyber operational capabilities are needed, including cyber training and exercises platforms for interoperability. Special attention will be given to research actions and projects

addressing new technologies developed against emerging and evolving threats as well as increasing resilience, cybersecurity and defence.

Synergies with other research programmes will be taken into account in order to avoid unnecessary duplication of efforts and to allow an efficient uptake of results.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Cyber* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Creation of two persistent main lines of collaborative actions contributing to the development of European common and/or interoperable tools for:
  - cyber operations and incident management
  - information warfare defensive operations and preventive measures
- Resilience for cyber physical systems

## 2.5. Space

Military operations rely heavily on space-based data and space-enabled capabilities, including dual-use ones. Space capabilities can provide fast, globally available (including in space itself), continuous and discreet services for situational awareness, in support to decision making and conduct of military operations, as well as for the assessment of their specific results. Military applications and use cases require space capabilities to provide secure, robust, reliable and highly performant services in an evolving threat environment. In the context of the EDF, joint R&D actions in the space domain will target consolidation of the demand of capabilities, access to more performant services (e.g., broader bandwidth, increased area-access, continuity of services, higher reactivity and resilience) and improved interoperability while contributing to the reinforcement of the strategic autonomy of the Union. The EDF Programme Committee has currently indicated the level of ambition in terms of EDF contribution to Space to more than 10% of the total EDF budget.

In line with the Action Plan on Synergies between civil, defence and space industries<sup>2</sup>, possible synergies with other initiatives at EU level (e.g., Space programme, Horizon Europe) should be taken into account where relevant.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Space* category of actions should be to support the achievement of the following main expected outcomes:

- Joint procurement for integration of PRS (public regulated service) receivers into EU MSs military systems (autonomy/synergy Space/Defence)
- Joint procurement of SSA (space situational awareness) capabilities interfaced with EU SST (space surveillance and tracking)
- Space-based early warning prototype
- Space-based ISR (information, surveillance and reconnaissance) constellation prototype
- Potential synergies with the envisioned space connectivity constellation, subject to further analysis

<sup>2</sup> COM(2021) 70 Final, dated 22 February 2021

[https://ec.europa.eu/info/sites/info/files/action\\_plan\\_on\\_synergies\\_en.pdf](https://ec.europa.eu/info/sites/info/files/action_plan_on_synergies_en.pdf).

## 2.6. Digital transformation

The aim of this category of actions is to create and develop core artificial intelligence (AI) technologies for computer-aided decision-making, human-system cooperation, robotics and autonomous systems, and to support the underlying defence big data and cloud technologies.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Digital transformation* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Military operational cloud systems
- Shared databases for training, testing and certification of AI systems, and the associated environment to produce, curate and distribute them
- Energy-efficient, trustworthy and adaptive AI core technologies for integration into defence systems

## 2.7. Energy resilience and environmental transition

The aim of this category of action is to create and develop energy efficient solutions and green technologies in the defence sector. In the context of the current planetary crisis (climate change, biodiversity loss and pollution, natural resources depletion), the overall contribution of this category will support Europe in achieving ambitious environmental objectives. The European Green Deal with its strong focus on climate neutrality has become one of the top EU's priorities that should be reflected in all EU policies and programmes. The ecological transition will reshape geopolitics, including global economic, trade and security interests. In addition, it should be recognised that the global climate and environmental challenges are significant threat multipliers and sources of instability. These challenges can become sources of conflict, food insecurity, population displacement and forced migration. State and non-state actors compete for access to the scarce resources (*e.g.*, critical raw materials but also water and arable land), which can lead to crises and conflicts. Some of them will affect the EU and require a common response.

In March 2020, the EU adopted a new Circular Economy Action Plan (CEAP) - one of the main initiatives under the European Green Deal, Europe's new agenda for sustainable growth. The Commission stated in the CEAP that "*circularity is an essential part of a wider transformation of industry towards climate-neutrality and long-term competitiveness. It can deliver substantial material savings throughout value chains and production processes, generate extra value and unlock economic opportunities. Despite efforts at EU and national level, the amount of waste generated is not going down*". The defence activities need to contribute to the reduction of waste by developing innovative technologies to address *e.g.*, waste management, safe use of chemicals, component tracing, environmental protection, water management, and green military components, through design, maintenance, repair, reuse, remanufacturing, refurbishing and recycling.

Water is an increasingly scarce commodity and often imposes a substantial logistic burden on remote operations. Cheaper, high-throughput and ruggedised treatment technologies for water from a variety of sources, but also advanced packaging and preservation technologies are important.

In parallel, energy security is fundamental for any military activity. Movement, endurance and ability to perform any kind of operation depends on the availability of energy supply. Increasing demand of energy for modern capabilities requires an easy access, efficient storage and sustainable usage across

all military domains. Climate change prompts a move towards sustainable power sources beyond fossil fuels, generates challenges and threats impacting the way our forces operate, driving the capability requirement and ultimately influencing defence research and development.

Since military forces activities are energy-intensive, security of supply is critical. For forward forces deployed to operations and missions in harsh environmental conditions, technologies reducing the dependency on large supplies and minimize fuel transportation, thus limiting logistic footprint and operational vulnerabilities, will be needed. This translates into higher level of manoeuvrability, independence and therefore of effectiveness of the deployed forces. New developments should focus therefore on high density/high power storage system (e.g., customised batteries, fuel cells, multi-sources energy systems), as well as on modern energy conversion technologies and alternative propulsion (air, ground and sea) on existing and future platforms will hinge on the ability to downscale its energy sources and render them more efficient.

The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to Energy resilience and environmental transition to more than 5% of the total EDF budget.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Energy resilience and environmental transition* category of actions should be to support the achievement of the following main expected outcomes:

- Prototype of future green, efficient, resilient, safe and multi-sources, energy solutions for the defence sector operating under harsh environmental conditions
- Demonstrator of efficient and green engines representative of new architecture and technologies, respectively adapted to each of the following capability:
  - o next generation air combat aircraft
  - o next generation Main Battle Tank (MBT)
  - o next generation naval vessels
- Prototype of a technological solution to ensure save reuse of water for military and peace keeping missions
- Prototype of green innovative solution for recycling soldier equipment

## **2.8. Materials and components**

Materials and components are enablers for a large spectrum of products and capacities. There is strong interlinkage of this category with other categories of action of the EDF. Topics to be addressed are also linked to progress made in joint projects funded under the PADR<sup>3</sup>, EDIDP<sup>4</sup> and the European Defence Agency's projects.

Synergies with other research programmes, and in particular the Space Programme and Horizon Europe's funding for materials and electronic components will need to be considered to avoid unnecessary duplication of efforts and the efficient uptake of results. The uptake of R&D efforts originating from civil research should therefore be particularly promoted in this category of action. This could be realized in the form of follow-up funding for add-on R&D addressing the specific requirements for defence applications.

<sup>3</sup> Preparatory action on defence research

<sup>4</sup> European defence industry development programme



**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Material and components* category of actions should be to support enabling technologies and capabilities for a variety of defence applications and thereby supporting all other categories of actions, in particular by contributing to:

- Support of supply chains for electronic components
- Support of innovation for high-performance and protective materials
- Certification of technologies for manufacturing and maintenance

## **2.9. Air combat**

The category of action ‘Air combat’ consists of the development and the effective integration of air combat systems and technologies in overarching systems that allow data exchange and sensors networking in order to operate in more and more complex air environments. All these capabilities would operate in the future through a combination of manned and unmanned platforms, possibly integrated in larger joint operational contexts, with a collaborative combat approach. The category of action includes a broad range of high-end capabilities, manned or unmanned, from vectors to effectors, including dedicated weapon systems and payloads. In particular, next generation fighters and helicopters systems and technologies, including cutting-edge self-protection capabilities, are critical to achieving the desired air supremacy and penetration mission requirements. According to the collaborative warfare concept that will drive near future operations, all these air combat systems should be interoperable and interconnected in a large perimeter with different generations of various aircraft, satellites, naval and ground assets, and also compliant with NATO, EU and national regulations, standards and architectures when appropriate. These capabilities require long development cycles and heavy investments. The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to Air combat to more than 10% of the total EDF budget.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Air combat* category of actions should be to support the achievement of the following main expected outcomes:

- Critical components and technologies for next generation fighter systems
- EU standards for collaborative air combat
- Prototype of next generation rotorcraft, leading to joint procurement
- Joint procurement of an airborne electronic warfare capability

## **2.10. Air and missile defence**

The ‘Air and missile defence’ category embraces a large spectrum of capabilities ensuring the protection of the armed forces and population against aerial threats, from UAS to ballistic missiles. Both of those areas are critical for defence since commercial off-the-shelves drones are becoming more and more easy to buy and use, including for aggressive purposes, and the threat stemming from hyper velocity vehicles, including ballistic missiles, is also persisting. The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to Air and missile defence to more than 5% of the total EDF budget.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Air and missile defence* category of actions should be to support the achievement of the following main expected outcomes:

- Prototype of endo-atmospheric interceptor
- Prototype of counter UAS, leading to joint procurement

## **2.11. Ground combat**

Land platforms and their weapons systems are crucial capabilities for all land operations. This category focusses on major land combat systems (e.g., MBT<sup>5</sup>, ATV<sup>6</sup>, APC<sup>7</sup>), unmanned ground systems (UGS) and indirect fire while ensuring collaborative combat for European land forces.

The European capability landscape displays a lack of coherence through the high number of different types of land combat systems, including the diverging logistic systems behind, their status of modernisation and upgrade. This is reinforced by diverging approaches of Member States to prepare for the future as regards land platforms: digitalisation and systems-of-systems approach versus increase in numbers of combat systems. Reducing the diversity of types of land platforms and converging approaches to prepare the future will be the major challenge across all planning horizons. Against this background, Member States should cooperate on developing and refining generic open architectures standards in collaboration with the defence industry, while also developing modular and open platforms that can be easily upgraded and reconfigured in light of technological evolutions.

The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to Ground combat to more than 10% of the total EDF budget.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Ground combat* category of actions should be to support the achievement of the following main expected outcomes:

- Joint development and procurement of a different set of vehicles and integration of technologies for vehicles upgrades
- Contribution to future MBT and other armoured vehicles development
- BLOS (Beyond the line-of-sight) capability jointly procured
- Development of a long-range indirect fire demonstrator
- Unmanned ground systems jointly developed and ready to procure
- Contribution to enhanced connectivity and interaction among land platforms (manned/unmanned, mounted/dismounted) and initial integration of collaborative land combat capabilities into national platforms

## **2.12. Force protection and mobility**

Force protection and mobility at all levels minimises losses to hostile action while ensuring security of supply for the forces on the battlefield. The availability of capabilities to ensure advanced protection of forces and mobility is an important operational requirement.

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<sup>5</sup> Main battle tank  
<sup>6</sup> All-terrain vehicle  
<sup>7</sup> Armoured personnel carrier

Force protection and mobility encompasses a broad range of aspects, from design parameters of major combat platforms to individual soldier systems. The European capability landscape is characterised by a variety of standards and systems.

Preserving the overview on the needs and activities for force protection and mobility , including the cutting edge of technologies usable in this context, remains a major challenge across all planning horizons.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Force protection and mobility* category of actions should be to support the achievement of the following main expected outcomes:

- Standardisation of European soldier systems and systems jointly procured (e.g., equipment, interconnection)
- Contribution to improvement of soldiers' situational awareness, decision-making, effective engagement, operation in Global Navigation Satellite System (GNSS) denied environments, and teaming with unmanned systems through enhanced Soldier Systems.
- Contribution to a future medium size tactical cargo aircraft development

### **2.13. Naval combat**

The EU is surrounded by oceans and seas, which are essential for the European economy. The EU Maritime Security Strategy identifies a vast spectrum of challenges, threats and risks that could condition an open, safe and secure global maritime domain. Naval power and supremacy at sea is crucial for the European armed forces to fulfil their missions and to defend European citizens and territory as well as to enable power projection in more remote geographical areas. It has also a key role in peace and crisis times to support a credible foreign policy.

Evolving operational environment and threats require the development of cutting-edge maritime systems and platforms, which should be able to operate interconnected in a fully integrated way, under challenging multi-domain threat conditions (land, aerial, surface, subsurface and cyber), including, where necessary, in extreme climates and geographical environments (*e.g.*, the Arctic), as well as to comply with the requirements of most advanced environmental legislation.

From a technological and industrial perspective, despite the fragmentation of the naval EU internal market, the European naval industry remains competitive at global level and could maintain its technological leadership. Therefore, the capacities of system integrators and equipment suppliers represent a strategic asset of the European naval sector to be preserved and strengthened. The EDF Programme Committee has indicated the level of ambition in terms of EDF budget contribution to Naval combat and underwater warfare to more than 10% of the total EDF budget.

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Naval combat* category of actions should be to support the achievement of the following main expected outcomes:

- Joint procurement of a modular and multirole patrol corvette class
- First ship of a medium-size semi-autonomous surface vessel class, including different mission modules, leading to joint procurement of the class and including the development of standards related to automation
- Joint procurement and integration in different platforms of a naval collaborative surveillance capability.
- Development activities leading to a naval collaborative engagement capability
- Development of standards related to smart ships and digital transformation

## **2.14. Underwater warfare**

Underwater warfare remains an essential element of current and future operational plans of European navies. The capability to counter underwater threats is a fundamental enabler of securing freedom of action. This includes the need for capabilities ranging from anti-submarine effectors to mine countermeasures and their enablers, namely communication and surveillance. The future of underwater warfare is subject to the general megatrends of digitalisation and convergence. The dominant lines of evolution, which go beyond the current development programmes, concern issues such as swarm technologies with autonomous features operating in several environments where the same system can perform multiple tasks. Future sensors are foreseen to perform intelligence gathering, communication, analysis, positioning and engagement tasks. Actions addressing solutions to the general underwater challenge, namely the exchange of broadband information in real time, would address the needs of the broader domain. It is therefore essential to consider the underwater environment together with its interfaces from air to seabed, but also its specific threats and enabling infrastructure.

Actions under the EDF should target enabling technologies for future effectors, their countermeasures and their support functions. These actions could include next generation mine hunting solutions, detection of underwater threats, and agile multipurpose effectors with a focus on innovation. Digital infrastructure, net or data-centricity for integrated above and below surface communications and cyber security-by-design for both systems of robots and drones as well as platforms with realistic simulations of cyber-attacks scenarios for robotised mine warfare systems and solutions to face cyber threats should also be considered. Such actions will contribute to European strategic autonomy and substantially support the competitiveness of European industry, in particular at international level (through export of sea-proven and operationally proven solutions).

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Underwater warfare* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Prototype of a semi-autonomous modular mine-countermeasures suite
- Prototype of an unmanned anti-submarine warfare solution.
- Development of an advanced underwater observation and communication system for long ranges
- Development of swarm systems for multiple mission types

## 2.15. Simulation and training

Two main lines of work are considered for the EDF 2021-2027 in the simulation and training category of action:

- The existence of various isolated simulation systems in MS and the need to interact with systems from other MS.
- The technological trend and investments for simulation, virtual reality augmented systems and investments in metaverse worlds.

### **Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Simulation and training* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Foster innovation and cooperation for stakeholders in the defence modelling and simulation (M&S) domain.
- Create an ecosystem in simulation
- Prepare and align the technical solutions to facilitate joint procurements

## 2.16. Disruptive technologies

The EDF Regulation states that the Fund should support actions that are conducive to developing “disruptive technologies for defence”. Nevertheless, the EDF Regulation also mentions that as disruptive technologies can be based on concepts or ideas originating from “non-traditional” defence actors, the Fund should allow for sufficient flexibility regarding the consultation of stakeholders and the carrying out such actions.

Broadly speaking, “disruptive technology for defence” means an enhanced or completely new technology that brings about a radical change, including a paradigm shift in the concept and conduct of defence affairs such as by replacing existing defence technologies or rendering them obsolete<sup>8</sup>. Looking at the “non-traditional defence’s state-of-art” disruptive technologies encompass mainly the following fields: Artificial intelligence (AI), big data, the internet of things (IoT), autonomous systems (AS), biotechnologies and quantum technologies<sup>9</sup>.

Applied to the defence operational domains, the impact of these emerging technologies could be extensive and could also contribute to closing some military capability gaps.

In this perspective and in accordance with the EDF Regulation provisions stating that between 4-8% of the EDF budget shall be dedicated to disruptive technologies, it is intended to have at least two thematic disruptive topics addressed every year.

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<sup>9</sup> Cf. [NATO - Topic: Emerging and disruptive technologies](#)

**Main expected outcomes from EDF 2021-2027 support:**

Without prejudice to the discussion on other potential R&D topics to be addressed in future annual work programmes, the EDF ambition in the *Disruptive technologies* category of actions should be to support the achievement of the following main expected outcomes (complementary to the outcomes of other categories of actions in the full spectrum of defence domains):

- Demonstrator of a medium calibre electromagnetic artillery system (contributing to long range indirect fire capabilities' development)
- Other disruptive technologies, including quantum, metamaterials and AI techniques for defence applications