



Brussels, 29.3.2023
C(2023) 2296 final

COMMISSION IMPLEMENTING DECISION

of 29.3.2023

on the financing of the European Defence Fund established by Regulation (EU) No 2021/697 of the European Parliament and the Council and the adoption of the work programme for 2023 - Part II

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, hereafter referred to as the ‘TFEU’,

Having regard to Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012¹, hereafter referred to as the ‘Financial Regulation’, and in particular Article 110 thereof,

Having regard to Regulation (EU) No 2021/697 of the European Parliament and of the Council of 29 April 2021 establishing the European Defence Fund and repealing Regulation (EU) No 2018/1092², hereafter referred to as the ‘EDF Regulation’, and in particular Article 24 thereof,

Whereas:

- (1) In order to ensure the implementation of the European Defence Fund for the year 2023, it is necessary to adopt a financing decision, which constitutes the annual work programme for 2023. Article 110 of the Financial Regulation establishes detailed rules on financing decisions.
- (2) The envisaged assistance is to comply with the conditions and procedures set out by the restrictive measures adopted pursuant to Article 215 of the TFEU.
- (3) Pursuant to Article 62(1)(c) of the Financial Regulation, indirect management is to be used for the implementation of the programme.
- (4) The Commission is to ensure a level of protection of the financial interests of the Union with regards to entities and persons entrusted with the implementation of Union funds by indirect management as provided for in Article 154(3) of the Financial Regulation. To that end, such entities and persons are to be subject to an assessment of their systems and procedures in accordance with Article 154(4) of the Financial Regulation and, if necessary, to appropriate supervisory measures in accordance with Article 154(5) of the Financial Regulation before a contribution agreement can be signed.
- (5) It is appropriate to authorise the award of grants without a call for proposals and to provide for the conditions for awarding those grants.

¹ OJ L 193, 30.7.2018, p.1

² OJ L 170, 12.5.2021, p.149

- (6) It is necessary to allow for the payment of interest due for late payment on the basis of Article 116(5) of the Financial Regulation.
- (7) In order to allow for flexibility in the implementation of the work programme, it is appropriate to determine the changes, which should not be considered substantial for the purposes of Article 110(5) of the Financial Regulation.
- (8) The measures provided for in this Decision are in accordance with the opinion of the EDF Programme Committee, established by Article 34 of EDF Regulation.

HAS DECIDED AS FOLLOWS:

Article 1
The work programme

The annual financing decision, constituting the annual work programme for the implementation of the European Defence Fund for 2023 – Part II, as set out in the Annex 1 and further elaborated in the two subsequent annexes, is hereby adopted.

Article 2
Union contribution

The maximum Union contribution for the implementation of the programme for 2023 – Part II is set at EUR 789 070 981, and shall be financed from the appropriations entered in the following lines of the general budget of the Union:

- (a) budget line 13.0201 - Capability development: EUR 511 940 000;
- (b) budget line 13.0301 - Defence research: EUR 277 130 981;

The appropriations provided for in the first paragraph may also cover interest due for late payment.

Article 3
Methods of implementation and entrusted entities or persons

The implementation of the actions carried out by way of indirect management, as set out in the Annex 1, may be entrusted to the entities or persons referred to or selected in accordance with the criteria laid down in that Annex 1.

Article 4
Flexibility clause

Cumulated changes to the allocations to specific actions not exceeding 20% of the maximum Union contribution set in the first paragraph of Article 2 of this Decision shall not be considered to be substantial for the purposes of Article 110(5) of the Financial Regulation, where those changes do not significantly affect the nature of the actions and the objective of the work programme.

The authorising officer responsible may apply the changes referred to in the first paragraph. Those changes shall be applied in accordance with the principles of sound financial management and proportionality.

Article 5
Grants

Grants may be awarded without a call for proposals in accordance with the conditions set out in the Annex 1.

Article 6
Financial instruments

An amount of EUR 20 000 000 from the European Defence Fund in 2023 shall be allocated to actions under blending operations as set out in Annex 1.

Blending operations shall be implemented under indirect management by the European Investment Fund.

Done at Brussels, 29.3.2023

For the Commission
Thierry BRETON
Member of the Commission



Brussels, 29.3.2023
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ANNEX 1

ANNEX

to the

Commission Implementing Decision

on the financing of the European Defence Fund established by Regulation (EU) No 2021/697 of the European Parliament and the Council and the adoption of the work programme for 2023 - Part II

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1. INTRODUCTION

The European Union (EU) is faced with increasing geopolitical instability and a complex set of conventional and new threats while the defence sector is fragmented and lacks investments in important research and capability development projects. Therefore, the EU is taking steps to bear more responsibility for its security and defence, including in its neighbourhood, to contribute to its strategic autonomy and freedom of action, and to assist in creating a more competitive and integrated European defence technological and industrial base, thus reducing its dependencies. Following the Preparatory Action on Defence Research (PADR) and the European Defence Industrial Development Programme (EDIDP), the European Defence Fund (EDF) has been created to foster competitiveness, efficiency and innovation capacity of the defence technological and industrial base throughout the EU. It should complement, leverage, and consolidate collaborative efforts and cross-border cooperation between legal entities in developing defence capabilities that respond to security challenges while strengthening and improving the agility of both defence supply and value chains. The defence capability needs and shortfalls remain significant throughout the EU, in particular regarding next generations of large-scale capabilities, but also in critical cross-cutting and enabling areas such as space, including making best use of existing EU/European space systems by contributing to the development of their military applications, and cyber. The EDF should also foster better exploitation of the industrial potential of innovation, research and technological development at each stage of the industrial life cycle of defence products and technologies, including through cross-fertilisation with civilian innovations in various domains such as digital, artificial intelligence and cyber.

In addition, the ecological transition is likely to reshape geopolitics, including global economic, trade and security interests. State and non-state actors compete for the access to the scarce resources (e.g., critical raw materials). This affects the EU and requires a common response in order to avoid crises and conflicts. In this context, the EU has adopted a new Circular Economy Action Plan (CEAP) as one of the main blocks of the European Green Deal, EU's new agenda for sustainable growth. CEAP can deliver substantial material savings throughout value chains and production processes, generate extra value and unlock economic opportunities. Therefore, defence activities, notably those supported by the EDF, need to address, wherever relevant, the reduction of waste by developing and integrating innovative technologies (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.

The EDF is implemented through annual work programmes from 2021 to 2027. Priorities identified in the annual work programmes are in line with the EU capability priorities commonly agreed by Member States, in particular through the Capability Development Plan (CDP)¹. Due consideration has been given to legacy PADR and EDIDP work programmes, to existing proposals from the Permanent Structured Cooperation (PESCO) framework and to the Common Security and Defence Policy (CSDP) capability shortfalls.

This work programme sets out in detail the actions to be financially supported by the Fund in the year 2023 (see table below) through calls for proposals.

¹ The purpose of CDP is to increase coherence between Member States' defence planning and to encourage European cooperation by looking at future operational needs and defining common Capability Development Priorities. The latest version of CDP was endorsed by the European Defence Agency (EDA) Steering Board in Capability Directors formation in June 2018.

- The work programme identifies 16 thematic *categories of actions*, among which research and development topics are identified, where appropriate.
- The contribution of each *category of actions* to the three *fields* defined in the EDF Regulation² is also indicated.

EDF thematic <i>categories of actions</i>	Fields covered		
	(a)	(b)	(c)
1. Defence medical response, Chemical Biological Radiological Nuclear (CBRN), biotech and human factors	X		
2. Information superiority		X	
3. Advanced passive and active sensors	X	X	
4. Cyber		X	
5. Space		X	
6. Digital transformation	X	X	
7. Energy resilience and environmental transition	X		
8. Materials and components	X	X	X
9. Air combat	X		X
10. Air and missile defence	X	X	X
11. Ground combat	X	X	X
12. Force protection and mobility	X	X	
13. Naval combat	X	X	X
14. Underwater warfare	X	X	
15. Simulation and training	X		
16. Disruptive technologies	X	X	X

In addition to the calls for proposals addressing these thematic *categories of actions*, there are:

- Non-thematic calls for proposals focused on SMEs targeting research and development actions, to foster innovation as a key objective of the EDF.
- Calls for proposals targeting other types of actions.

Each *category of actions* may be addressed through one or more *calls for proposals*, as described in Appendix 1. The list of *calls for proposals* and associated *topics* addressed in this annual work programme is defined in section 1.

Each *topic* targets one or more *activities*, in accordance with Article 10(3) of the EDF Regulation. The table below indicates which *activities* are eligible for research actions and for development actions. A given topic can focus more specifically on one or more mandatory *activities* but can allow additional optional *activities* that would lead to (“*upstream activities*”) or result from (“*downstream activities*”) these *activities*.

² Pursuant to article 24(3) the research topics and categories of actions shall cover products and technologies in the fields of:

- preparation, protection, deployment and sustainability;
- information management and superiority and command, control, communication, computers, intelligence, surveillance and reconnaissance (C4ISR), cyber defence and cybersecurity; and
- engagement and effectors.

Types of activities		Short name	Coverage	
			Research action	Development action
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies for defence, which can achieve significant effects in the area of defence	Generating knowledge	Eligible	Not eligible
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies	Integrating knowledge	Eligible	Eligible
(c)	Studies, such as feasibility studies, to explore the feasibility of new or upgraded products, technologies, processes, services and solution	Studies	Eligible	Eligible
(d)	The design of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial tests for risk reduction in an industrial or representative environment	Design	Eligible	Eligible
(e)	The system prototyping of a defence product, tangible or intangible component or technology	System prototyping	Not eligible	Eligible
(f)	The testing of a defence product, tangible or intangible component or technology	Testing	Not eligible	Eligible
(g)	The qualification of a defence product, tangible or intangible component or technology	Qualification	Not eligible	Eligible
(h)	The certification of a defence product, tangible or intangible component or technology	Certification	Not eligible	Eligible
(i)	The development of technologies or assets increasing efficiency across the life cycle of defence products and technologies	Increasing efficiency	Not eligible	Eligible

2. LEGAL BASIS

All actions that will be funded under this work programme have their legal basis in Regulation (EU) 2021/697 (EDF Regulation).

3. ACTIONS IMPLEMENTED UNDER THE WORK PROGRAMME IN 2023

This section lists the *calls for proposals* and their associated *topics*, together with their main characteristics. These *calls for proposals* and *topics* result from a discussion with the EDF Programme Committee composed of representatives from the Member States and EDF associated countries (Norway).

Management mode:

As per Article 8(1) of the EDF Regulation and unless otherwise provided for in the present work programme, the actions set out in this work programme shall be implemented in direct management by the Commission.

By way of derogation, in accordance with Article 8(2) of the EDF Regulation, specific actions may, in substantiated cases, be carried out under indirect management by bodies as referred to in point (c) of Article 62(1) of the Financial Regulation, for example in case of complex actions where a project manager has been appointed by Member States, taking into account in particular the complexity of the action and the experience of the proposed body.

The change of management mode set in the present work programme will be assessed after the selection of proposals retained for funding and be subject to the prior assessment of the bodies in accordance with Article 154 of the Financial Regulation in order to ensure the protection of the financial interest of the EU. The responsible Authorising Officer is authorised to conclude a contribution agreement with entities that have satisfactorily passed the prior assessment referred to in Article 154 of the Financial Regulation. If the terms of a contribution agreement cannot be successfully agreed with a pillar assessed entity in due time, the concerned project(s) may be managed in direct management by the Commission.

Calls for proposals:

Five calls for proposals will be launched in 2023, covering 15 out of the 16 thematic categories of actions, in addition to two calls for proposals not related to thematic categories of actions as set out in section 3.2:

1) EDF-2023-RA:

- **Targeted type of actions:** Research actions
- **Form of funding:** Actual costs grants following the call for proposals
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation
- **Indicative budget for the call:** EUR 130 000 000³ for 7 call topics addressing 5 categories of actions.

³ The budget earmarked on 2023 appropriations for this call may be complemented by an amount of up to EUR 27 000 000 from 2024 appropriations. This 2024 complementary budget is subject to the adoption of a separate financing decision.

2) EDF-2023-RA-SI:

- **Targeted type of actions:** Research actions
- **Form of funding:** Actual costs grants following the call for proposals
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation. The proposals need to build upon or integrate results that have been achieved within one or several projects that had been funded under an EU programme call with a focus on civil applications. This previous project(s) may be completed or may still be active. The submitting consortium does not need to be constituted or even to include a participant or result owner of the previous project(s). However, applicants must provide a confirmation that they have or will have the necessary rights to use and commercialise the results of the previous project(s).
- **Indicative budget for the call:** EUR 59 000 000 for 3 call topics addressing 3 categories of actions.

3) EDF-2023-LS-RA-DIS:

- **Targeted type of actions:** Research actions (dedicated to disruptive technologies for defence)
- **Form of funding:** Lump sum grants following the call for proposals
- **Targeted type of applicants:** Any consortium of eligible entities as defined in Article 9 of the EDF Regulation and involving at least two legal entities established in at least two different Member States or EDF associated countries (Norway). At least two of the eligible legal entities established in at least two Member States or EDF associated countries (Norway) shall not, during the entire period in which the action is carried out, be controlled, directly or indirectly, by the same legal entity, and shall not control each other.
- **Indicative budget for the call:** EUR 16 000 000 for one call topic addressing one category of actions

4) EDF-2023-LS-RA-CHALLENGE:

- **Targeted type of actions:** Research actions (technological challenge)
- **Form of funding:** Lump sum grants following the call for proposals
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation
- **Indicative budget for the call:** EUR 25 000 000 for 2 call topics addressing one category of actions

5) EDF-2023-DA:

- **Targeted type of actions:** Development actions
- **Form of funding:** Actual costs grants following the call for proposals
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation

- **Indicative budget for the call:** EUR 375 500 000⁴ for 17 topics addressing 11 categories of actions

3.1. Actions to be funded through grants and related to the categories of actions

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

This *category of actions* will be addressed through the implementation of the Framework Partnership Agreement related to a defence medical countermeasures Alliance (see second topic). In addition, this category will be addressed through one *call for proposals* in 2023, namely EDF-2023-DA with proposals called for the following topic:

3.1.1.1. EDF-2023-DA-MCBRN-FCS: Federating CBRN systems

Numerous developments in the international security environment require a collective response to a chemical, biological, radiological, or nuclear attack with reconnaissance, sampling, protection, decontamination and hazard management capabilities, among others. The threat is continuously evolving and imposes adaptation of existing technologies and development of new solutions in order to improve armed forces capabilities. Recent events (use of chemical warfare agents in Syria/Iraq, use of “Novichok” agents, raising nuclear threat) make necessary to put more effort on CBRN defence.

The aim of this development action is to develop a CBRN system at European scale with a system of systems approach and including modular kits.

Targeted types of activities: Studies, design and system prototyping, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 15 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.1.2. EDF-2023-RA-SGA-MCBRN-MCM: defence medical countermeasures Alliance

Within the Framework Partnership Agreement (FPA) following the call topic EDF-2022-FPA-MCBRN-MCM to establish and support EU defence medical countermeasures Alliance, the selected consortium will be invited to submit a proposal that will implement the first actions of the action plan defined in the above FPA.

The scope and targeted activities will be as defined in the FPA.

The standard EDF eligibility criteria, evaluation criteria, thresholds and weighting will apply according to the research nature of the action.

Type of action: Specific grant agreement awarded without call for proposals in relation to a Framework Partnership Agreement.

Indicative budget: EUR 1 300 000⁵ for this topic.

⁴ The budget earmarked on 2023 appropriations for this call may be complemented by an amount of up to EUR 339 000 000 from 2024 appropriations. This 2024 complementary budget is subject to the adoption of a separate financing decision.

3.1.2. Information superiority (C4ISR⁶)

This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-DA, and proposals will be called for each of the following three topics:

3.1.2.1. EDF-2023-DA-C4ISR-LCOM: Laser communications

An effective and robust EU military Intelligence, Surveillance, Target, Acquisition and Reconnaissance (ISTAR) capability for missions and operations is an essential element of the overall EU effort to facilitate international conflict prevention and crisis management during all phases of operation.

ISTAR operations use and generate a large amount of data (e.g., optical and infrared, radar, signal intelligence sensors, geoinformation), moreover close to real time. Therefore, there is a critical requirement for high bandwidth transmission and a laser communication between the ISTAR remotely piloted aircraft systems (RPAS), notably the medium altitude long endurance (MALE) RPAS, and space-based/ground segment terminals.

This topic aims to develop a prototype for airborne laser communication system to be used on various types of aircraft, manned or unmanned, notably the European MALE RPAS.

Targeted types of activities: Study, design, system prototyping and testing, not excluding upstream and downstream activities eligible for development actions

Indicative budget: EUR 17 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.2.2. EDF-2023-DA-C4ISR-TRPAS: Tactical RPAS

There is a persisting need for tracking of ships, aircraft and other equipment evolving within a continuous wide-area airspace, to be tackled notably through an interoperable unmanned surveillance system able to operate in all weather conditions, all types of environment (including denied) and with assured data integrity. Tactical RPAS systems and sensors are key elements to information collection and the timely delivery of the information obtained for use in the production of intelligence and situational awareness.

This topic aims to develop a multi-purpose/multi-role tactical RPAS able to collect tactical level intelligence with high-performance multi-sensor equipment, through ISR⁷ and targeting missions, in addition to other related tasks (target acquisition, identification, tracking).

This topic aims to complement activities requested under the call topic EDIDP-ISR-TRPAS-2019 on *development of a low-observable tactical RPAS with the capability to provide near real time information and with modern self-protection*.

Targeted types of activities: Studies, design, system prototyping, testing, qualification and certification, not excluding upstream and downstream activities eligible for development actions

⁵ The budget earmarked on 2023 appropriations for the implementation of the Framework Partnership Agreement may be complemented by an amount of up to EUR 23 700 000 from 2024 appropriations. This 2024 complementary budget is subject to the adoption of a separate financing decision.

⁶ Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

⁷ Intelligence, Surveillance and Reconnaissance

Indicative budget: EUR 42 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.2.3. EDF-2023-DA-C4ISR-DAA: Detect and avoid

Detect And Avoid (DAA) capabilities ensure remotely piloted aerial systems (RPAS) ability to integrate into non-segregated airspace and safely handle collision hazards with any other air vehicles in the sky, including with manned aircraft, as well as to interact with military and civil Air Traffic Management (ATM) systems, whenever required, including in view of integration of the envisioned European MALE RPAS.

This topic aims to provide a fully standardised, qualified and certifiable DAA solution for UAS⁸ in view of fully integrating RPAS in the general airspace without any limitations regarding operation in the airspace including in Traffic Monitoring and Analysis (TMA).

This topic aims to complement the activities requested under the call topic EDIDP-ISR-DAA-2019 on *European Detect and Avoid (DAA) function based on new sensors and processing for RPAS integration into air-traffic management*.

Targeted types of activities: Studies, design, system prototyping, testing and qualification, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 40 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.3. Advanced passive and active sensors (SENS)

This *category of actions* will be addressed through two *calls for proposals* in 2023, EDF-2023-RA and EDF-2023-DA, and proposals will be called for each of the following three topics:

3.1.3.1. EDF-2023-RA-SENS-EMSP: Electromagnetic signal propagation

The aim of this research topic on electromagnetic signal propagation is to enhance assessment and forecasting of radio-frequency sensor system performance, including anomalous propagation beyond line-of-sight distances. Objectives include improved performance for hypersonic glide vehicles and hypersonic cruise missiles detection, weapons-grade threat localisation and continuous tracking. The scope encompasses data gathering (observations), improvement of electromagnetic propagation models for real-time wavelength-dependent modelling, definition of a joint observation approach and standardisation. This topic will contribute to networked sensor performance as well as communication capabilities.

Targeted types of activities: Generating knowledge, integrating knowledge, studies and design

Indicative budget: EUR 22 000 000 for this topic under the call EDF-2023-RA.

⁸ Unmanned Aerial Systems

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.3.2. EDF-2023-RA-SENS-OPTD: Optronics detector technologies

The domain of optronic detectors encompasses a variety of technologies that work in different spectral bands for a variety of applications (land, air, naval, space, missile guidance, drones...). The risk is high that the EU becomes severely dependant on suppliers established in third country for this critical defence technology in the medium and long term. This topic addresses technologies contributing to an EU supply chain that is not subject to restrictions for Type-II-Superlattice infrared sensors, namely: supply chain technologies for infrared detectors (such as substrate preparation and epitaxy), read-out-integrated-circuit (ROIC) technology and components for coolers. Aspects on ROIC technology should complement the call EDF-2021-SENS-R-IRD, which focussed on the read-out circuit for infrared components.

Targeted types of activities: Integrating knowledge, not excluding upstream and downstream activities eligible for research actions.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.3.3. EDF-2023-DA-SENS-GRID: Sensor grid

This topic aims to set up a European sensor grid architecture framework in order to connect various European assets in a real-time network. The network should be able to detect targets like ballistic missiles, hypersonic glide vehicles and hypersonic cruise missiles and thereby to support integrated air & missile defence operations (IAMD). The network should be focussed on radar sensors and should have the ability to include and combine different sensors such as ground based and airlifted, passive and active, stationary and mobile sensors. The scope of the topic encompasses concepts, architectures and a proof-of-concept demonstration, complemented by aspects of resource management and adaptability of the network to operational conditions.

Targeted types of activities: Integrating knowledge, studies, design, system prototyping and testing, not excluding downstream activities eligible for development actions

Indicative budget: EUR 27 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.4. Cyber (CYBER)

There is an increasing collective requirement to strengthen the EU resilience to emerging, growing and evolving cyber threats worldwide. In particular, while recognised as a military operational domain as such, cyber is an integrant and crucial dimension of key defence capabilities. The field of cybersecurity and cyber defence has become one of the priorities at EU level. R&D actions for cybersecurity and cyber defence in the context of the EDF will strengthen cyber resilience and improve cooperation, coordination and joint capability building, hence leveraging interoperability and military operations efficiency. Against this

background, cyber situational awareness and operational capacity building actions, including joint research actions for cyber domain, are foreseen. The research topics are targeting actions which are necessary to achieve the strategic goals set in the cyber category. Based on the fast-growing and novel cyber threats, improved efficiency and increased use of novel technologies in cyber defence is addressed.

This *category of actions* will be addressed through two *calls for proposals* in 2023, EDF-2023-RA-SI and EDF-2023-DA, and proposals will be called for each of the following three topics:

3.1.4.1. EDF-2023-RA-SI-CYBER-ASPT: Automation of security penetration tests

Cybersecurity and cyber defence performance are affected by the vulnerabilities caused by increasingly advanced and skilled actors in the Cyber domain. Automating security penetration tests may increase efficiency against these threats, but it involves several challenges.

In order to best complement R&D efforts already targeting civil applications and in order to encourage the efficient spinning-in of knowledge and innovative solutions to the defence sector, this research topic aims to overcome obstacles associated to the automation of penetration tests, and at least partially automate the process by developing a user-friendly software solution that performs network security penetration tests for cyber defence actors.

In order to best complement R&D efforts already targeting civil applications and to encourage the efficient spinning-in of knowledge and innovative solutions to the defence sector, this topic will provide funding for add-on research to adapt solutions originally developed for civil applications to defence requirements. It targets proposals that drive forward or integrate results of projects funded under EU programme calls with a focus on civil applications and under the provision that the applicants have the necessary rights to access and commercialise the results of the precursor project.

Targeted types of activities: Generating and integrating knowledge, studies and design.

The proposals need to build upon or integrate results that have been achieved within one or several projects funded under a EU programme call with a focus on civil applications and for which applicants will have the necessary rights to use and commercialise the results.

Indicative budget: EUR 14 000 000 for this topic under the call EDF-2023-RA-SI.

Indicative number of proposals to be funded: Several proposals may be funded for this topic

3.1.4.2. EDF-2023-DA-CYBER-CSA: Cyber situational awareness

Cyber Situational Awareness (CySA) in the context of active cyberspace describes the capability of perceiving, reasoning and projecting knowledge of the elements in the battlespace. Therefore, CySA is necessary to make well-informed decisions by putting emphasis on the cyber situations and their propagations to planned missions. Commanders need to acquire CySA at strategic, operational and tactical levels in order to make informed decisions on how to operate in cyberspace towards enhancing mission assurance and to achieve cyber-effects to support mission objectives. Previous national and EU initiatives have addressed the conceptualisation and development of technologies for the acquisition of situational awareness by focusing on the logical sub-layer of cyberspace (software, services,

networks, interfaces, etc.) but there is an increasing demand for military focused solutions able to holistically understand the cyberspace taking into account all the layers.

This topic aims at improving cyber situational awareness by developing mission-centric CySA capabilities able to assist human decision-makers, which contribute to developing further a European operational platform and enhances cyberspace operations capabilities. It aims to form the basis of a future interoperable real time CySA for defence purposes, hence complementing activities requested under the call EDIDP-CSAMN-2019 on *Cyber situational awareness and defence capabilities, military networks and technologies for secure communication and information sharing*, and under the call EDF-2021-RA-CYBER-CDAI on *Improving cyber defence and incident management with artificial intelligence*.

Targeted types of activities: Studies, design and prototyping, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.4.3. EDF-2023-DA-CYBER-DAAI: Deployable autonomous AI Agent

The threat of misuse of Artificial Intelligence (AI)-technology, which makes broad-scale attacks a lot easier, poses a serious threat to EU Member States. While the threat of mass cyber-attacks has become a reality since the Russian unprovoked aggression against Ukraine, the use of AI technology to manage mass cyber-attacks has drastically increased. There is an urgent need to develop new EU solutions in order to combat increasing threats in this field, while ensuring resilience, cybersecurity and enhance cyber operations capabilities.

This topic aims at promoting defence measures against AI-based cyber-attacks by developing an autonomous deployable AI agent. The AI agent should be able to conduct automated and semi-automated incident management on different cyber defence systems for the entire process of the incident management cycle. The solution should support human operators, analysts and decision-makers at all levels (technical, tactical, operational, strategic and political level). In addition, solutions are expected to contribute to enhanced cyber situational awareness, increased military infrastructure resilience and improved protection against AI-based and other advanced cyber threats.

This topic aims to complement activities requested under the call EDF-2021-RA-CYBER-CDAI on *Improving cyber defence and incident management with AI*.

Targeted types of activities: Studies, design, system prototyping and testing, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 26 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.5. Space (SPACE)

The EU is funding and running the space flagships Galileo and Copernicus and is further developing new initiatives (EU-SST, GOVSATCOM, Secure connectivity), all being of dual-

use interest. At the same time, the commercial sector is blooming with a growing number of projects from both established actors and incomers proposing disruptive concepts and services (e.g., constellations of small satellites) whose potential for defence applications is not fully explored yet. Military operations rely heavily on space-based or space-enabled capabilities, including dual-use ones. Space capabilities provide fast, continuous and discreet services for situational awareness worldwide (including in Space itself), as well as support to decision making, to conduct of military operations and to the assessment of their specific results. In particular, military-class space capabilities have to provide secure, available and high-performance services in an evolving threat environment. In the context of the EDF, joint R&D actions in the space category will allow consolidation of the demand of capabilities, access to higher-performance services (e.g., increased bandwidth, increased areal-access, continuity of surveillance), increased interoperability while contributing to the development of a European Space culture and the reinforcement of the strategic autonomy of the EU.

This *category of actions* will be addressed through two *calls for proposals* in 2023, EDF-2023-RA and EDF-2023-DA, and proposals will be called for each of the following two topics:

3.1.5.1. EDF-2023-RA-SPACE-PSA: Threat surveillance and protection of space-based assets

Considering the increasing threats and hazards towards space-based capabilities, crosscutting functions and technologies should be developed for a better efficiency, safety and resilience of core missions such as space-based Earth observation, positioning navigation and timing, space situational awareness and missile early warning. One of these crosscutting functions should address resilience and passive protection of space assets, in particular local protection and ability to detect and identify threats.

The topic consists in consolidating the potential threats against space assets and technological solutions to address them, studying, selecting and further designing the most promising ones and developing the associated roadmap and technological building blocks. Such technologies should consider, among others, passive or active optical sensors, radar sensors, on-board processing, technologies for manoeuvres, and other protection solutions against identified threats including interference, directed-energy weapons and other physical attacks. The topic should also address the space system architecture and layout. This topic aims to complement activities requested under previous EDIDP calls (in particular EDIDP-SSAEW-SC2-2020 on *Advanced Space Command and Control (SC2) capability to process and exploit SSA data generated from sensors and catalogues to provide a complete space picture* and EDIDP-SSAEW-SSAS-2020 on *Enhanced SSA sensors for accurate identification and characterization of existing Geostationary Earth Orbit (GEO) and Low Earth Orbit (LEO) public and private assets*) and under EDF-2023-DA-SPACE-SSA topic.

Targeted types of activities: Generating knowledge, studies and design, not excluding other activities eligible for research actions.

Indicative budget: EUR 25 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic

3.1.5.2. EDF-2023-DA-SPACE-SSA: Initial operational capacity for Space situational awareness C2 and sensors

Space Situational Awareness (SSA) has become a key strategic and operational function to ensure access to space and for the provision of adequate support to space-enabled missions and operations. The development of an autonomous, sovereign EU military SSA capability enhancing and complementing the currently available Space Surveillance and Tracking capabilities in Europe is an enabler to ensure appropriate identification, characterisation and response to natural and man-made (including hostile) threats.

Taking into consideration the already existing initiatives in the domain, the proposed topic aims at further developing technologies and products improving military space situational awareness in Europe. It should target advanced development of components and system level technologies and products (including qualification for some parts) thus leading to a European military SSA initial operational capability. Such capability will be based on a network of national space surveillance capabilities leveraging enhanced ground- and space-based sensors and state-of-the-art command and control, data management and processing.

This topic aims to complement activities requested under previous EDIDP calls (in particular EDIDP-SSAEW-SC2-2020 on *Advanced Space Command and Control (SC2) capability to process and exploit SSA data generated from sensors and catalogues to provide a complete space picture* and EDIDP-SSAEW-SSAS-2020 on *Enhanced SSA sensors for accurate identification and characterization of existing Geostationary Earth Orbit (GEO) and Low Earth Orbit (LEO) public and private assets*) and under EDF-2023-RA-SPACE-PSA topic, as well as and those carried out under other EU programmes (e.g. EU-SST Framework), in order to avoid unnecessary duplication of funding.

Targeted types of activities: Studies, design, system prototyping, testing and qualification, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 100 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.6. Digital transformation (DIGIT)

Digital transformation, due to the production and use of ever larger amounts of data and the increasing involvement of artificial intelligence (AI) in defence systems and decision-making processes, is becoming critical for defence operations. While AI is a dual-use technology, defence application-driven R&D is essential to steer progress toward military needs and more generally to strengthen the innovation ecosystem.

This *category of actions* will be addressed through two *calls for proposals* in 2023, namely EDF-2023-RA and EDF-2023-LS-RA-CHALLENGE, and proposals will be called for each of the following three topics:

3.1.6.1. EDF-2023-RA-DIGIT-HAAI: Dedicated hardware architectures for energy-efficient AI

The energy consumption of Artificial Intelligence (AI) systems is becoming an increasingly important issue, especially for embedded systems. While general-purpose processors have the advantage of being versatile, they are far from optimal for AI applications in terms of

efficiency and energy consumption. Furthermore, while they have benefited from steady technological progress in term of miniaturisation and performance for decades following Moore's law and thus outpaced any potential alternative, this trend is reaching its limit. Dedicated hardware architectures therefore start to emerge as an alternative. In particular, analog computing (which can be based on classical electronics or on quantum technologies such as spintronics) has the potential to improve energy efficiency by several orders of magnitude. Furthermore, it can be combined with the increasing versatility of artificial neural networks to address a variety of AI applications. The gains expected from these new architectures will become essential for future high-end defence AI applications, and there is a need to upscale the current research efforts to address these applications. The goal of the topic is thus to create new processing architectures for AI that offer very significant gains in term of power consumption as well as of size, weight and cost.

Targeted types of activities: Study and design, not excluding upstream and downstream activities eligible for research actions.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals actions to be funded: Several proposals may be funded for this topic

3.1.6.2. EDF-2023-LS-RA-CHALLENGE-DIGIT-HLTP: Agile and robust human language technologies for defence – Participation to a technological challenge

With the digitalisation of the battlefield, which leads to more and more complex user interfaces and to ever increasing volumes of language data to process, language technologies such as multilingual written or spoken interaction, translation and information retrieval are needed in an increasing number of defence systems, especially for joint multinational operations and C4ISR. While existing technologies already offer useful services in some contexts, progress is still needed to meet the requirements of most military applications. Technologies should in particular improve in terms of robustness to noisy inputs, adaptability to new contexts, and robust processing of high-level semantic information. They should enable users to adapt systems on confidential data that cannot be shared with developers. Coverage in term of languages should also be extended to offer high performances on a wide range of languages, including the European ones but also languages for which limited data is available. The goal of the topic is both to advance the state-of-art in term of accuracy, to produce technological modules, and to integrate them in demonstrators.

These modules should be tested in a comparable and objective manner on data that is representative of defence use cases. For that purpose, each consortium supported through this call topic will benefit from a common testing environment set up in the framework of a technological challenge (supported through topic EDF-2023-LS-RA-CHALLENGE-DIGIT-HLTO) and will have to participate in the evaluation campaigns organised in this framework.

Targeted types of activities: Generating and integrating knowledge, not excluding downstream activities eligible for research actions.

Indicative budget: EUR 18 000 000 for this topic under the call EDF-2023-LS-RA-CHALLENGE.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

Range of financial contribution of the European Union per proposal: The requested funding should not exceed EUR 6 000 000.

3.1.6.3. EDF-2023-LS-RA-CHALLENGE-DIGIT-HLTO: Agile and robust human language technologies for defence – Organisation of a technological challenge

Progress in human language technologies rely on the availability of representative databases and on objective performance evaluation. One goal of the topic is to collect databases that are representative of military use cases and to evaluate systems developed to address these use cases. At least part of the data should be shared with the systems developers. Internal evaluation of technological modules on confidential data can also be conducted and feedback provided to developers without sharing the data.

Targeted types of activities: Integrating knowledge, not excluding upstream and downstream activities eligible for research actions.

Indicative budget: The EU is considering a contribution of up to EUR 7 000 000 for this topic under the call EDF-2023-LS-RA-CHALLENGE.

Indicative number of proposals to be funded: One proposal is to be funded for this topic.

3.1.7. Energy resilience and environmental transition (ENERENV)

As stated in the EDF Regulation, the EDF should contribute to the mainstreaming of climate actions in Union policies and to the achievement of an overall target of 30 % of the EU budget expenditure supporting climate objectives. The EDF Regulation also states that relevant actions will be identified during the EDF preparation and implementation. The Commission embarks on twin ecological and digital transitions, which are clear challenges in the field of energy and environmental transition when conducting defence affairs.

This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-RA-SI, and proposals will be called for the following topic:

3.1.7.1. EDF-2023-RA-SI-ENERENV-IPS: Innovative propulsion systems for defence applications

This topic focuses on innovative propulsion systems for defence applications (e.g., green technologies, new fuel, synthetic fuel from waste and biofuels, nanoscale propellants and hydrogen-based systems). The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. This objective is at the heart of the European Green Deal and in line with the EU's commitment to global climate action under the Paris Agreement. This objective affects also military capabilities, which progressively will have to reduce Green House Gases (GHG) emissions similarly as other economic sectors.

In order to avoid unnecessary duplications and to best complement R&D efforts already targeting civil applications, the research conducted should build on existing R&D projects from Member States, civil programmes and ongoing NATO activities, hence encouraging the efficient spinning-in of knowledge and innovative solutions to the defence sector. In addition, research activities should be in line with activities conducted by EDA (e.g. TBB⁹ on alternative fuels and drive/propulsion system) in this area. Furthermore, research efforts

⁹ Technology Building Block

should be adapted to defence requirements and applications while also contributing to spin-off knowledge and innovative solutions to the civil sector.

In order to best complement R&D efforts already targeting civil applications and to encourage the efficient spinning-in of knowledge and innovative solutions to the defence sector, this topic will provide funding for add-on research to adapt solutions originally developed for civil applications to defence requirements. It targets proposals that drive forward or integrate results of projects funded under EU programme calls with a focus on civil applications and under the provision that the applicants have the necessary rights to access and commercialise the results of the precursor project.

Targeted types of activities: Generating and integrating knowledge, studies and design.

The proposals need to build upon or integrate results that have been achieved within one or several projects funded under a EU programme call with a focus on civil applications and for which applicants will have the necessary rights to use and commercialise the results.

Indicative budget: EUR 25 000 000 for this topic under the call EDF-2023-RA-SI.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.8. Materials and components (MATCOMP)

This *category of actions* will be addressed through two *calls for proposals* in 2023, EDF-2023-RA-SI and EDF-2023-DA, and proposals will be invited for each of the related two topics, including the one for actions to be implemented under indirect management as referred to in section 3.3.

3.1.8.1. EDF-2023-RA-SI-MATCOMP-HPM: High-performance materials

This topic on high-performance materials focuses on materials and structural solutions that exhibit the potential to withstand extreme thermal loads, while remaining lightweight and fulfilling key performance requirements for specific defence applications, such as ballistic performance, erosion resistance, transparency in certain frequency ranges. Concerning the resistance to high temperatures, the scope encompasses materials for the outer layer, but also insulation materials and ballistic protection that withstand temperatures encountered in hypersonic environments.

In order to best complement R&D efforts already targeting civil applications and to encourage the efficient spinning-in of knowledge and innovative solutions to the defence sector, this topic will provide funding for add-on research to adapt solutions originally developed for civil applications to defence requirements. It targets proposals that drive forward or integrate results of projects funded under EU programme calls with a focus on civil applications and under the provision that the applicants have the necessary rights to access and commercialise the results of the precursor project.

Targeted types of activities: Generating and integrating knowledge, studies and design.

The proposals need to build upon or integrate results that have been achieved within one or several projects funded under a EU programme call with a focus on civil applications and for which applicants will have the necessary rights to use and commercialise the results.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-RA-SI.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.9. Air combat (AIR)

This *category of actions* will be addressed through one *call for proposals* in 2023, EDF-2023-DA, and proposals will be called for the following two topics:

3.1.9.1. EDF-2023-DA-AIR-STFS: Smart technologies for next generation fighter systems

This topic aims at studies and development regarding key technologies supporting the next generation of military integrated avionics (NG-MIMA), which could be incorporated in various military platforms, manned or unmanned, fixed or rotary wings. It would bring about proofs of concept and demonstrations of such key technologies, paving the way for future developments, notably in relation with next generation fighter systems.

Targeted types of activities: Studies and design, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 30 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.9.2. EDF-2023-DA-AIR-SPS: Self-protection systems

In order to increase aircraft survivability in semi-permissive or even non-permissive environments, self-protection systems (SPS) are crucial to efficiently face a wide, heterogeneous and evolving spectrum of hostile and directly threatening systems of surveillance, as well as prioritise risks in the operational area and select the proper reaction mode through a network of distributed capabilities exploiting sensor nodes of various platforms.

This topic aims at developing a new generation of integrated self-protection system, designed to protect both fixed and rotary wing, combat and non-combat platforms, with very high efficiency, in view of allowing the usage of these platforms for mission accomplishment even in contested airspace.

This topic aims to complement activities requested under the call EDIDP-ACC-SPS-2020 *Self-protection systems for fixed and rotary wing aircraft*.

Targeted types of activities: Design, system prototyping and testing, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 33 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.10. Air and missile defence (AIRDEF)

This *category of actions* will be addressed in 2023 through one *call for proposals*, namely EDF-2023-DA and a direct award, and proposals will be invited for each of the related two

topics, including the one for actions to be implemented under indirect management as referred to in section 3.3.

3.1.10.1.EDF-2023-DA-AIRDEF-CUAS: Counter-UAS capabilities

This topic aims at developing both hardware or software modules for a comprehensive, mobile and effective solution to counter a wide range of UAS, including swarms of UAS, which would include an enhanced multi-sensor arrangement with distributed sensor systems, new machine learning methods (*e.g.*, for scene interpretation and semantic segmentation) and a multi-effector system.

This topic aims to complement activities requested under the call EDIDP-CUAS-2020 *Counter Unmanned Air Systems (UASs) capabilities*.

Targeted types of activities: Design, system prototyping, testing and qualification, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 43 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.11. Ground combat (GROUND)

This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-DA, and proposals will be called for the following two topics:

3.1.11.1.EDF-2023-DA-GROUND-MBT: Main battle tank platform systems

The main battle tank remains an essential backbone for high intensity land-based operations. This topic would address studies and design for the upgrade of current and the development of future main battle tank technologies, including enabling and green technologies, leading to a system level capable of outstanding operational effectiveness and mission success in all possible future scenarios.

Targeted types of activities: Studies and design, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.11.2.EDF-2023-DA-GROUND-IFS: Long-range indirect fire support capabilities for precision and high efficiency strikes

The availability of mobile precision systems able to provide the necessary high degree of accuracy and efficiency, avoiding widespread collateral damage, and reducing exposure of friendly forces is a priority for Member States' armed forces. This topic addresses the development of enhanced European indirect fire capabilities through the upgrade of current and development of next generation indirect fire capabilities (both self-propelled gun systems and rocket launchers) as well as the associated modular guided ammunitions.

This topic aims to complement activities requested under the call EDIDP-NGPSC-2020 on *Upgrade of current and development of next generation ground-based precision strike capabilities*.

Targeted types of activities: Studies, design and system prototyping, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 27 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.12. Force protection and mobility (PROTMOB)

This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-RA, and proposals will be called for the following two topics:

3.1.12.1.EDF-2023-RA-PROTMOB-DEXPLO: Demonstrators and technologies to defeat Unexploded Explosives Ordnances (UXO) and Improvised Explosive Devices (IED)

Force protection is a critical capability for all operational domains of the Member State armed forces. In asymmetrical situations, Improvised Explosive Devices (IEDs) and Unexploded Explosives Ordnance (UXOs) continue to pose a threat towards Member State armed forces. This research topic aims at developing technologies to detect, identify and neutralise UXOs and concealed IEDs (*e.g.*, buried, in a vehicle, left-behind or on a person) in complex and diverse environments.

Targeted types of activities: Generating knowledge, integrating knowledge and studies, not excluding downstream activities eligible for research actions.

Indicative budget: EUR 25 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.12.2.EDF-2023-RA-PROTMOB-SATOC: Strategic air transportation of outsized cargo

Strategic air transportation of outsized cargo (SATOC) is a core capability for rapid military projection over long distances and mission support worldwide. All operations carried out so far have always had to fall back on this important capability for deployment and later for sustainment. Beyond their pure military role, SATOC aircrafts are also key assets for a better civil support for EU-internal needs, with critical and essential contribution to fast logistical support over high distances, disaster relief and fast general crises response.

However, there is currently no service provider in the world who has the appropriate capability to support the Member State needs, hence this topic aims at studying the possibility of a future aircraft development or contractor support.

Targeted types of activities: Studies, not excluding upstream and downstream activities eligible for research actions.

Indicative budget: EUR 20 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.13. Naval combat (NAVAL)

This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-DA, and proposals will be invited under the related topic for an action to be implemented under indirect management as referred to in section 3.3.

3.1.14. Underwater warfare (UWW)

Recent hostile activities against critical underwater infrastructure have underlined that naval capabilities for the protection of seabed infrastructures and for freedom of action remain key aspects of naval capabilities and constitute a cornerstone of maritime security for the EU. This requires enhanced underwater situational awareness and engagement capabilities. Solutions utilising unmanned systems with autonomous features are foreseen to be a technological multiplier in this area. These include operational features bringing forth significant synergies with the EU-wide need for enhanced protection of critical underwater infrastructure. This *category of actions* will be addressed through one *call for proposals* in 2023, namely EDF-2023-DA, and proposals will be called for each of the following two topics:

3.1.14.1. EDF-2023-DA-UWW-ASW: Unmanned anti-submarine and seabed warfare

The topic targets the future antisubmarine and seabed warfare systems based on unmanned platforms, and will develop an advanced antisubmarine and seabed warfare system. The development should enable better monitoring of the underwater domain and securing the ability to act under the surface, including engagement operations against a variety of underwater threats. The outcome should enable capabilities for securing critical seabed infrastructures as well as capabilities combating underwater swarms consisting of heterogeneous unmanned underwater vehicles (UUVs).

Targeted types of activities: Design and system prototyping, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 45 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.14.2. EDF-2023-DA-UWW-MCMC: Mine counter-measures capabilities

The topic aims to push ahead the technological developments and solutions for the first phase of the mine countermeasures (MCM) stand-off concept. It needs to consider new underwater threats and build a system-of-systems with evolving and scalable toolboxes and enhanced intelligent platforms. The challenging objective consists in augmenting autonomous systems for achieving targets that are still out of reach (drifting mines, floating mines) while developing innovative solutions for accelerating the detection and identification of all type of mines. The topic should also address solutions for greater operational ranges of MCM and optimised intelligent mission management.

Targeted types of activities: Design and system prototyping, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 45 000 000 for this topic under the call EDF-2023-DA.

Indicative number of proposals to be funded: One proposal is to be funded for this topic. However, depending on the quality of the submitted proposals and the available budget, more than one proposal may ultimately be funded for this topic.

3.1.15. Simulation and training (SIMTRAIN)

This *category of actions* will not be addressed in 2023.

3.1.16. Disruptive technologies (DIS)

This *category of actions* will be addressed through two *call for proposals* in 2023, EDF-2023-LS-RA-DIS and EDF-2023-RA, and proposals will be called for each of the following two topics:

3.1.16.1. EDF-2023-RA-DIS-LDEW: Laser-based directed energy weapons

Laser-based Directed Energy Weapons (LDEW) systems have the potential to change the course of future conflicts, particularly when facing evolving conventional and unconventional threats where there is an emerging need for highly-precise, targeted and agile weapon systems. LDEW systems provide a cost-effective answer to all these capability needs.

Ongoing EU-funded research has paved the way to the design and building of a EU high-power laser effector to be integrated in military applications once mature.

Nevertheless, some further research activities should be performed in order to increase the level of maturity of some of the most critical LDEW technologies and subsystems to ensure strategic autonomy and security of supply in this critical domain.

Targeted types of activities: Generating knowledge, integrating knowledge and studies, not excluding downstream activities eligible for research actions.

Indicative budget: EUR 25 000 000 for this topic under the call EDF-2023-RA.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

3.1.16.2. EDF-2023-LS-RA-DIS-NT: Non-thematic research actions targeting disruptive technologies for defence

The proposals should primarily consist of activities aiming to create, underpin and improve disruptive technologies that can achieve significant effects in the area of defence.

The proposals must substantiate their disruptive impact and could address disruptive technologies in any area of interest for defence, such as, but not limited to, the following ones:

- Blockchain applications (e.g. for Identification of Friend or Foe)
- Tools and applications improving cybersecurity talents screening
- Artificial intelligence and robotic autonomous systems
- Future naval platform control and management
- Smart damage control related to future naval platforms
- Ship signature management
- Secure and reliable underwater communication solutions and interfaces (radiofrequency, acoustic, optic or others)

- Measurement and monitoring of physiological and cognitive state of soldiers
- Solutions for mechanical and “green” chemical recycling of waste of soldier individual equipment (uniforms, helmets, boots, rucksacks, plastic elements, harness, etc.)
- Concepts and corresponding technologies to ensure a safe water reuse throughout the entire water cycle of a deployable camp or a deployed combat group
- Synthetic fuel production from waste and biomass for military use

Targeted types of activities: Generating knowledge, not excluding downstream eligible activities for research actions.

Indicative budget: EUR 16 000 000 for this topic under the call EDF-2023-LS-RA-DIS

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

Range of financial contribution of the EU per proposal: The requested funding should not exceed EUR 4 000 000.

3.2. Actions to be funded through grants but not related to the categories of actions

Three calls for proposals not related to the categories of actions will be launched in 2023:

3.2.1. EDF-2023-LS-RA-SMERO: Call for proposals dedicated to SMEs and research organisations

- **Targeted type of actions:** Research actions (dedicated to SMEs and research organisations).
- **Form of funding:** Lump sum grants following the call for proposals.
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation. Members of the consortium need to be SMEs (as defined in Commission Recommendation 2003/361/EC) or research organisations. The coordinator of the consortium needs to be an SME. The budget allocated to research organisations cannot exceed 40% of the total requested grant amount.
- **Indicative budget for the call:** EUR 36 000 000 under this call for one call topic.

3.2.1.1. EDF-2023-LS-RA-SMERO-NT: Non-thematic research actions by SMEs and research organisations

This topic addresses innovative defence technologies, materials and solutions, including those that can improve readiness, deployability, reliability, safety and sustainability of EU forces in the entire spectrum of tasks and missions, for example in terms of operations, equipment, infrastructure, basing, energy solutions, new surveillance systems.

The proposals could address any subject of interest for defence, such as, but not limited to, the following areas:

- Blockchain applications (e.g. for Identification of Friend or Foe)

- Tools and applications improving cybersecurity talents screening
- Future naval platform control and management
- Artificial intelligence and robotic autonomous systems
- Smart damage control related to future naval platforms
- Ship signature management
- Secure and reliable underwater communication solutions and interfaces (radiofrequency, acoustic, optic or others)
- Measurement and monitoring of physiological and cognitive state of soldiers
- Solutions for mechanical and “green” chemical recycling of waste of soldier individual equipment (uniforms, helmets, boots, rucksacks, plastic elements, harness, etc.)
- Concepts and corresponding technologies to ensure a safe water reuse throughout the entire water cycle of a deployable camp or a deployed combat group
- Synthetic fuel production from waste and biomass for military use

Successful SME beneficiaries may be offered Business Coaching, to reduce the time of bringing the results to the next phase, *e.g.*, development.

Targeted types of activities: Any activities eligible for a research action. However, proposals must not be limited to studies.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

Range of financial contribution of the EU per proposal: The requested funding should not exceed EUR 4 000 000.

3.2.2. EDF-2023-LS-DA-SME: Call for proposals dedicated to SMEs

- **Targeted type of actions:** Development actions (dedicated to SMEs).
- **Form of funding:** Lump sum grants following the call for proposals.
- **Targeted type of applicants:** Any eligible consortium as defined in Articles 9 and 10(4) of the EDF Regulation. Members of the consortium need to be SMEs (as defined in Commission Recommendation 2003/361/EC).
- **Indicative budget for the call:** EUR 36 000 000 under this call for one call topic:

3.2.2.1. EDF-2023-LS-DA-SME-NT: Non-thematic development actions by SMEs

This topic addresses innovative defence products, solutions, materials and technologies, including those that can improve readiness, deployability, reliability, safety and sustainability of EU forces in the entire spectrum of tasks and missions, for example in terms of operations, equipment, infrastructure, basing, energy solutions, new surveillance systems.

The proposals could address any subject of interest for defence, such as, but not limited to, the following areas:

- Blockchain applications (e.g. for Identification of Friend or Foe)
- Tools and applications improving cybersecurity talents screening

- Future naval platform control and management
- Artificial intelligence and robotic autonomous systems
- Smart damage control related to future naval platforms
- Ship signature management
- Secure and reliable underwater communication solutions and interfaces (radiofrequency, acoustic, optic or others)
- Measurement and monitoring of physiological and cognitive state of soldiers
- Solutions for mechanical and “green” chemical recycling of waste of soldier individual equipment (uniforms, helmets, boots, rucksacks, plastic elements, harness, etc.)
- Concepts and corresponding technologies to ensure a safe water reuse throughout the entire water cycle of a deployable camp or a deployed combat group
- Synthetic fuel production from waste and biomass for military use

Successful SME beneficiaries may be offered Business Coaching, to reduce the time of bringing the results to the next phase of development.

Targeted types of activities: Any activities eligible for a development action. However, the proposals must address at least one activity among design, system prototyping, testing, qualification, certification and increasing efficiency.

Indicative number of proposals to be funded: Several proposals may be funded for this topic.

Range of financial contribution of the EU per proposal: The requested funding should not exceed EUR 6 000 000.

3.3. Actions implemented under indirect management

The following three topics will lead to actions to be implemented under indirect management:

3.3.1.1. EDF-2023-DA-MATCOMP-MJR-CBDIN: *Technologies and processes for maintenance, joining and repair through an innovation test hub*

This topic will support a cross-border defence innovation network for material technologies with the aim of propelling technologies across the valley of death by allowing them to be tested and qualified. The objective is to define and set-up a test platform and, if necessary, adequate test protocols adapted to defence applications for materials technologies. Those technologies include multi-material and multi-functional structures, joining technologies, repair methods and maintenance methods, such as inspection technologies. As an enabler topic, it should improve opportunities for various actors, including those not active in the defence sector before, to adapt and certify innovative material technologies for defence applications and access business opportunities in the defence sector. To achieve this goal, the action will include financial support to third parties. The test platform will be accessible to beneficiaries of financial support to third parties within the grant period to demonstrate the performance of their technology and support their maturation. Advances in repair and maintenance technologies will not only improve the performance and cost efficiency of defence equipment but also reduce its environmental footprint throughout its life-cycle.

Management mode: Action implemented in indirect management by the European Defence Agency (EDA).

Form of funding: Contribution Agreement

Entrusted tasks:

Implementation of actual cost grants following a competitive call.

Targeted types of activities: Integrating knowledge, studies, design, system prototyping, testing, qualification, not excluding downstream activities eligible for development actions.

Indicative budget: EUR 31 050 000 for this topic under the call EDF-2023-DA, including up to EUR 1 050 000 for remuneration of the entrusted entity.

3.3.1.2. EDF-2023-DA-NAVAL-MMPC: Modular and multirole patrol corvette

This topic is the follow-up and complements the same topic addressed in the EDF 2021 work programme under the call *multirole and modular offshore patrol vessel* (EDF-2021-NAVAL-D). It aims, this time, to complete the Critical Design Review and launch prototyping and testing activities.

Management mode: Action implemented in indirect management by the Organisation Conjointe de Coopération en Matière d'Armement / Organisation for Joint Armament Cooperation (OCCAR).

Form of funding: Contribution Agreement.

Entrusted tasks:

Implementation of actual cost grants following a competitive call.

Targeted types of activities: Studies, design, system prototyping and testing, not excluding upstream and downstream activities eligible for development actions

Indicative budget: EUR 156 500 000 for this topic under the call EDF-2023-DA, including up to EUR 2 000 000 for the remuneration of the entrusted entity.

3.3.1.3. EDF-2023-DA-DS-AIRDEF-EATMI: Endo-atmospheric interceptor – concept phase

In respect of exceptional and duly substantiated emergencies, Article 195 (b) of the Financial Regulation¹⁰ provides for the possibility that grants may be awarded without a call for proposal.

Scope of the action to be awarded without a call for proposal

The objective is to prepare the ground for defeating matrealising, fast increasing post-2030 threats such as manoeuvring ballistic missiles, hypersonic cruise missiles or hypersonic glide vehicles, the countering of which requires a high-speed and very early reconnaissance C2 system as well as a highly responsive and effective interception system. The rapid development of such a capability constitutes an urgent need and would offer the opportunity to anchor in Europe the related technologies and materials. It should be seen as the EU contribution complementing the NATO Ballistic Missile Defence (BMD).

¹⁰ Regulation (EU) 2018/1046.

The grant will cover the concept phase of a European interceptor, encompassing e.g. a new aerodynamic and actuator system for high manoeuvrability, highly agile guidance concepts, sensor systems able to operate in different air levels, etc.

Justification for direct award

Since the EDF Work Programme 2021 has been adopted in June 2021, the security conditions at the borders of the EU have rapidly and dramatically changed with the unjustified Russian military aggression against Ukraine on 24 February 2022, in particular in regard of the reported use of Russian hypersonic missile capabilities against targets on the territory of Ukraine.

The likelihood that this kind of weapon would become an ever more acute and challenging threat to the EU territory has never been that high. Therefore, the EU urgently needs to reinforce and further secure the European technological and industrial capabilities to design, develop and manufacture interceptors in order to address high-level performance missiles threats, and in particular hypersonic missiles.

Moreover, multilayer Air and Missile Defence has been identified in the Defence and Investment Gap Analysis as one of three most urgent capability gaps that should be addressed by the European defence industry, as the security of the EU and its citizens cannot exclusively rely on products developed and produced outside the EU, resulting in a technological dependency on third countries and/or third country entities.

Against this new background, the EU must urgently mobilise, from the outset, all its industrial competencies, starting with tapping the full spectrum of their respective conceptual and technological thinking in view of paving the way towards, and promoting the swift and successful development of a single, fit-for-purpose European hypersonic missile interceptor system.

As a consequence, in addition to the proposal selected for funding following the EDF calls for proposals 2021, there is a critical and urgent need for a dual sourcing of the preliminary studies for this kind of capability, in particular to broaden the scope of the investigation from a technological and conceptual angle.

With such a dual sourcing, all the European actors with specific technical competences and high degree of specialisation on this strategic capability will be mobilised, with a view to ensuring that the optimal combination of all such competences will result in the best possible single capability development project at the subsequent stage.

The dual sourcing logic will both greatly stimulate results-oriented competition in Europe and strengthen the EU's resilience by ensuring that two different approaches implying a broader technological and conceptual thinking, will be studied in parallel, thereby increasing the possibility for all European actors and competences to contribute to the emergence of the best technological approach and solution and to speed up its materialisation in a fit-for-purpose European capability in the future, including through possible follow-up actions in the context of the EDF.

Given the particular urgency of successfully developing and making available the capacity at issue in the shortest possible timeframe, a direct award is rendered necessary and justified by the dual sourcing logic. It is imperative that the further development stages that will follow the concept study phase be launched without any delay. In that respect, and given the incompressible lead times that are inherent to the development of complex armament systems, only a direct award can ensure that the dual sourcing materialises as soon as possible thanks

to an alignment of the time horizon of the two projects, so that it does not delay the overall development process, by ensuring that the two projects will deliver their results within the same timeframe.

The HYDIS proposal, which has been specifically defined in the context of the TWISTER PESCO project, includes the only set of beneficiaries throughout the EU able to manage the envisioned second study in the shortest possible timeframe.

This is established, first, by the fact that the two proposals submitted in response to the 2021 call already include all the few key European industrial actors who have the necessary technical expertise in this highly specialised field of missile development, and hence the capacity to carry out the requested conceptual work. Second, the other proposal (EU HYDEF) has already been selected for funding and therefore already constitutes the other leg of the dual sourcing. Third, in view of its early initiation in the context of, and as a result of TWISTER - the PESCO that has embodied from the beginning the European ambition to develop the capability at issue and that gathered until 2021 all the member States and industrial actors pursuing such ambition, HYDIS is manifestly today the sole industrial consortium capable of carrying out, in the imparted time frame, the concept study that will, together and in parallel to the work conducted by EU HYDEF, ensure the reality and swift materialisation of the requisite dual sourcing approach.

In sum, the proposed award will also ensure that besides the already selected action, all the efforts already deployed in the context of TWISTER will be followed-up and, through and thanks to the dual sourcing logic, contribute to secure the materialisation of the the subsequent development phases. Moreover, the solid track record and strong industrial culture and specialisation of the consortium means that although pursuing the same objective as that of EU HYDEF, it is bound to deliver findings that will be conceptually and possibly technologically different from those of EU HYDEF, thereby ensuring a potential of complementarity in terms of future solutions to be further investigated on the occasion of the subsequent development phases to be organised under the EDF.

As concerns possible follow-up activities related to the development of an endo-atmospheric interceptor under the Fund, an appropriate framework and solutions will be sought in view of a smooth and timely convergence of the awarded projects and consortia into the pursuance of a single capability ambition at the subsequent stage.

Targeted type of action: Development action

Beneficiaries: MBDA France, ArianeGroup SAS, GE AVIO srl, AVIO S.p.A., C.I.R.A ScPA (Centro Italiano di Ricerca Aerospaziale), Deutsches Zentrum für Luft- und Raumfahrt, Fokker Aerostructures BV, LYNRED, MBDA Deutschland GmbH, MBDA Italia S.p.A., OHB System AG, Office National d'Etudes et de Recherches Aerospatiales, Thales Nederland B.V., Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek (TNO)

Management mode: Action implemented in indirect management by the Organisation Conjointe de Coopération en Matière d'Armement / Organisation for Joint Armament Co-operation (OCCAR).

Form of funding: Contribution Agreement.

Entrusted tasks:

Implementation of an actual cost grant following a direct award.

Targeted types of activities: Studies, not excluding upstream and downstream activities eligible for development actions.

Indicative budget: EUR 81 500 000 to support this topic, including up to EUR 1 500 000 for the remuneration of the entrusted entity.

3.4. Other actions

EDF outreach, IT systems and studies

- As referred to in Article 32(3) of the Regulation (EU) 2021/697 (EDF Regulation), EDF outreach actions will contribute to communication activities on the political priorities related to the EDF, dissemination activities, matchmaking events, awareness-raising activities. EU Member States and EDF associated countries (Norway), as well as the recipients of EDF funding as referred to in Article 32(1) of the Regulation, should aim at implementing similar communication efforts.
- Development and support of IT systems adapted to EDF specificities, including a contract for the website activities of the European Network of Defence-related Regions.
- EDF contribution to a study on synergies between the EDF and EU space policy as referred to in the horizontal part of the 2023-2024 Work Programmes of the Union Space Programme
- Studies related to the EDF interim evaluation as referred to in Article 29 of the EDF Regulation.

Form of funding	Public procurements
Indicative budget	EUR 1 020 981

External expertise and audits

- Recruitment of external expertise necessary for the evaluation of proposals submitted following the EDF calls for proposals: contracts of remunerated experts referred to in Article 237 of the Financial Regulation;
- Cost arising for the performance of the audits referred to in Article 30 of the EDF Regulation (contracts).

Form of funding	Contracts
Indicative budget	EUR 1 300 000

Indirect management

- Remuneration of entrusted entities in case of change in the management mode for specific actions, following the evaluation of the proposals submitted.

Form of funding	Contribution agreements
Indicative budget	EUR 1 600 000

Business Coaches in the European Defence Fund

Small and medium-sized enterprises (SMEs) play a role in achieving more innovative solutions. To provide an easy entrance into participating in the European Defence Fund, non-thematic calls focused on SMEs have been introduced (EDF-2023-LS-RA-SMERO and EDF-2023-LS-DA-SME). To reduce the time of bringing the results from the SME-specific actions to the next phase, whether the next phase being development or the market, the Commission will provide business coaching to the selected SME entities under these calls. This action will support:

- The setting up of a pool of experts that can provide targeted business coaching;
- A mechanism for matching between the skills offered by the coaches, the requirements for coaching by the SME, and the actual assignment of the coaches.

In addition, such business coaching will also be proposed to SMEs involved in the non-thematic topic EDF-2023-LS-RA-DIS-NT.

Form of funding	Public procurement
Indicative budget	EUR 1 200 000

These awareness raising activities are referred to in Article 32(3) of the EDF Regulation.

Defence equity facility under InvestEU for SMEs and Mid-Caps

The lack of risk capital in the EU for SME or Midcaps developing innovative defence technologies hampers their growth capacity. This market failure has been underlined already in the conclusions of the expert group on the EDF Financial toolbox. In order to tackle this market failure, the “Roadmap on critical technologies for security and defence” released by the Commission on 15 February 2022 announced the creation of a defence innovation scheme, including the establishment of a defence investment blending facility under InvestEU.

The newly established facility will allow the Commission to guarantee equity investments made by private funds into innovative and strategic defence SMEs. The facility will allow the EU, through the European Investment Fund (EIF), to financially support private funds investing in innovative and strategic defence SMEs across the EU. The facility is without prejudice to EIF/European Investment Bank (EIB) policy and guidelines. This support will be made through direct investments in the funds themselves and crowding-in additional investors through signalling effects associated to the EIF’s investment. It would be created by a “blending operation” as referred to in Article 8.3 of the EDF Regulation and implemented, in indirect management, by the EIF according to InvestEU regulation and investment guidelines.

Enabling a better access to equity funding for innovative defence SMEs and mid-caps would support their growth and finally benefit to the innovativeness of the European defence technological and industrial base (EDTIB). It will also reduce their exposure to non-EU investors and benefit to the EU’s strategic autonomy, in line with EDF’s eligibility criteria. The creation of this facility will send a positive message to private investors on the attractiveness of the defence sector within the EU.

A global contribution of the European Defence Fund of EUR 100 million over the period 2022-2027 is expected, with a contribution of EUR 20 million in 2023. The European Investment Fund will be contributing with its own resources. Financial intermediaries selected by EIF and entrusted with the funds will have to invest a minimum amount in specifically defence-related SMEs, to reach a global volume of EUR 350 million.

The Guarantee Agreement between the Commission and the European Investment Fund will define the terms and conditions according to which (1) The EIF will select financial intermediaries (private funds); (2) The financial intermediaries will implement equity operations. In line with eligibility conditions of the EDF, both financial intermediaries and final beneficiaries will have to be established in the EU and EDF associated countries (Norway) and not controlled by non-associated third-countries entities. Final beneficiaries will also be subject to limitations on the transfer or exclusive licensing of their technology to non-EU and non-associated third-countries entities.

The InvestEU guarantee agreement mirrors the categories of activities of EDF’s annual work programme, ensuring that supported SMEs are relevant to the objective of the programme, and that the competitiveness of the EDTIB is supported.

Form of funding	Blending operations
Indicative budget	EUR 20 000 000

European Defence Fund Hackathon event

Hackathons are events where individuals come together and form teams to develop ideas or solutions during a limited time. Hackathons may help to discover innovative solutions for defence capability and technology needs. They have the potential to increase visibility of defence needs, reach out to innovators, entrepreneurs and researchers who are not yet familiar with the EU Member States and Norway defence challenges and requirements, but also with the defence industry. Hackathon topics will be selected in alignment with political priorities related to the EDF. At least one EDF hackathon event will be organised per year over the period 2024-2027.

Form of funding	Public procurement
Indicative budget	EUR 600 000

4. INDICATIVE BUDGET FOR 2023

Reference of the operational budget lines: 13.03 for Research and 13.02 for Development

Union actions	Total budget and percentage of 2023 appropriations					
	Research		Development		TOTAL	
- Grants*	EUR 266 000 000	83,2%	EUR 491 500 000	76,7%	EUR 757 500 000	78,9%
*Among which:						
<i>benefitting the cross-border participation of SMEs</i>	<i>EUR 36 000 000</i>	<i>13,5%</i>	<i>EUR 36 000 000</i>	<i>7,3%</i>	<i>EUR 72 000 000</i>	<i>9,5%</i>
<i>supporting disruptive technologies for defence</i>	<i>EUR 41 000 000</i>	<i>15,4%</i>			<i>EUR 41 000 000</i>	<i>5,4%</i>
<i>for grants implemented under indirect management, incl. a direct award</i>			<i>EUR 264 500 000</i>	<i>53,8%</i>	<i>EUR 264 500 000</i>	<i>34,9%</i>
- Framework partnership agreement	EUR 1 300 000	0,4%			EUR 1 300 000	0,1%
- Prizes						
- Public procurement ¹¹	EUR 906 981	0,3%	EUR 1 814 000	0,3%	EUR 2 720 981	0,3%
- Blending operations	EUR 7 000 000	2,2%	EUR 13 000 000	2,0%	EUR 20 000 000	2,1%
- Other actions ¹²	EUR 1 924 000	0,6%	EUR 5 626 000	0,9%	EUR 7 550 000	0,8%
- Financing Decision 2023 part 1	EUR 42 500 000	13,3%	EUR 129 000 000 ¹³	20,1%	EUR 171 500 000	17,9%
TOTAL	EUR 319 630 981	33,3%	EUR 640 940 000	66,7%	EUR 960 570 981	100,0%
<i>Among which contribution from Norway</i>	<i>EUR 8 524 000</i>		<i>EUR 17 093 000</i>		<i>EUR 25 617 000</i>	

Appendix 2 to this work programme is providing detailed figures per *category of actions*.

Appendix 3 to this work programme is providing detailed figures per *call for proposals*.

Appendix 4 to this work programme is providing a multiannual indicative budget summary for each *category of actions*.

¹¹ Costs arising from business coaching, EDF outreach activities, corporate information technology system, and studies, as well as from organisation of EDF hackathons.

¹² Costs arising from evaluation and audit activities, as well as a provision for costs that may arising from changes of management mode for specific actions to be decided at the time of the award.

¹³ Taking into account budget left after the implementation of the EDF calls for proposals for 2021.

5. SUMMARY INFORMATION AND FUNDING PRINCIPLES

Summary information

In 2023, the Commission will run the following actions:

- 7 competitive calls for proposals, among which 5 to support research actions and 2 to support development actions, and one direct award
- One Specific Grant Agreement – SGA (research action)
- Three development actions will be implemented under indirect management through contribution agreements to be signed with the designated entrusted entities.

Grants will be awarded to consortia after the publication of calls for proposals.

Funding principles

Pursuant to Article 13 of the EDF Regulation, maximum funding rates that will apply to eligible costs of funded actions will be determined for each activity covered by the action and will be composed of:

- a baseline funding rate (see **Table 1** below);
- an increase in the baseline funding rate ('bonus') where conditions are met (see **Table 2** below).

The overall increase in the baseline-funding rate following the application of the increase of funding rates listed in Table 2 cannot exceed 35% of the total eligible costs of the activity.

The financial assistance of the EU provided under the Programme including the increased funding rates cannot exceed the values provided in **Table 3**.

Indirect eligible costs shall be determined by applying a flat rate of 25% of the total direct eligible costs, excluding direct eligible costs for subcontracting and financial support to third parties and any unit costs or lump sums that include indirect costs.

As an alternative, indirect eligible costs may be determined in accordance with the recipient's usual cost accounting practices on the basis of actual indirect costs provided that those cost accounting practices are accepted by national authorities for comparable activities in the defence domain, in accordance with Article 185 of the Financial Regulation, and that they have been communicated to the Commission by the recipient. By way of indication, this optional regime will be implemented as follows:

- Before the signature of the grant agreement:
 - Usual accounting practices of the opting applicant to calculate its indirect costs to be described in detail in the application;
 - National authority to certify that these accounting practises are accepted at national level for comparable activities in the defence domain;
 - The Commission to check if the indirect costs calculated by the applicant do not contain ineligible costs within the meaning of Article 186 of the Financial Regulation and will make adjustments, where applicable, for the calculation of the maximum grant amount.

- At the end of the action:
 - The opting beneficiary declares its actual indirect costs calculated following the methodology agreed ex ante;
 - Financial statement of the opting beneficiary to be accompanied by a Certificate of Financial Statement (CFS) provided by an external auditor as foreseen in the Model Grant Agreement;
 - The auditor establishing the CFS will follow the methodology agreed ex-ante to certify the amount of the actual indirect costs.
 - Possibility for the Commission to audit the actual indirect costs following the methodology agreed ex ante (internal audit service or external mandated auditors).

The necessary details and forms will be part of the call documents published by the Commission on the website of the institution.

No profit rule: In order to ensure the continuity of the development actions after the period of Union financing provided for in the grant, potential revenue to be generated by these actions will not be taken into consideration in accordance with point (a) of Article 192(3) of the Financial Regulation.

Table 1. Applicable baseline funding rates

Types of activities		Baseline funding rate	
		Research action	Development action
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies for defence, which can achieve significant effects in the area of defence	100% of eligible costs	<i>Not applicable</i>
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies	100% of eligible costs	Up to 65% of eligible costs
(c)	Studies, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solution	100% of eligible costs	Up to 90% of eligible costs
(d)	The design of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial tests for risk reduction in an industrial or representative environment	100% of eligible costs	Up to 65% of eligible costs
(e)	The system prototyping of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 20% of eligible costs
(f)	The testing of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 45% of eligible costs
(g)	The qualification of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 70% of eligible costs
(h)	The certification of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 70% of eligible costs
(i)	The development of technologies or assets increasing efficiency across the life cycle of defence products and technologies	<i>Not applicable</i>	Up to 65% of eligible costs

Table 2. Increase of funding rates (bonus) for development actions:

Condition to be fulfilled to get the corresponding bonus	Bonus (additional number of percentage points to the baseline funding rate)
PESCO bonus	
Action developed in the context of the permanent structured cooperation (PESCO)	+ 10%
SME bonus	
Proportion of eligible costs allocated to SMEs established in the EU $\geq 10\%$ (for the activity concerned)	Proportion of eligible costs allocated to non-cross-border SMEs established in the EU (up to maximum 5%) + Twice the proportion of eligible costs allocated to cross-border SMEs established in the EU
Mid-cap bonus	
Proportion of eligible costs allocated to Mid-caps established in the EU $\geq 15\%$ (for the activity concerned)	+ 10%

Table 3. Applicable maximum funding rates

Types of activities		Maximum funding rate	
		Research action	Development action
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies for defence, which can achieve significant effects in the area of defence	100% of eligible costs	<i>Not applicable</i>
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies	100% of eligible costs	Up to 100% of eligible costs
(c)	Studies, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solution	100% of eligible costs	Up to 100% of eligible costs
(d)	The design of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial tests for risk reduction in an industrial or representative environment	100% of eligible costs	Up to 100% of eligible costs
(e)	The system prototyping of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 55% of eligible costs
(f)	The testing of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 80% of eligible costs
(g)	The qualification of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 80% of eligible costs
(h)	The certification of a defence product, tangible or intangible component or technology	<i>Not applicable</i>	Up to 80% of eligible costs
(i)	The development of technologies or assets increasing efficiency across the life cycle of defence products and technologies	<i>Not applicable</i>	Up to 100% of eligible costs

APPENDIX 1: SUMMARY OF CALL TOPICS PER CATEGORY OF ACTIONS

<i>Categories of actions</i>	Research call topics	Development call topics
	15	19
<i>1. Defence medical support, CBRN, biotech and human factors</i>	EDF-2023-RA-SGA-MCBRN-MCM	EDF-2023-DA-MCBRN-FCS
<i>2. Information superiority</i>		EDF-2023-DA-C4ISR-LCOM EDF-2023-DA-C4ISR-TRPAS EDF-2023-DA-C4ISR-DAA
<i>3. Advanced passive and active sensors</i>	EDF-2023-RA-SENS-EMSP EDF-2023-RA-SENS-OPTD	EDF-2023-DA-SENS-GRID
<i>4. Cyber</i>	EDF-2023-RA-SI-CYBER-ASPT	EDF-2023-DA-CYBER-CSA EDF-2023-DA-CYBER-DAAI
<i>5. Space</i>	EDF-2023-RA-SPACE-PSA	EDF-2023-DA-SPACE-SSA
<i>6. Digital transformation</i>	EDF-2023-RA-DIGIT-HAAI EDF-2023-LS-RA-CHALLENGE- DIGIT-HLTP EDF-2023-LS-RA-CHALLENGE- DIGIT-HLTO	
<i>7. Energy resilience and environmental transition</i>	EDF-2023-RA-SI-ENERENV-IPS	
<i>8. Materials and components</i>	EDF-2023-RA-SI-MATCOMP-HPM	EDF-2023-DA-CBDIN-MATCOMP-MJR-CBDIN
<i>9. Air combat</i>		EDF-2023-DA-AIR-STFS EDF-2023-DA-AIR-SPS
<i>10. Air and missile defence</i>		EDF-2023-DA-AIRDEF-CUAS EDF-2023-DA-DS-AIRDEF-EATMI
<i>11. Ground combat</i>		EDF-2023-DA-GROUND-MBT EDF-2023-DA-GROUND-IFS
<i>12. Force protection and mobility</i>	EDF-2023-RA-PROTMOB-DEXPLO EDF-2023-RA-PROTMOB-SATOC	
<i>13. Naval combat</i>		EDF-2023-DA-NAVAL-MMPC
<i>14. Underwater warfare</i>		EDF-2023-DA-UWW-ASW EDF-2023-DA-UWW-MCMC
<i>15. Simulation and training</i>	<i>Not addressed in 2023</i>	
<i>16. Disruptive technologies</i>	EDF-2023-RA-DIS-LDEW EDF-2023-LS-RA-DIS-NT	
<i>Out of the scope of categories of actions</i>	EDF-2023-LS-RA-SMERO-NT	EDF-2023-LS-DA-SME-NT

APPENDIX 2: 2023 ANNUAL BUDGET ALLOCATIONS PER CATEGORY OF ACTIONS

Categories of actions	Budget (in M€)								
	Research		Development		Research and Development				
	Total		Total		Total				
1. Defence medical support, CBRN, biotech and human factors	40				40				
2. Information superiority			99		99				
3. Advanced passive and active sensors	42		27		69				
4. Cyber	14		46		60				
5. Space	25		100		125				
6. Digital transformation	45				45				
7. Energy resilience and environmental transition	25				25				
8. Materials and components	20		30		50				
9. Air combat			63		63				
10. Air and missile defence			123		123				
11. Ground combat			47		47				
12. Force protection and mobility	45				45				
13. Naval combat			154.5		154.5				
14. Underwater warfare			90		90				
15. Simulation and training									
16. Disruptive technologies	41				41				
Non- thematic calls for innovative and future-oriented defence solutions focused on SMEs	36		36		72				
Other actions	9,8		20,5		30,3				
TOTAL	342,8**	Among which		836**	Among which		1178,8**	Among which	
		Disruptive	SMEs		Disruptive	SMEs		Disruptive	SMEs
		41	36		-	36		41	72

** Including budget complement stemming from 2024 budget, subject to a separate financing decision.

APPENDIX 3: 2023 ANNUAL BUDGET ALLOCATIONS PER CALL FOR PROPOSALS

Call ID	Call topic ID	Budget (in M€)
<i>EDF-2023-RA**</i>	EDF-2023-RA-SENS-EMSP	22
	EDF-2023-RA-SENS-OPTD	20
	EDF-2023-RA-SPACE-PSA	25
	EDF-2023-RA-DIGIT-HAAI	20
	EDF-2023-RA-PROTMOB-DEXPLO	25
	EDF-2023-RA-PROTMOB-SATOC	20
	EDF-2023-RA-DIS-LDEW	25
<i>EDF-2023-RA-SI</i>	EDF-2023-RA-SI-CYBER-ASPT	14
	EDF-2023-RA-SI-ENERENV-IPS	25
	EDF-2023-RA-SI-MATCOMP-HPM	20
<i>EDF-2023-LS-RA-CHALLENGE</i>	EDF-2023-LS-RA-CHALLENGE-DIGIT-HTDP	18 + ceiling 6 per proposal
	EDF-2023-LS-RA-CHALLENGE-DIGIT-HTDO	7
<i>EDF-2023-LS-RA-DIS</i>	EDF-2023-LS-RA-DIS-NT	16 + ceiling 4 per proposal
<i>EDF-2023-LS-RA-SMERO</i>	EDF-2023-LS-RA-SMERO-NT	36 + ceiling 4 per proposal
<i>EDF-2023-DA**</i>	EDF-2023-DA-MCBRN-FCS	15
	EDF-2023-DA-C4ISR-LCOM	17
	EDF-2023-DA-C4ISR-TRPAS	42
	EDF-2023-DA-C4ISR-DAA	40
	EDF-2023-DA-SENS-GRID	27
	EDF-2023-DA-CYBER-CSA	20
	EDF-2023-DA-CYBER-DAAI	26
	EDF-2023-DA-SPACE-SSA	100
	EDF-2023-DA-MATCOMP-MJR-CBDIN	30
	EDF-2023-DA-AIR-STFS	30
	EDF-2023-DA-AIR-SPS	33
	EDF-2023-DA-AIRDEF-CUAS	43
	EDF-2023-DA-GROUND-MBT	20
	EDF-2023-DA-GROUND-IFS	27
	EDF-2023-DA-NAVAL-MMPC	154.5
	EDF-2023-DA-UWW-ASW	45
	EDF-2023-DA-UWW-MCMC	45
<i>EDF-2023-LS-DA-SME</i>	EDF-2023-LS-DA-SME-NT	36 + ceiling 6 per proposal
<i>EDF-2023-RA-SGA</i>	EDF-2023-RA-SGA-MCBRN-MCM	25
<i>Award without call for proposals</i>	EDF-2023-DA-DS-AIRDEF-EATMI	80

*** Including budget complement stemming from 2024 budget, subject to a separate financing decision.*

APPENDIX 4: EDF MULTIANNUAL INDICATIVE BUDGET SUMMARY PER CATEGORY OF ACTIONS

Categories of actions	2021 ⁹	2022 ¹⁴	2023 ⁹	2024	2025	2026	2027	Total	
	in M€	in M€	in M€	in M€	in M€	in M€	in M€	in M€	in %
<i>1. Defence medical support, CBRN, biotech and human factors</i>	57.80	25.00	40.00					122.80	3.76%
<i>2. Information superiority</i>	70.00	70.00	99.00					239.00	7.32%
<i>3. Advanced passive and active sensors</i>	38.00	40.00	69.00					147.00	4.50%
<i>4. Cyber</i>	37.86	70.00	60.00					167.86	5.14%
<i>5. Space</i>	49.37	150.00	125.00					324.37	9.93%
<i>6. Digital transformation</i>	68.49	50.00	45.00					163.49	5.01%
<i>7. Energy resilience and environmental transition</i>	82.84	20.00	25.00					127.84	3.91%
<i>8. Materials and components</i>	34.56	45.00	50.00					129.56	3.97%
<i>9. Air combat</i>	189.81	40.00	63.00					292.81	8.97%
<i>10. Air and missile defence</i>	100.00		123.00					223.00	6.83%
<i>11. Ground combat</i>	154.68	50.00	47.00					251.68	7.71%
<i>12. Force protection and mobility</i>	49.10	30.00	45.00					124.10	3.80%
<i>13. Naval combat</i>	103.50	130.00	154.50					388.00	11.88%
<i>14. Underwater warfare</i>		55.00	90.00					145.00	4.44%
<i>15. Simulation and training</i>		30.00						30.00	0.92%
<i>16. Disruptive technologies</i>	64.51	40.00	41.00					145.51	4.46%
<i>Undefined categories, including SME calls</i>	54.08	54.10	72.00					180.18	5.52%
<i>Other actions</i>	8.08	24.99	30.30					63.37	1.94%
TOTAL	<i>1162.68</i>	<i>924.09</i>	<i>1178.80</i>					3265.87	100,00%

¹⁴ Budget including complements using appropriations from the EDF budget for the subsequent year (top-up budget).